Field Artillery

June 1993

Deployable, Versatile, Lethal

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Field Artillery

A Professional Bulletin for Redlegs

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MAJOR GENERAL FRED F. MARTY

A Farewell Address:
Fires and the Future
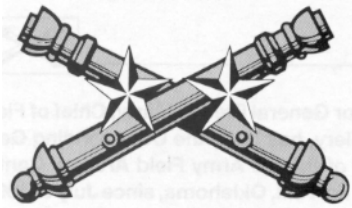
For the past two years, I've been privileged to serve as the Chief of Field Artillery. These have been dynamic and challenging times. Thanks to the close cooperation and excellent performance of the Field Artillery community, we have ratcheted up the ability and future potential of force commanders to "Fight with Fires."

Operation Desert Storm reinforced the force's confidence in the overwhelming lethality of the synchronized fire support system-of-systems. The enemy learned the unprecedented psychological effects of modern-day "Steel Rain" and the devastating accuracy of precision munitions. Our soldiers and Marines convinced their maneuver counterparts that Field Artillery is the *only* 24-hour, all-weather attack system. Field commanders validated the soundness of our doctrine, tactics, techniques and procedures. Once again, the Field Artillery was pronounced the "King of Battle" by those who witnessed its massed, accurate and awesome effects.

Yet, the future demands we not rest on our laurels. The next challenge we face may spill over from any of 40 ongoing conflicts or originate from more than 50 identified hot-spots in every region of the world. Certainly, our next potential adversary will have read the Iraqi after-action report. And the availability of sophisticated weapons to any despot with hard currency demands we continue to increase and refine our ability to fight with fires.

Historically, either firepower or maneuver has been considered predominant on the battlefield. This no longer holds true. The new edition of *FM 100-5 Operations* will hit the streets this summer, calling attention to the ascendancy of fires in modern warfighting. Given the nature of warfare today, we must treat fires and maneuver as co-equal, mutually supporting dynamics of combat power.

Technology now affords us the ability to see more of the battlefield and rapidly direct joint and combined fires throughout its depth. Our ability to attack with fires will likely become the critical factor in the combat power equation of a force projection Army.

Fires offer the commander maximum warfighting power to achieve his unchanged imperatives of accomplishing the mission and protecting the force. The fire support system contributes an integrated architecture of command and control and a complementary family of attack systems with the capability to strike simultaneously anywhere on the battlefield. The synchronized application of fire support throughout the area of operations provides the commander the opportunity to shape the tempo and structure the fight. We can hasten the enemy's disintegration by affording him no place to hide and no time to rest.
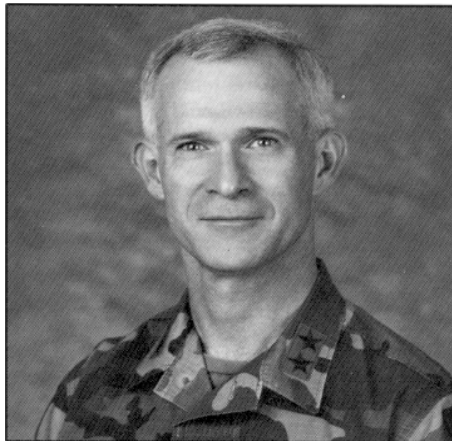
Today's Technology for Tomorrow's Battlefield. Success on tomorrow's battlefield demands we further increase our ability to fight with fires by leveraging our ever-expanding technologies to developand field systems with greater range, lethality, mobility, deployability and survivability.

Today's strategy for a force projection Army demands increased lethality for early deployers. The fielding of the M119 howitzer and development of the high-mobility artillery rocket system (HIMARS) provide a significant increase in capabilities for our early-entry forces.

The M109A6 Paladin howitzer debuted earlier this year at the National Training Center at Fort Irwin, California. Its magnificent performance provided combined arms leaders a glimpse of the tactical revolution Paladin offers our heavy forces.

Work has begun in earnest on our 21st century howitzer, the advanced Field Artillery system (AFAS), and its companion Field Artillery resupply vehicle (FARV). These carriers of leap-ahead technology will yield us a system capable of range in excess of 40 kilometers and the mobility equal to the supported maneuver force.

All these delivery systems, combined with precision and extended-range munitions currently under development, will significantly enhance the firepower advantage of tomorrow's force.

Concurrently, the fielding of our newest command and control systems, the advanced Field Artillery tactical data system (AFATDS) and the interim fire support automation system (IFSAS), will enhance our ability to provide responsive and accurate fires. For the first time since we all used "charts and darts," these systems will place the entire Field Artillery community on a common automated fire direction "sheet of music."

Stand-Out Redlegs. Even the ever-increasing sophistication and lethality of our weapons cannot replace the human element in warfare. Today's Field Artillery leaders and soldiers stand out as the *finest* this nation has ever known. The proof-positive lies in your magnificent performance in the sands of Southwest Asia, in your participation in grueling simulated warfare at the Combat Training Centers (CTCs) and by your day-to-day vigilance to maintain combat readiness.

You are the 13F humping the 100-pound ruck at the Joint Readiness Training Center at Fort Chaffee, Arkansas; the gunner who comes in at zero mils on every position occupation; or the battery commander conducting a training assessment. Your dedication and commitment to excellence provide the heartbeat of our ability to fight with fires.

But the high standards, cohesion and skill levels artillerymen possess haven't come about by accident. They were nurtured by tough, demanding training conducted in motor pools, gun parks and at CTCs, as well as at institutions such as the Field Artillery School and NCO academies. The quality of this rigorous, skill-and mission-oriented training conducted to standard under the experienced eye of capable leaders ensures our ability to provide

fire support on the complex joint and combined battlefield of tomorrow.

Challenge for the Future. In parting, I challenge all artillerymen to look to the future. We face many demanding and complex issues. We must never lose sight of our mission: providing the commander the synchronized, devastating fires necessary to accomplish the mission and protect the force. What we do today prepares us for tomorrow—and there's no time out from readiness. In the words of the Chief of Staff of the Army General Gordon R. Sullivan, "remaining trained and ready is a journey, not a destination."

I sincerely thank all of you—soldiers and Marines; active, reserve and retired; military and civilians—for your untiring support and loyalty both to me in my duties as the Chief of Field Artillery and to the initiatives of the Field Artillery community. Through your hard work, demonstrated abilities and willingness to go beyond the routine requirements of your duties, the United States Field Artillery stands alone as the finest in the *world*. Please give the same measure of support to the new Chief of Field Artillery, Major General John A. Dubia, who assumes his new duties this month.

The term "Redleg" represents a commitment to excellence second to none. I challenge each of you to remain committed to the high standards and dedication our profession of arms demands. Our tactical and technical competence at fighting with fires provides the force commander an overwhelming edge in combat power—*On Time, On Target.*

Major General Fred F. Marty, Chief of Field Artillery, has been the Commanding General of the US Army Field Artillery Center and Fort Sill, Oklahoma, since July of 1991. Major General John A. Dubia, most recently serving as the Director of the Officer Personnel Management Directorate of the US Total Personnel Command in Alexandria, Virginia, takes command this month.

Response to "The Myth of the Well-Rounded Artilleryman" and "Cannoneers with Hairy Ears"

Field Artillery should be congratulated for the diversity of articles and comments it publishes. Captain Robert P. Smith's letter to the editor, "The Myth of the Well-Rounded Artilleryman," and Colonel (Retired) Robert B. Partridge's article, "Cannoneers with Hairy Ears—Serving with the Horse-Drawn Artillery," both in the February 1993 edition, are cases in point.

Colonel Partridge passionately describes life as he experienced it in the 1930s artillery. More importantly, he alludes to a great 1930s debate: Should artillery remain horse-drawn or should motorized artillery take over?

I have had the privilege of working with a still active 50-year government employee who also can attest to this debate. John Cave, currently working at Redstone Arsenal, Alabama, remembers his commander's reaction when he overheard Private Cave say while cleaning the stables that he would be glad when trucks replaced horses. Needless to say, after his commander addressed Private Cave in the third person, the commander said the slow trucks would never replace the horse teams and that Private Cave was assigned stable duties for three weeks for his "insightfulness."

It appears a debate similar to that one is again taking place on the "Top of Signal Mountain." Captain Smith enters this 21st century debate with his experience in the 1990s artillery of multiple-launch rocket systems [MLRS]. In today's uncertain and changing world, we are all looking for well-rounded artillerymen and artillery technology. Well-rounded means both well-planned for proper balance and capable of showing diverse talents. The community must balance tradition with the capability to grasp new battlefield dynamics. As written by Colonel Partridge, Lieutenants Partridge and Westmoreland, as part of the 18th Artillery Regiment (horse-drawn), "...secretly ...knew the horse was on the way out." We need more "old-timers" to take pride in their past successes and either make or allow quantum leaps to the future discussed by lieutenants and captains like Robert Smith. It is no secret— the future is theirs.

Dr. Jeffrey D. Cerny
Advanced Systems Concepts Office
US Army Missile Command
Redstone Arsenal, AL

Why Command?

Captain William M. Rierson commanded Headquarters and Headquarters Battery ("Make It Happen") of the 3d Battalion, 1st Field Artillery, 1st Armored Division Artillery, Germany, for two years. He served 10 years as a 11C (Indirect Fire Infantryman) and 13F (Fire Support Specialist) before going to Officer Candidate School in 1982. In his 20 years of military service, Captain Rierson has held jobs ranging from ammunition bearer to first sergeant (1SG), fire support team (FIST) member, fire support officer (FSO), battalion motor officer (BMO) and battery commander. During his battery command, his unit fought in Southwest Asia during Operation Desert Storm.

The following is an excerpt of his change-of-command speech. It truly explains why officers want to command.

Prelude to the Speech

We're a selfish breed, the officer corps. We enter the Army with high hopes and ambitions, eager to provide the singular contribution that will enable the military establishment to defend our country and our ideals of liberty. Whether it be through technical brilliance or uncommonly resourceful leadership, we hope to make a difference by our mere presence.

Certainly no officers enter the service with the intent of becoming financially independent or improving their social status. So what is it that keeps quality junior grade officers in service when the security and promises of a stable lifestyle seem to be crumbling around our feet as we speak?

I think I inadvertently discovered the reason—one that never occurred to me as

I took command of my battery but did occur as I wrote my change-of-command speech. Because of Desert Storm, my change of command was delayed six months until we returned from Southwest Asia. After 24 months of serving the best battery in the Army, leaving those soldiers turned out to be an emotional and thought-provoking experience. I wrote my change of command speech in the desert at 0300 one morning. Here's part of it.

Farewell to a Battery

...I have a brief message and lesson to share, so bare with me a few minutes. It's a message to Captain Trent Cuthbert [incoming battery commander] and all officers who want to command. It's a lesson about pride, camaraderie and love.

On the morning of 28 February 1991 at 0755 hours came a moment of high emotion, the intensity of which ranks only with a son's graduation or a daughter's marriage. That morning, my right-hand man, 1SG Thomas Foster, and I looked around the combat trains position. We both felt the same emotion, which is difficult to explain. It was a mixture of pride, excitement and relief, overwhelming relief.

The war was over—not as we expected but quick, clean and by-the-book. It had gone as smoothly as a training exercise in Grafenwoehr or Hohenfels. We shook hands, congratulating each other, and I said to the 1SG, "We made it—it's over." Then we went back to work, moving out again that morning.

At the time, that's all I could think of to say. Nothing profound or poetic, just "We made it..."

I personally had done little to get us to that point in the desert. Soldiers won that war, along with airmen, sailors and Marines. Our soldiers and NCOs had performed beyond the Army leadership's expectations, under the harshest conditions, usually in the dark (both literally and figuratively) and under constant threat of attack. I watched them in my battery for 100 hours of miserable conditions and never heard a single word of complaint or gripe. They repeatedly demonstrated a can-do attitude about the mission and courage. I'll give you one example.

About two days into the ground campaign, one of our vehicles and two soldiers became separated from the main body. The vehicle originally had been left with a maintenance unit until it could no longer be towed. Because it was loaded with weapons and ammunition, the soldiers refused to abandon the vehicle. For two more days and nights, they stayed in the desert.

On the third day, the 1SG asked for volunteers to go back into the open desert to find the men and vehicle. Almost the *entire* combat trains volunteered to go find them, even though the volunteers knew the area had remnants of the Republican Guards trying to escape into Iraq, mines, unexploded ordnance and our own units shooting. We had to turn down most of the volunteers because we needed to support the battalion, which those soldiers did superbly. The volunteers found the soldiers marooned in the desert and got them and the vehicle back to safety. The point is, this is the quality of soldiers we have in the Army today.

The soldiers you see here and many others just like them accomplished the mission and took care of each other—have taken care of me for the past 24 months. As their commander, I've often received credit for *their* labors, been congratulated for *their* accomplishments and been overwhelmed with pride for having had the chance to represent them—the finest soldiers ever to wear our uniform.

So why do officers want to command? I speak from experience. It's for those brief moments such as the one in the desert at the end of the war—that eternal moment when we surveyed our position and had won, giving true meaning to command and bringing what we're all about into focus. We seek those moments, though such a moment may only come once in a command, once in a lifetime.

But, ladies and gentlemen, I'm here to tell you that my time with these soldiers has been full of those moments. Grafenwoehr, Hohenfels, Bulldog Week, REFORGER [return of forces to Germany], ARTEPs [Army training and evaluation programs] and, now, the battlefield. I must be the luckiest man alive to have served with the NCOs and soldiers you see here today.

So, young captains about to take command or officers striving to lead our soldiers, the lesson is this. You are inheriting our nation's finest, an Army second to none, who have just proven that on the field of battle. Given the mission, they'll move mountains, one shovelful at a time—if you give them the shovel. They'll sacrifice for each other and for you—if you give them reason. They'll overcome any obstacle in their path—it you show them the way.

As I took command of this battery, I never imagined just how proud I could be of these soldiers, how much I would grow to trust and love each and every one...how much I shall miss them all. There's nothing these soldiers can't do—they truly "Make It Happen."

CPT William M. Rierson, FA
Assistant PMS and Adjutant
First ROTC Region
North Georgia College, Dahlonega, GA

Redlegs Ready for Ranger School

Major Robert Rogers organized the Rangers in 1756, and his first "standing order" to his troops was, "Don't forget nothing." This article suggests ways to help you prepare for the rigors of Ranger School at Fort Benning, Georgia, so you don't forget *nothing*.

Ranger School, spanning two months, provides tough, realistic combat training for small-unit leaders. From the swamps of Florida to the mountains of Georgia, the Ranger student is pushed to his physical and mental limits. A perspective student can never be totally prepared for all the rigors of this course. However, he can build a strong foundation to improve his odds in ultimately wearing the coveted "Black and Gold." Here are some things you can do to prepare for Ranger School.

Read *FM 7-8 Infantry Platoon and Squad.* This field manual gives solid techniques for all patrolling missions encountered during Ranger School. You should emphasize reconnaissance, ambush and raid operations. Keep in mind this field manual shows one of many ways to patrol—not all the ways.

Get in Shape. The Army physical fitness test (APFT) standards for the school are published in SH 21-7, but you should train to exceed these standards. Demanding physical situations will arise throughout the course, and physical prowess is respected by Ranger instructors and students alike. There's no substitute for physical strength and endurance in Ranger School.

Know Your Knots. The mountain phase of Ranger School requires a student pass a knot test. You must tie eight out of 12 knots to standard; all the knots are in the Ranger Handbook. Also, while practicing the knots, ensure you train to the standards outlined in the Ranger Handbook.

Be a Leader. The ultimate goal of Ranger School is to produce effective combat leaders. A leader must set the example and make timely, rational decisions. Demand and enforce high standards of yourself and others.

Ensure Your Records are in Order. Thoroughly reference SH 21-75 before attending the course to be sure you've met all the requirements for Ranger School. In your records, you must have a medical examination dated within 18 months of your reporting date that states you're medically qualified to attend the school and a current HIV test. Your dental records must include a full mouth x-ray. Also, from your chain of command, you must have a written memorandum verifying you have met the Ranger APFT standards (to include chin-ups), completed the combat water survival test, have a valid medical physical and are proficient in the 42 common tasks necessary for attending the course.

Know the Ranger Creed. Be able to recite the creed verbatim. The creed states the essence of being a Ranger—learn it and live it.

Know the OPORD. The operations order (OPORD) is the basis for solid mission execution. Know the OPORD in explicit detail.

Prepare Yourself Mentally to Never Quit. Situations will get desperate at times in Ranger School. Lack of food and sleep eventually drive some students to their lowest levels. To counter that effect, always approach a desperate situation as a leadership challenge.

Read the Ranger Handbook. The Ranger Handbook gives the general knowledge required for success in the course. Become very familiar with it, and know where to reference items in the book quickly.

Ranger Creed

Recognizing that I volunteered as a Ranger, fully knowing the hazards of my chosen profession, I will always endeavor to uphold the prestige, honor and esprit de corps of my Ranger battalion.

Acknowledging the fact that a Ranger is a more elite soldier who arrives at the cutting edge of battle by land, sea or air, I accept the fact that, as a Ranger, my country expects me to move farther, faster and fight harder than any other soldier.

Never shall I fail my comrades. I will always keep myself mentally alert, physically strong and morally straight, and I will shoulder more than my share of the task, whatever it may be. One hundred percent and then some.

Gallantly will I show the world that I am a specially selected and well-trained soldier. My courtesy to superior officers, my neatness of dress and care for equipment shall set the example for others to follow.

Energetically will I meet the enemies of my country. I shall defeat them on the field of battle for I am better trained and will fight with all my might. Surrender is not a Ranger word. I will never leave a fallen comrade to fall into the hands of the enemy, and under no circumstances, will I ever embarrass my country.

Readily will I display the intestinal fortitude required to fight on to the Ranger objective and complete the mission, though I be the lone survivor.

Rangers Lead the Way

Bring Status Cards to the Course. Status cards are a *must* for the Ranger course. They allow the leader to determine his unit's current disposition concerning meals, water, equipment and personnel. You can make your own status cards or buy them at Fort Benning before the course.

Be Prepared to Exploit Your Artillery Skills. Artillery is incorporated into every phase of Ranger School. You can be an asset by offering your artillery skills whenever needed on a patrol. This not only improves your standing, but also helps "sell" artillery to our maneuver counterparts.

Take Care of Your Ranger Buddy. Ranger School is a team effort. *Never* let your Ranger buddy down—take care of each other and graduate.

This is a short list of things you can do to prepare for Ranger School. Leaders attending the school shouldn't forget these basics—shouldn't forget *nothing*. Good luck and give it your best shot!

CPT Ronald D. Francis, FA
S1, 6-8 FA
7th IN Div (Light), Fort Ord, CA

Editor's Note: A new course at Fort Sill, Oklahoma—the Light Fire Support Officer's Course—helps battery-grade officers prepare for both Ranger School and assignment to a light infantry division, a demanding assignment. The two-week course is for Field Artillery Officer Basic Course graduates going to Ranger School or a light unit and for Field Artillery Officer Advanced Course graduates who are to attend Ranger School. See the article "At the Cutting Edge of Battle—The Light Fire Support Officer's Course" by Lieutenant Colonel Thomas G. Waller, Jr. and Captain David W. Riggins on Page 42 of this edition.

Response to "Nuke...End of Mission, Out"

The article "Nuke...End of Mission, Out" [August 1992] was very interesting, especially to those of us whose time in service paralleled the history of nuclear weapons in the Army.

Two minor points. First, one picture was mislabeled—the missile on Page 41 wasn't a Pershing I but the Army Redstone missile. As a young boy growing up in Lawton in the 1950s (my father also was an artilleryman), one of the great shows at the firepower demonstrations on Fort Sill's West Range was the erection of the Redstone and fueling procedures of liquid oxygen. Those demonstrations would indicate the Redstone missile was also an active Army system.

My second point. The job the nuke artillerymen did, either by being a special weapons officer or a member of the various detachments supporting our allies, certainly contributed greatly to winning the Cold War. However, many of them (those of Specialty 52) also became the first casualties when the drawdown began as their skills were no longer needed. It is better to think of them as heroes because many others avoided assignments with the career risks associated with nuclear weapons.

COL Arthur C. Meier II, FA
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Research, Development and
Engineering Center
US Army Missile Command
Redstone Arsenal, AL

Colonel Meier is correct. As several readers have called to our attention, the missile identified as the Pershing I on Page 41 of the article "Nuke...End of Mission, Out" is, indeed, a Redstone missile. We regret the error.

Editor

Major General Waldo D. Freeman, Deputy Commander-in-Chief and Chief of Staff, Central Command (CENTCOM), MacDill Air Force Base, Florida

Operation Restore Hope—
A Logistical Challenge

Interview by Patrecia Slayden Hollis, Managing Editor

At the time Field Artillery interviewed Major General Freeman in April, the US still had approximately 8,000 of its high of 21,500 troops ashore in Somalia in Operation Restore Hope. This included the United Task Force (UNITAF) headquarters plus 4,400 soldiers, 2,500 Marines, 775 sailors and 350 airmen; in addition, we had an amphibious ready group offshore providing support. Our troops had served with some 12,500 soldiers from 22 other countries in the US-led multinational task force, a coalition challenge.

When US forces deployed to Somalia in December of 1992, their mission was first to secure southern Somalia, the area most ravaged by famine, and next to provide security for relief efforts by international nongovernmental agencies. On the map of Somalia in the figure, the broken line approximates the northern limits of UNITAF's area of operations.

With Somalia warlords and gangs marauding against civilians and each other, each with its own agenda and often oblivious to the desperate needs of the Somali population, the US mission has been complicated, demanding joint and coalition peacemaking operations—a form of low-intensity conflict. In addition, the infrastructure in Somalia is very primitive, further complicating operations.

In April, after accomplishing the mission, the US was transferring control of the task force to the UN peacekeeping command. The US was to provide the UN command between 3,000 to 4,000 troops for logistical support plus a quick-reaction force to remain in Somalia. Eventually, the number of US logistical troops in Somalia will decline as private contractors take over most of the support missions. Total UN troops committed for the long term could reach 28,000 with up to 23 nations participating.
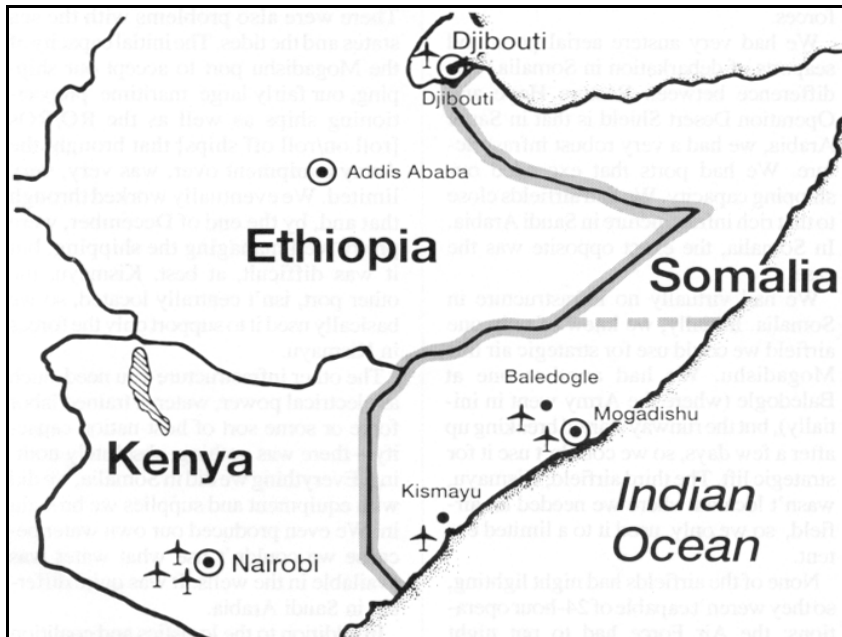
Operation Restore Hope in Southern Somalia. The broken line approximates the northern limits of UNITAF's area of operations.

Q *How do you define the "threat" in Somalia, and how did you "package" the US portion of UNITAF to face that threat?*

A Somalia remains a dangerous and unpredictable environment, despite the security zones UNITAF has established. The specific threat our troops face is inter/intra-group violence and independent criminal activities in Mogadishu and Kismayu—sniping, hand grenades, ambushes, land mines, demonstrations and robberies. The inland areas have been relatively calm. The larger threat would be the renewed disruption of NGO [nongovernmental organization] relief efforts as a consequence of larger scale fractional fighting.

When we went in initially, we weren't sure of the kind of threat we'd face. We knew about the interclan fighting and the types of threats to NGOs, but we weren't sure what the reaction would be to our troops.

The Somali warlords had tanks, artillery and so on. So, we put a decisive conventional force on the ground very quickly, one that could overcome a force with heavy weapons. Fortunately, the actual threat has been more of lawlessness and individual sniping than organized resistance—although there have been a couple of instances of organized resistance that were quickly overcome.

In terms of packaging such a force, you tailor the force for Somalia the way you would a joint task force for any mission, based on METT-T [mission, enemy, terrain, troops and time available]. You package the force to handle the situation with the proper balance of cross-service capabilities, one that's relatively economical. Economy of force is particularly important in a situation like Somalia where the infrastructure is so austere; everything you send in has to be supported.

Q *In general, what are the rules of engagement [ROE] for Somalia?*

A The rules of engagement are always classified, so we can't go into details. The mission in Somalia was peace*making*, not peace*keeping*. In a peacekeeping environment, the troops usually have rules of engagement that authorize self-defense but limit the amount of offensive power they can use.

For Somalia, because it was a peacemaking situation, we crafted ROE that allow our troops more latitude. The UN authorized us to use force as necessary, and our ROE permitted our troops to use enough force to gain control in any situation. That means that, under certain conditions, we could shoot first, and we did.

One of the unheralded reasons for our success in Operation Restore Hope has been the quality of our troops—all troops, not just those in the Army. We have superbly trained NCOs and troops who have high standards and high moral values that enabled them to pull off an operation in a very dicey situation with a lot of class.

The judgement our troops displayed on a day-to-day basis has resulted in their using a minimum amount of force, as

> **❝***The fact that we worked around such an austere infrastructure in Somalia under such conditions and delivered and sustained a US force of more than 20,000 attests to the resilience and flexibility of our people and of our strategic mobility.***❞**

appropriate, and a very low loss of Somali lives. They made good decisions with, in some cases, rocks being thrown at them, sniping and other dangers or irritants. Our troops are smart, well-disciplined, well-trained and highly motivated. You put all these characteristics together and you have troops that can do anything.

In deploying our forces to Somalia, what
Q *were the challenges?*

A The two biggest challenges we faced were logistics operations and putting together and managing a coalition force. By far, the biggest was logistics, but the two are intertwined.

The coalition force presented a political challenge, a military operational challenge of how to build the total force, but also a logistical challenge because, basically, we supported those international forces.

We had very austere aerial ports and seaports of debarkation in Somalia. The difference between Restore Hope and Operation Desert Shield is that in Saudi Arabia, we had a very robust infrastructure. We had ports that exceeded our shipping capacity. We had airfields close to that rich infrastructure in Saudi Arabia. In Somalia, the exact opposite was the case.

We had virtually no infrastructure in Somalia. Initially, we knew of only one airfield we could use for strategic air lift: Mogadishu. We had another one at Baledogle (where the Army went in initially), but the runway started breaking up after a few days, so we couldn't use it for strategic lift. The third airfield, Kismayu, wasn't located where we needed an airfield, so we only used it to a limited extent.

None of the airfields had night lighting, so they weren't capable of 24-hour operations; the Air Force had to put night lighting into Mogadishu airfield as a first priority. Moreover, none of the airfields had much ramp space or parking space, limiting the number of airplanes you could

have on the ground at any one time. We could only bring in about one airplane an hour as compared to at least 10 times that capacity in Saudi Arabia. It was like sucking through a straw.

If anything, the ports were an even bigger problem. The Mogadishu port hadn't been used in about three months and before that, only on a sporadic basis for almost two years because of the clan fighting. The clans would actually shoot at relief ships and dock personnel as they tried to off-load; the same was true at the airports before we went in.

We didn't know enough about Mogadishu port before—it wasn't much of a port to begin with. We had some aerial photos that indicated sunken ships were at the piers and in our shipping routes. There were also problems with the sea states and the tides. The initial capacity of the Mogadishu port to accept our shipping, our fairly large maritime prepositioning ships as well as the RO/ROs [roll on/roll off ships] that brought the Army equipment over, was very, very limited. We eventually worked through that and, by the end of December, were pretty well managing the shipping, but it was difficult, at best. Kismayu, the other port, isn't centrally located, so we basically used it to support only the forces in Kismayu.

The other infrastructure you need, such as electrical power, water, a trained labor force or some sort of host-nation capacity—there was nothing, absolutely nothing. Everything we did in Somalia, we did with equipment and supplies we brought in. We even produced our own water because we couldn't use what water was available in the wells. It was quite different in Saudi Arabia.

In addition to the logistics and coalition challenges, Somalia had no government. Restore Hope was necessary because of anarchy: widespread looting, robbery and

66 *Having 23 countries involved in Restore Hope created a management problem in sequencing units and finding the proper place to employ them, given their capabilities and limitations.* **99**
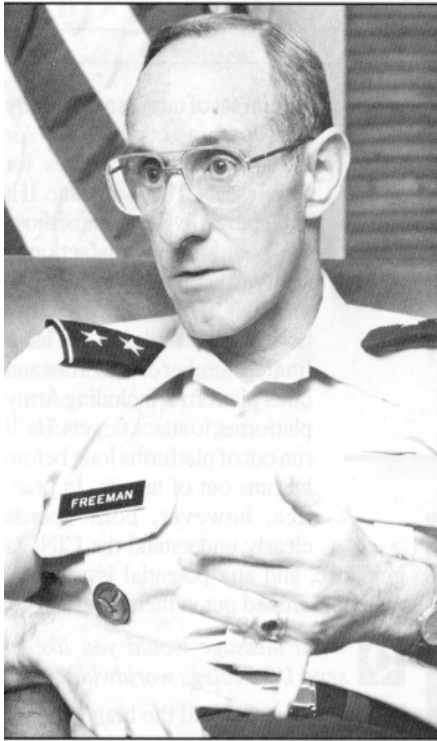
murder. Lack of a legitimate government, a central authority, made our task more difficult because we operated in a vacuum.

The fact that we worked around such an austere infrastructure in Somalia under such conditions and delivered and sustained a US force of more than 20,000 attests to the resilience and flexibility of our people and of our strategic mobility.

Q *What were the challenges we faced as part of a multinational task force?*

A We welcomed allied support—the broader the better. But having 22 countries, in addition to the US, involved in Restore Hope did present some challenges. Integrating the countries' troops into the task force, establishing command and control and coordinating security operations were all challenges. But as I mentioned earlier, logistics remained our biggest challenge.

Initially when the US demonstrated commitment to solving the problem in Somalia, a number of allies immediately came forward and indicated their willingness to work with us. The French, for example, flew troops from Djibouti to Mogadishu on the first day. Others came forward fairly quickly and wanted to support and be integrated. As long as the number of countries was relatively small and those countries were capable of sustaining themselves, it was easily manageable. It became more difficult when a large number of countries all wanted to come to Somalia fairly quickly,

many of which couldn't sustain themselves.

Unlike, for example, the French, Italians and the Canadians, many of the smaller countries were willing to participate but needed a lot of support. We had countries that asked us to provide *everything*, down to and including uniforms and boots for their troops—which, logistically, we weren't prepared to do.

Having 23 countries involved in Restore Hope created a management problem in sequencing units and finding the proper place to employ them, given their capabilities and limitations. We worked most of this through the UN.

One way we helped solve the problem was to ask countries willing to participate to send a liaison officer to CENTCOM headquarters here at MacDill Air Force Base for initial planning. In addition, we asked them to send a small liaison team to Mogadishu a week or more before their troops arrived to coordinate their arrival and placement.

At CENTCOM, we discussed with the countries what was doable and what they were willing to do because, in some cases, countries placed limitations on employing their forces. For example, some said they'd go to Mogadishu but no place else. We began to have near grid lock of forces in Mogadishu that didn't want to go any place else.

The number of troops the countries contributed ranged from a couple of thousand, for example France and Italy, down to less than a hundred—smaller detachments of 50 or 60 people. In some cases, the smaller contributions were very useful, though, with unique skills or capabilities. The New Zealanders, for example, sent three Andover transport airplanes with crews, only about 87 people, to Mogadishu. They were very useful for airlift for the joint task force. Many of the contributions were company-sized units.

Because each country had unique requirements, our support for each was slightly different. Our logistical support for other nations ranged from providing almost nothing, as in the case of the Canadians, to almost everything, just short

of boots and uniforms, to others. The Canadians flew C-130s from Canada to their support base in Kenya and then also had a logistics ship to support their own troops. They required very little support, only petroleum and water.

Q *How should the Army increase the lethality and, thereby, the survivability of early deploying forces in any contingency operation?*

A My answer doesn't call for a technical solution; rather, it is to preposition heavy equipment and supplies ashore and on ships in the AOR [area of responsibility]. Such prepositioning permits a rapid build-up of combat power.

In our theater, it's virtually impossible to improve the early survivability and lethality of deploying units if they have to bring everything from the States. If we preposition most of a heavy force's major items of equipment in theater, much as we did in Europe for so long, we can bring troops over and marry them with the equipment, quickly achieving a large enough force for the imposing size alone to improve survivability. This is the classic power projection dilemma.

With prepositioning, we wouldn't find ourselves in the same situation as in the early days of Desert Shield. We rapidly deployed light forces, but once there, the soldiers felt like speed bumps for a while. They had the strategic mobility but not the heavy systems needed for lethality and survivability.

So CENTCOM is pushing for prepositioning of heavy forces with some success now.

Q *In combined combat operations, at what levels (battalion, brigade or higher) do you see the cross-attachment of US and foreign forces? What are the support and sustainment implications of such cross-attachments?*

A In my previous assignment at SHAPE [Supreme Headquarters Allied Powers Europe] in Belgium, we looked very closely at the levels at which

cross-attachments were feasible. We concluded that the lower the unit level cross-attached internationally, the more difficult it becomes, and it's best not to cross-attach below the division level. In other words, a multinational corps was possible if you had, say, a division from another nation attached to that corps.

Obviously, you can cross-attach below the division level. You can attach brigades to a US division in mid-intensity operations, but it's difficult. And in NATO, for years we've run exercises with brigades, even battalions, cross-attached and we've worked our way through it. But the number of problems you encounter increases dramatically as you lower the level of cross-attachments.

Example—language. Normally, if you're working, say, at the corps level and you've got a division attached from another nation, enough people speak each others language to handle all the liaison jobs and so on. But if you cross-attach at lower and lower levels, you're less and less likely to find people who have the language skills to provide all the interfaces necessary. Likewise, as you get down to lower levels, you get closer and closer to the front lines, in essence, where very tight coordination is absolutely critical to prevent fratricide or gaps.

Interoperability of equipment, standardized procedures, unique logistical support and maintenance requirements, doctrine—all these differences complicate cross-attachments with allies, and these intensify at the lower levels. So, the short answer is, the lower you go, the harder it gets.

But you can make it work at almost any level. And, by the way, we made it work in Restore Hope. We cross-attached units down to the company level, and it worked quite well. We had a US Marine company, for example, subordinate to the Belgians in the landing at Kismayu. All the forces over there under UNITAF were, in essence, OPCON to [under the operational control of] the US. But fortunately in Restore Hope, we did *not* face mid-intensity combat where the difficulties of integration, of communications and coordination, could have ended up costing lives.

Q CENTCOM has a joint targeting board [JTB] controlled by the

> **"Our logistical support for other nations ranged from providing almost nothing, as in the case of the Canadians, to almost everything, just short of boots and uniforms, to others."**
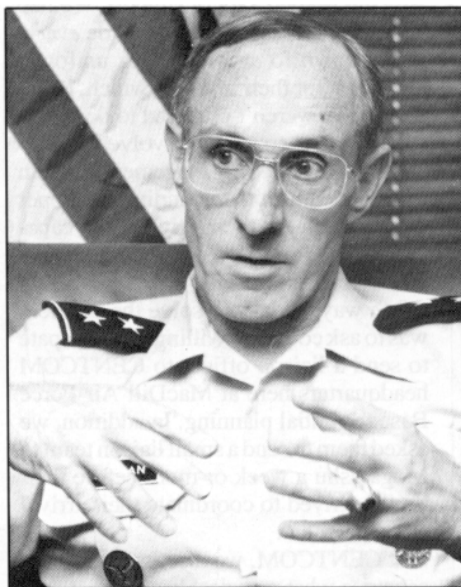
deputy commander-in-chief [DCINC] and a joint targeting coordination board [JTCB] controlled by the joint force air component commander [JFACC]. What's the relationship between the two?

A The JTB, run by the DCINC, is the CINC's targeting board that provides operational and strategic targeting and apportionment guidance. The JTCB, run by the JFACC, ensures the JTB guidance is translated into a coordinated and integrated daily master plan, which ultimately results in an executable air tasking order [ATO]. It works the detailed breakout of resources to attack the targets and synchronizes all service systems into the overall fire support plan on a daily basis.

Both boards, of course, work for the CINC. The components are represented on both the JTB and JTCB. If a component is unhappy with a particular resource allocation, then the issue is raised to the CINC for resolution. Let me give you an example. Let's say the Army wants a certain set of targets attacked by Air Force assets and the Air Force has other priorities for those assets. That's an issue.

If it can't be resolved by one of those two boards to the satisfaction of both parties, then it's elevated to the CINC. He decides, based on his resources and plan. He has a limited number of air sorties and other platforms, including Army platforms, to attack targets. He'll run out of platforms long before he runs out of targets. In practice, however, both boards clearly understand the CINC's guidance, and any potential issues normally are ironed out at their levels.

Q What message would you like to send US Redlegs worldwide?

A Artillery, like all the branches and services, must remain focused on our core mission: warfighting. That focus plus quality troops and leaders and tough training won the Cold War and made us successful in Operation Desert Storm.

You're part of the best Army in the best armed forces in the world because of the high standards we set. We must not compromise those standards or change our focus as we chart a course through this turbulent decade.

★★

Major General Waldo D. Freeman is the Deputy Commander-in-Chief and Chief of Staff of the United States Central Command, MacDill Air Force Base, Florida. His previous assignment was as Chief of the Policy and Programs Branch of Supreme Headquarters Allied Command Europe in Belgium. Other key assignments include Program Manager for the modernization of the Saudi Arabian National Guard in Riyadh and Assistant Division Commander of the 3d Infantry Division (Mechanized) in Germany. Major General Freeman commanded the 2d Brigade, 3d Armored Division in Germany; the 2d Battalion, 3d Training Brigade at Fort Dix, New Jersey; the 1st Battalion, 17th Infantry, 2d Infantry Division in Korea; and two rifle companies, one in Germany and the other during one of his two tours in Vietnam. He holds a master's degree in International Relations from the Johns Hopkins University School of Advanced International Studies.

Major General Graham S. Hollands, Royal Artillery, Chief of Combat Support, Allied Command Europe (ACE) Rapid Reaction Corps

"Fortune Favors the Brave"—
NATO's New Rapid Reaction Corps

Interview by Lieutenant Colonel Jerry C. Hill, Editor

Major General Hollands is the Chief of Combat Support for the ACE Rapid Reaction Corps (ARRC) established in October 1992. This position reflects his peacetime duties; in conflict, General Hollands would perform the duties of Commander of Offensive Support. As such, he would command those assets required to fight the corps deep battle.
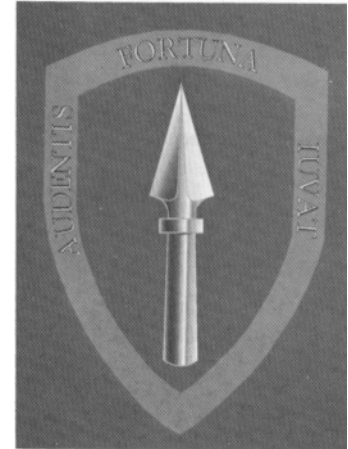
Q *What is the mission of the new ARRC, and how is it organized?*

A The mission is to be prepared to deploy ARRC corps troops and up to four divisions on military operations in support of the SACEUR's [Supreme Allied Commander Europe's] crisis management options. That mission developed from the original mission that specified the ARRC be limited to reacting to crises within ACE. Recently, this geographical limitation has been deleted because of influences that could come from outside ACE. Interestingly, this change came *before* the crisis in the former Yugoslavia reached its current level.

To amplify the mission, I think it's quite important to record the words of the Secretary General of NATO, Dr. Manfred Worner, at the inauguration ceremony for the ARRC, in Bielefeld, Germany, on 2 October 1992. He said—

This ceremony marks the beginning of an important common enterprise at a time when siren voices are arguing that the Alliance is in decline. They could not be further from the truth. NATO will take over the additional role of crisis management and will become an important instrument for the support of peace missions by the UN or the CSCE [Conference for Security and Cooperation in Europe].

At the same ceremony, the SACEUR, General John M. Shalikashvili, further amplified the mission of the corps and said—

This corps represents the Alliance of tomorrow....[It] will be able to draw from 13 NATO nations' forces, which are capable, competent and comprised of a full range of capabilities, the very best our nations have to offer. But this force is not a warfighting force in the Cold War sense; it will stand ready to tackle a whole mix of missions, ranging from humanitarian aid through peacekeeping and peacemaking to, if all else fails, high-intensity conflict.

Now, in describing the organization of the corps [see Figure 1, Page 10], there are several important points. First, the corps headquarters and two multinational divisional headquarters—Multinational Division-Central and Multinational Division-South—are the only components directly under the SACEUR's command. The remainder of the forces, those nine divisions and the Spanish FAR, are assigned by the nations. Some of the divisions don't yet exist. But by 1995, the nations have agreed they'll be formed and capable of joining the corps' order of battle.

Within the organization, there also are national divisions, such as the United Kingdom's [UK's] 1st Armored Division. There are framework divisions, such as the Italian Division, and the multinational divisions I have already mentioned.

We expect the US contribution to this organization to be one of the divisions based in Germany.

Q *What type of contingency missions are you planning for?*

A The corps is planning for the whole spectrum of conflict: from major regional conflict, as we now define it, to peace support operations. For organizational purposes and to give us a focus early on, our preoccupation has been with major regional conflict, mostly connected with the Southern Region.

Our provisional planning has been organized by region. For the Allied Forces North (West), or AFNORTH (W), which includes Norway and Britain, we're concerned with regional conflict. In the Central Region, we focus on major conflict. In the Southern Region, including Italy, Greece, the Balkans and Turkey, we're planning for the complete spectrum of operations. We had defined our planning priorities before the situation in the Balkans reached its current level of intensity.

Q *The ARRC has been designed around a framework of assigned divisions as opposed to using a task force approach. How will this contribute to the effectiveness of the corps?*

A As we move away from the bipolar world order, we're going to have to measure effectiveness in different ways than we have historically. Military effectiveness in a multinational force—with all the constraints and realities of budgets, development of common doctrine and so on—is going to be more difficult to achieve, a considerable challenge.

However, the total effectiveness of any force deployed under the ARRC banner will have the added power of its political nature; it will be multinational and will be

employed with the consensus of the international community. As such, it will send a very powerful signal to those against whom it is deployed. This represents a new reality.

It will be much more difficult for the ARRC to achieve the levels of military effectiveness historically achieved at the corps level. But, I think, as a politico-military force, it will be much more effective. With most of the assigned forces organized at the divisional level, there's already coherence that should allow us to achieve significant military effectiveness that will be enhanced over time through training together.

Q *How does the ARRC fit into the NATO command structure?*

A The ARRC is under the command of the SACEUR. Within the Supreme Headquarters Allied Powers Europe [SHAPE], a new organization has been established called the Reaction Forces Planning Staff. It plans operations for air, land and sea reaction forces. And it's from this staff that we get our broad direction on planning, and through it, we routinely deal with SHAPE. The commander of the ARRC has direct access to SACEUR. Very much, therefore, we are the SACEUR's asset.

As I described, the permanent structure includes only two multinational divisional headquarters. The remainder of the forces are assigned to us. The relationship we have with those assigned forces will depend on the nation's wishes when they assign them. The nations may assign them under operational command, operational control or some other relationship. These are modalities we have to sort out as we develop this structure and as forces are assigned for specific military operations.

The ARRC is part of a three-tiered force structure in NATO that consists of main defensive forces, augmentation forces and reaction forces. Each tier has a land, sea and air component. Reaction forces are further divided into immediate reaction forces and reaction forces. The ARRC is part of reaction forces, and once deployed in support of one of the SACEUR's crisis management options, its mission may or may not involve major regional, regional or peace support operations.

The ARRC would operate under the operational command and control of one of the ACE major subordinate commands [MSCs]. For example, if we deployed to Bosnia-Herzegovina on peace support operations, we'd probably report to SACEUR through Allied Forces Southern Europe (AFSOUTH).

Q *What challenges do you foresee in establishing and maintaining the operational and training standards required to be ready to deploy and fight the ARRC on short notice?*

A Training is a considerable challenge for us. It's not only the business of training, it's more fundamental than that. Who pays for training? What doctrine or concepts do we use as a basis for that training? It's very much a part of my task to develop those concepts and the training to support the implementation of those concepts. Then, we must send our proposals through the corps staff up through SHAPE and out to the divisions to secure funding for the activities required.

Bear in mind that the ARRC headquarters only was established in October of last year, so we've yet to work through these problems fully. What is encouraging is the degree of consensus among the nations as to what the requirements are. Now we must get the budgetary commitments from nations to fund the activities necessary to reach the required levels of training.

Also key will be establishing appropriate training standards. Because nations each have a different approach to training, they will have to agree and perfect techniques to establish a common baseline.
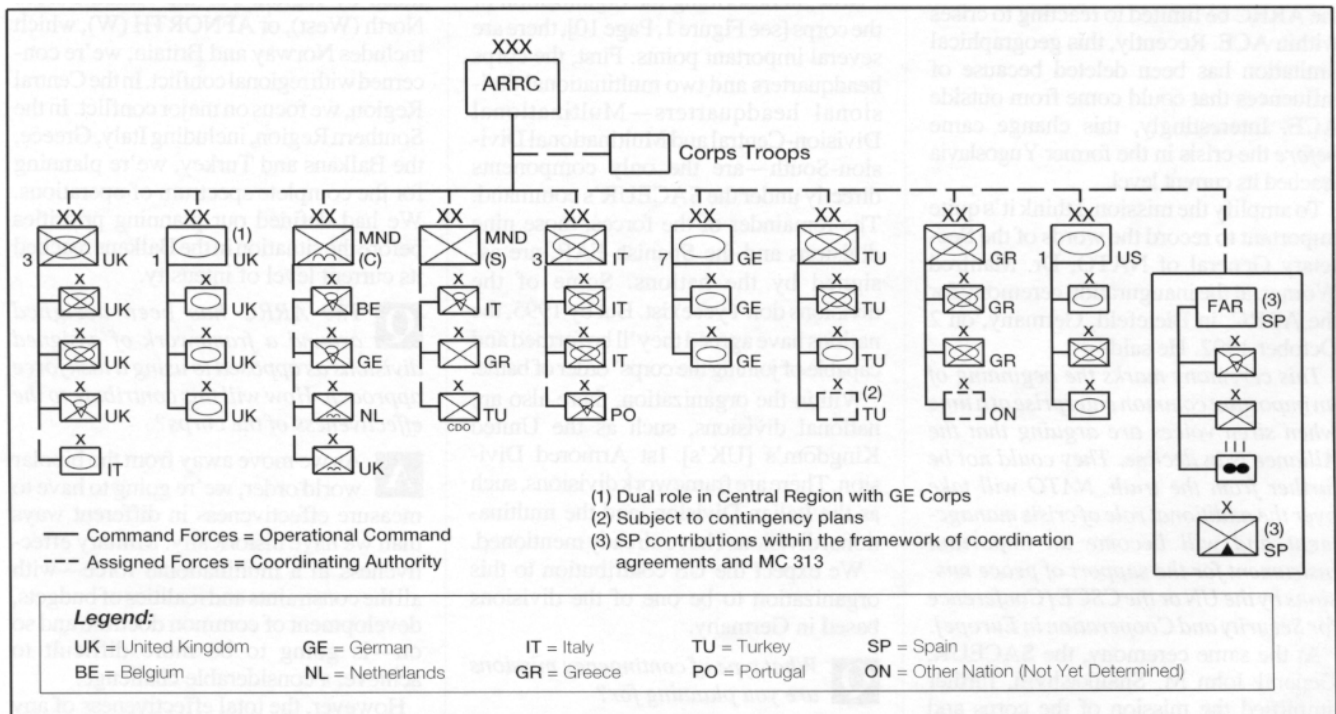
Figure 1: ARRC Organization. All forces are assigned except the two multinational division (MND) headquarters that are under operational command of the ARRC.

Command Forces = Operational Command
Assigned Forces = Coordinating Authority

(1) Dual role in Central Region with GE Corps
(2) Subject to contingency plans
(3) SP contributions within the framework of coordination agreements and MC 313

Legend:

UK = United Kingdom	GE = German	IT = Italy	TU = Turkey	SP = Spain
BE = Belgium	NL = Netherlands	GR = Greece	PO = Portugal	ON = Other Nation (Not Yet Determined)

Q *What type of training exercises do you see the corps conducting to establish and maintain that proficiency? Do you anticipate the corps will participate in the US Army's Battle Command Training Program or similar corps-level exercises?*

A Our training is essentially a bottom-up process, and already we've started a program of study periods, map exercises and tactical exercises without troops [TEWTs] internally in the headquarters and involving staff officers from other assigned divisions. Of course, we first have to educate our own staffs as to what we're seeking to achieve and develop our concepts. We then have to publish these to the assigned divisions and corps troops as a basis for ongoing training. We're conducting internal exercises and providing controllers to national exercises. So there will be a lot of the personalities from the ARRC traveling widely to spread the message and take part in the exercises of assigned troops.

Post-1994, we'll be written into the Right Mix Exercise Program and play a full part in the regional CPX [command post exercise] and CFX [command field exercise] planning. Right Mix is SACEUR's ongoing study into the right blend of training within NATO, in terms of type and frequency, to ensure the operational effectiveness of assigned forces. The process of defining the number and levels of exercises is under way.

We are not currently planning to take part in your Battle Command Training Program (BCTP) until we have trained for our primary role within ACE. Once we are mission-capable in that role, we could take on a commitment to your BCTP, which, in the context of training for peace support operations, could be sooner not later.

Q *As the Commander of Offensive Support for the corps, how would you integrate and synchronize the corps fires, given the potential of fire support coming from different nations and weapons systems and based on differing doctrines?*

A A common understanding is the basis upon which we must develop our procedures. That's what we're developing now—evolving what we call offensive support. When we establish that and have spread the message throughout the assigned troops, we can train both internally and nationally. At that point, we can monitor
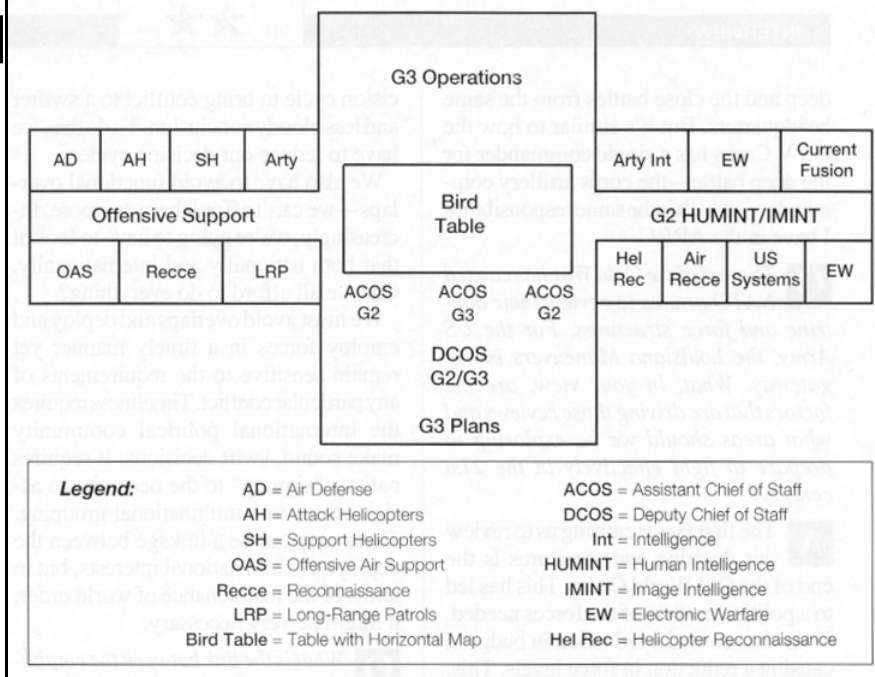
Figure 2: Command and Control Elements of the ARRC Headquarters

how each nation is progressing against established training criteria. Then in post-1994, as we go through our exercise program, we can bring it all together. It all starts from establishing the concepts and doctrine, essentially, based on practices familiar to NATO. We're drawing very heavily on the US AirLand Battle doctrine as currently published and on our practices that have developed alongside yours.

Q *How do you envision deep operations being managed in the ARRC?*

A The corps battle has two key parts—close and deep. The G3 Operations is responsible for the close battle, and I, as Commander of Offensive Support, am responsible for the deep battle. The split of resources between the two and the allocation of priorities to the G2, which impacts on RISTA [reconnaissance, intelligence, surveillance and target acquisition] taskings, is decided by the corps commander and his command group.

The command group consists of myself, the deputy chief of staff G2/G3 [DCOS G2/G3] and the corps chief of staff. The chief of staff implements and coordinates the commander's direction through both myself and the DCOS G2/G3 to the corps staff. Once the resources and the priorities have been allocated, the offensive support staff gets on with implementing the direction I give them for the deep battle.

The next step in the process is to get the latest information from the G2 on the location of the enemy in the deep battle

area. Then the offensive support operations and plans staff tasks the allocated RISTA resources against them. The information gathered by this process is reported back to the G2 for the command group to analyze and assess.

This process allows us to balance resources between the close and the deep battles and tune our plan before the deep battle is set. Orders can then be issued to both strike and RISTA assets for execution against the enemy.

This is a dynamic process, one that requires constant exchange of information, adjustment of priorities and reallocation of resources to match the unexpected in the ebb and flow of battle between the close and deep battle areas. Resources can be reallocated at any point.

To facilitate the dynamics, the ergonomics of the headquarters design needs to be carefully thought-out. The current design of the main headquarters for the ARRC reflects this philosophy [see Figure 2]. The design provides total transparency between the main staff cells, thus allowing rapid exchange of information and achieving a single focus for the conduct of operations. So, I'm not fighting a separate battle. I might be fighting the deep battle which, in time, is before the close battle, but they're inextricably interlinked.

The process might be slightly different from US doctrine in that we'll fight the

deep and the close battles from the same headquarters. But it's similar to how the US V Corps has a single commander for the deep battle—the corps artillery commander—which is the same responsibility I have in the ARRC.

Q *The end of the Cold War has caused NATO armies to review their doctrine and force structures. For the US Army, the Louisiana Maneuvers is our gateway. What, in your view, are the factors that are driving those reviews and what areas should we be exploring to prepare to fight effectively in the 21st century?*

A The first factor causing us to review our doctrine and structures is the end of the Old World Order. This has led to a political review of the forces needed. It also has caused a reduction in budgets, causing a reduction in force levels. This, in turn, brings a demand for increased lethality for those forces that remain. And as we reduce our force levels, we must reduce the overlaps between capabilities that currently exist.

We now must look at new political and social imperatives of warfighting that demand fewer casualties. The media's attention to war requires we reduce the possibility of reaching the close battle stage. This is leading us to look carefully at prosecuting war through the deep battle and to high-precision weapons and greater sensor capabilities to prosecute that battle.

These factors are leading us to look at an entirely new type of conflict. We've already talked about the SACEUR's crisis management options. What does that mean? We're looking at conflict in terms of being preemptive—of having the forces available to prevent conflict. But to prevent conflict properly, we have to have effective and capable forces.

We must have a multinational consensus for employing these forces, and they must be capable of operations throughout the spectrum of conflict—from peace support operations of the sort the American forces and others are doing in Somalia through to a major regional conflict.

Q *With the increasing emphasis on deep operations and their implications for how command and control is exercised, what key principles should we be applying?*

A We've got to be much more capable of getting inside an opponent's decision cycle to bring conflict to a swifter and less bloody conclusion. To do this, we

have to reduce our decision cycles.

We also have to avoid functional overlaps—we can't afford them anymore. Increasingly, we're going to have to look at that both nationally and internationally. Can we all afford to do everything?

We must avoid overlaps and deploy and employ forces in a timely manner yet remain sensitive to the requirements of any particular conflict. Timeliness requires the international political community make sound, swift decisions. It requires nations "sign up" to the necessity to assign forces to a multinational grouping. There may not be a linkage between the deployment and national interests, but in terms of the maintenance of world order, it might be very necessary.

Q *What is the link between the emphasis on interdiction warfare and peace support operations the ARRC could be assigned?*

A The link is less clear cut in peace support operations, as we understand them. But we have to be prepared at any stage for the level of conflict to escalate, if only for a short time, from low-intensity to a much higher level of intensity. This might involve a deeper capability.

Even in peace support operations, we must have an appreciation of the terrain, of the environment in which we operate that may dictate some of the capabilities we employ. We'll need reconnaissance and intelligence capabilities to conduct peace support operations effectively. Using those capabilities as a starting point, you tailor the force to operate in the various stages of conflict to the higher levels of intensity.

If we're dealing with a terrorist situation, then we need information about the terrorist's lines of supply, bases and where they're being supplied from and are gathering their intelligence from. So, in that context, there's a linkage between deep operations and every level of conflict.

Q *Where should the Field Artillery be targeting our investments in technology, equipment and doctrine to meet the challenging and diverse missions of the future?*

The link between sensors and strike assets **A** is important. If we're going to succeed, it's imperative we reduce the nature of the close battle so it's less dramatic and intense. To do this, we must increase range and target effects.

We also must match that development with sensor technology. The British Army,

historically, has not done very well in that regard. Roughly 85 percent of our investment has been in strike systems, and these have not been matched by the targeting systems that enable them to be employed properly. We need to dovetail our doctrines to employ strike and sensor assets much more closely than we have in the past.

We also need to further develop the role of artillery commanders as joint commanders of the deep battle. Whatever systems they employ, they'll need the means to do that, which requires an investment in command and control systems. Although we've identified that required linkage, we've not been "electric" in implementation.

Q *What message would you like to send to US Redlegs worldwide?*

A You couched the question to include "worldwide," I could say *ubique,* which is latin for "everywhere" and the motto of the British Royal Artillery.

As artillerymen, you must recognize the preeminent part you'll play on any battlefield, at any level of conflict—undertaking any role as we embark into the future.

★★

Major General Graham S. Hollands, Royal Artillery, is Chief of Combat Support for the Allied Command Europe Rapid Reaction Corps with its headquarters in Bielefeld, Germany. He assumed the appointment of Commander Artillery of the 1st British Corps in February 1992, which reverted to his current appointment in October. Prior to that appointment, he was Deputy Chief of Staff at Headquarters, British Army of the Rhine. Major General Hollands' commands include Royal Artillery, 2d Infantry Division and the York Garrison; British Advisory Training Teams, Nigeria; 25th Field Regiment Royal Artillery and, later, the 3d Regiment Royal Horse Artillery, which took the place of the 25th Regiment in England; and C Anti-Tank Battery, Royal Horse Artillery in Germany, as part of the 2d Division.

Operation Desert Storm—

Mobilization and Deployment of the 142d Field Artillery Brigade

by Colonel Charles J. Linch, ARNG

Many people have asked what it was like—what were the problems and what effect did being "called up" for Operation Desert Storm have on the 142d Field Artillery Brigade, Arkansas Army National Guard. The easy answer could be in the old saying, "He who rides the tiger cannot dismount."

Once the activation order came, our only option was to adjust mentally and then rapidly transition from citizen soldier to full-time soldier. The physical and mental change to active duty was relatively easy. The emotional transition of leaving family, homes and jobs, then entering the stress of a different life style, facing the high probability of combat and other unknowns was not easy. However, since World War I, the brigade's motto has been **"Answers the Call,"** *and that is what we did.*

Our mobilization, deployment and combat assignment uncovered only a few more problems than active duty units encountered. Equipment shortages were our major "warstopper." All other problems required an adjustment in the methods and procedures we used in training. The lack of major problems can be explained by describing how the 142d trained prior to Desert Storm, how the Arkansas' Adjutant General and his staff supported our training program and how Fort Sill, III Corps Artillery and VII Corps assisted and accepted us on active duty.

Training Strategy

The 142d had just completed a five-year training strategy adjustment. In 1984 we studied the Army training and evaluation program (ARTEP) and training guidance for combined arms operations. We concluded that only howitzer batteries of armored cavalry units fought as batteries. As general support (GS) artillery units, we would be expected to mass fires as battalions or brigades. It was apparent that we needed to increase our training level, develop strong battle staffs and fully functional tactical operations centers (TOCs).

It took three hard training years to take control from the batteries and develop competent battle staffs. TOC operations did not jell into real teamwork until the third year.

The 1st Battalion, 142d Field Artillery (FA) conducted a mobilization and deployment exercise to Camp Grayling, Michigan, for Annual Training (AT) 87. All equipment was shipped by barge or flown by C-5A. The troops were transported by National Guard C-130 aircraft on a training mission. The mobilization exercise, barge tie-down and loading, along with manifest preparation for the aircraft, was an experience that carried over to follow-on deployments. In Training Year 88, we increased our training level to brigade operations and conducted all field training as a two-battalion brigade.

AT 89 was conducted at Fort Carson, Colorado, as an FA brigade. This time all equipment was rail-loaded and troops were transported by bus. All mobilization and deployment requirements were again practiced. Our transition to brigade-level operations actually took two years to get a real feel for execution time and space management. Command and control of two FA battalions and a target acquisition battery (TAB)(-) proved to be more difficult than during a command post exercise (CPX).

In addition to scheduled training, we managed to send more than 200 soldiers on key personnel update program (KPUP) tours to the National Training Center (NTC), Fort Irwin, California. We deployed a 55-man cell to the NTC in February
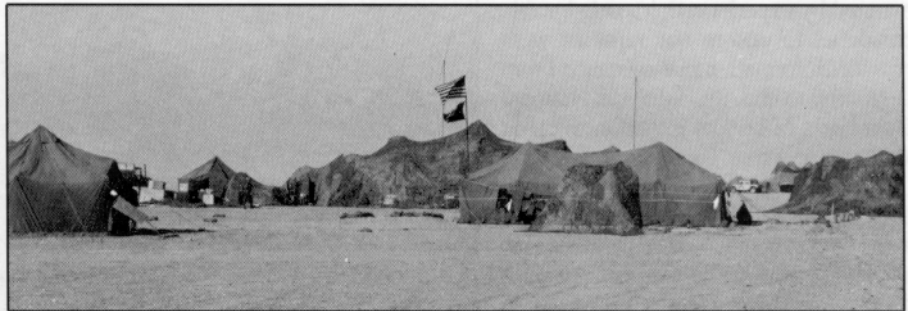
The 142d Field Artillery Brigade's TOC in tactical assembly area (TAA) Hog.

1989 to form a reinforcing battalion TOC for the 1st Infantry Division (Mechanized) rotation and had another 55-man cell in a train-up with the 3d Armored Cavalry Regiment when Desert Shield started.

The lessons learned from deploying the brigade to distant training sites and to the NTC were applied to training at all levels in the 142d. We trained with units from III Corps Artillery, the 5th Infantry Division (Mechanized), 1st Infantry Division (Mechanized) and 3d Armored Cavalry Regiment. We studied how these units operated, what their terms and graphics meant to them and, most of all, how we fit into the combined arms team. When the 142d was activated, our soldiers were confident in their training and at least some active units knew who we were and had accepted us as a combat multiplier.

Arkansas Support

None of our deployments or training events would have been possible without the total support of the Arkansas Adjutant General and his staff. Training funds were always in short supply, and many times it took a mad scramble for the state to secure adequate funding. State logistics personnel came up with innovative methods to transport troops and equipment. Arkansas provided departure airfield control group (DACG) and arrival airfield control group (AACG) teams on both ends of our deployment exercises. The state mobilization officer concentrated on mobilization plans that required all deployable units to mobilize with very little external assistance.

When the orders came for the 142d to activate, several key officer positions were filled from state assets. The state immediately assisted in issuing the contingency stock of mission-oriented protective posture (MOPP) suits, clothing and TA-50 equipment. When we departed from home station, each of our 11 armories were manned by experienced, knowledgeable personnel to ensure our families were provided information and assistance. From beginning to end, the Arkansas National Guard was of critical importance in our ability to be a true Total Force entity.

So we had trained to standard, conducted realistic mobilization and deployment exercises, received tremendous support and were as ready as any under-equipped National Guard unit could be. When the orders came, we had three days at home station to complete our mobilization packets, cross-level within the brigade, pick up our contingency stocks, pack and load equipment, send out our advance party and prepare 500 vehicles and 1,200 solders for the 400-mile convoy to Fort Sill.

Our pre-planning proved to be adequate and flexible enough to handle surprises. We were told not to bring any vehicles to the mobilization station that required mogas. This caused some adjustment to load plans and transportation of personnel. The change over to Army supply requisitions was not as painless as we had been led to believe. Our first problems occurred in the changeover to the Army's logistics and personnel procedures. The tactical Army combat service support computer system (TACCS) was new to us; however, once we learned to use it and got the right data entered, most of the problems were solved.

Active Army Support

The convoy to the mobilization station was uneventful and verified our maintenance program. Fort Sill was completely ready for our arrival and had a clear program for us to follow. Fort Sill military and civilian personnel, along with III Corps Artillery, welcomed us as a new unit on post. They immediately went to work to ensure we received any additional personnel, equipment and training needed to deploy. Brigadier General Frank L. Miller, Jr., then-Commander of III Corps Artillery, and his staff led, directed and kept us on a "zero mils" course through preparation for overseas movement (POM).

Although we were a C-3 (unit status level) unit by Department of the Army and National Guard Bureau standards, a quick look at our equipment shortages disclosed that only a fool or a desperate person would commit us to combat. We had about 50 percent of the required communications equipment, 20 percent of required communications secure devices, an antique meteorological station, 50 percent of our fuel tankers, 18 of 24 howitzers, 20 percent of our night-vision devices and were short 30 high-mobility multipurpose wheeled vehicles (HMMWVs). We did not have any digital artillery automation capability at the battalion or brigade headquarters. In addition to modification table of organization and equipment (MTOE) shortages, we had been instructed by the National Guard Bureau to leave our computers, copy machines and secure-voice capable (STU III) telephones at home station.

Brigadier General Miller and the Field Artillery School department directors at Fort Sill, along with our logistics personnel and commanders, worked 24 hours a day from 23 November to 15 December to fill equipment shortages. Fort Sill's goal was to equip the 142d as well as they had the 75th and 212th Field Artillery Brigades, which were already in Saudi Arabia. This was the most hectic 23 days of my life. In addition to equipment procurement, we completed POM, picked up the 1st Battalion, 158th Field Artillery as our third battalion, had 850 vehicles painted desert sand, conducted individual training, rail-loaded all vehicles, packed 38 military-owned demountable containers (MIL VANs) and started classes on the lightweight tactical fire direction system (LTACFIRE) and meteorological data system (MDS).

On 15 December our equipment left for the port. The next 30 days were filled with individual training, becoming proficient with LTACFIRE and continually receiving and packing supplies for shipment.

I briefed Brigadier General Creighton W. Abrams, Jr., Commander, VII Corps Artillery, in December of 1990 and was impressed by his attitude toward a National Guard artillery brigade. He indicated that he didn't see a National Guard unit,

Brigade members unload tracked vehicles in the TAA.

The Brigade's howitzers and launchers arrived on host-nation vehicles five days before the war started.
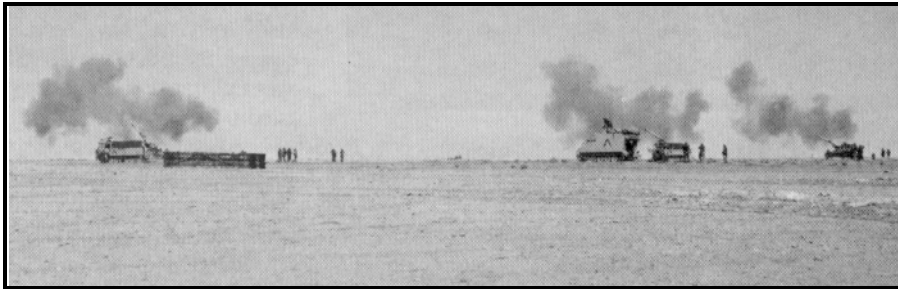
142d FA Brigade howitzers firing a combat mission.

just an FA Brigade he needed to accomplish his mission. Our goal had always been to look like, act like and fight as well as any active brigade. Our job was to get there and fit into our small slot in VII Corps. In return, VII Corps gave us the same attention and assistance everyone else received.

Our first units arrived in Saudi Arabia on 14 January 1991. All of our personnel were in country by 28 January. The majority of our wheeled vehicles and supplies arrived during our first week in Daharan. Then the bad news came—the ship with our howitzers and two-thirds of our multiple-launch rocket system (MLRS) launchers had put back into port for repairs and would be 20 to 30 days late in arriving. I now had a major decision to make. Should we stay in the relative comfort of Daharan or get out of "Scud Alley" and move to the desert?

Two important NTC lessons influenced my decision to move to the desert. First, it takes time for soldiers to acclimate and learn to live in the desert. Second, the most difficult parts of combined arms operations are communication links and completely understanding the commander's intent. With this in mind, I asked for an assembly area in the vicinity of VII Corps' planned western move. The area was far enough west that I wouldn't need to move again when the corps started its swing west.

My next concern was losing personnel and equipment as fillers because we didn't have our howitzers and rocket launchers. My previous training with active units taught me to be aggressive and not wait for someone else to decide my fate.

My staff went to work and developed a training plan that would allow the brigade and battalion TOCs to continue coordination and planning with VII Corps Artillery and give our logistics people the opportunity to enter the logistics system. We also offered to form three provisional transportation companies with our heavy expanded-mobility tactical truck (HEMTT) and five-ton assets. These could be used to augment the other brigades in VII Corps Artillery for their move west. The plan was accepted by Brigadier General Abrams, and we became a provisional transportation headquarters until our primary weapons systems arrived.

The next three weeks we conducted brigade and battalion CPXs, finalized planning with VII Corps Artillery and the 1st Infantry Division Artillery (Div Arty), hauled equipment and learned to live in the cold winter desert.

Our howitzers and rocket launchers finally arrived five days before the war started. We immediately called in our trucking companies and moved north to the Iraqi border to fire in artillery raids. When I received our mission for D-Day, I knew we still had the confidence of Brigadier General Abrams. He had not given us a simple mission; instead, it would require flexibility and good coordination to pull it off. Our mission was general support reinforcing (GSR) to the 1st Infantry Div Arty, on order reinforcing the 1st Cavalry Div Arty, on order reinforcing the 1st (UK) Armored Div Arty.

We fired in the preparation to breach the minefields for the 1st Infantry Division, then received the on-order mission to reinforce the 1st (UK) and prepare to receive A Battery, 1st Battalion, 158th Field Artillery (MLRS) and two radars. For the next three days, we kept up with the Brits and fired every mission they required. The 142d traveled more than 300 kilometers while delivering 422 tons of cannon and rocket munitions on the Iraqi Army. Our operational readiness rate never dropped below 95 percent. Our LTACFIRE and MDS gave us capabilities we never dreamed of during peacetime training.

Post-mobilization

The 142d has been home almost two years now, and Desert Storm has affected all of our lives in some way. Approximately 10 percent of our soldiers retired or did not choose to re-enlist. They have been replaced by good young soldiers who will carry on the 142d tradition. All units of the 142d FA Brigade are at or above 100 percent strength, morale is high and many war stories have been embellished to the point of sounding like new stories.

We had a lot of good luck, tremendous support and were fortunate to bring all of our soldiers home. We worked hard and completed our mission in a professional manner. Fort Sill, III Corps Artillery and VII Corps accepted us as part of the Total Force. For that, we will always be grateful and proud. The 142d FA Brigade, Arkansas Army National Guard, is again ready to *Answer the Call.*

Colonel Charles J. Linch, ARNG, is the Commander of the 142d Field Artillery Brigade, Arkansas Army National Guard, which he commanded during Operation Desert Storm. His previous assignments include S3 and S4 of the 142d Field Artillery Brigade and Commander of the 1st Battalion, 142d Field Artillery. He has held many National Guard positions, including Communications and Electronics Staff Officer, Liaison Officer, Fire Direction Officer and Operations and Training Staff Officer. He also commanded A Battery, 2d Battalion, 142d Field Artillery. He's a graduate of the University of Arkansas and is self-employed as co-owner of a real estate agency.

Deployment Success—

A Senior NCO's Perspective

by Command Sergeant Major
William J. Perry III

The soldiers of the 25th Division (Light) Artillery-"Tropic Thunder"-out of Schofield Barracks, Hawaii, stay prepared for the call that may deploy them anywhere in the world. A unit's success remains the sum of how well its people are trained. Although no one factor can be singled out that leads to a unit's success, those units that focus on the basics generally enjoy far greater results.

This article contains no magic formulas and probably nothing extraordinarily new for most readers. There are many issues regarding deployments that are better left to the "experts"—details of the unit status report, readiness standing operating procedures (RSOPs), unique logistical challenges and the movement business. Presented here are some issues that contribute to deployment success as viewed from the perspective of a senior NCO.

Family Support Groups

A genuine concern for the soldier's family is a basic tenet of good leadership. Family support groups (FSGs) can have a dramatic impact on an organization. Although regulations require commanders to have FSGs, a commander is powerless to direct spouse participation. FSGs can be viewed as a measure of the quality of the relationship between the unit and its spouses.

Like most units in the 25th Division Artillery (Div Arty), relationships begin with a strong sponsorship program that includes meeting the new soldier and his family at the airport. As a matter of policy, no new soldier is deployed until his family is established in its new home. A representative from the FSG makes contact with the family soon after arrival. This kind of concern isn't soon forgotten by the new family and will pay dividends in the future. These gestures demonstrate concern and begin to build the relationship between the organization and the family that's so critical during unit deployments.

"Deployment" ought to be part of the official unit designation for the 25th Div Arty. This Div Arty deployed all four of its battalions in the first three months of the year—two to the Pohakuloa Training Area (PTA) on the "Big Island" of Hawaii, one to Team Spirit in Korea and one to the Joint Readiness Training Center (JRTC) at Fort Chaffee, Arkansas. In addition, we sent a battery to the National Training Center (NTC) at Fort Irwin, California, another to PTA and supported an infantry battalion external evaluation—also in the first three months of the year. Finally, we sent smaller elements to a half dozen other places around the world during the same time. We were successful in no small part because of FSGs, and because when appropriate, we incorporated their concerns into our deployment planning process.

Personnel Management

Many aspects of personnel strength management are beyond a unit's control. The only options available to a unit are to use tools such as the monthly unit status report and memos highlighting critical shortages sent either through staff or "green tab" channels to decision-makers who can affect personnel issues. However, many managers have become desensitized to the issue of shortages and, frankly, are only interested in "show stoppers." So the goal is to have a fair distribution of the available resources ensuring all organizations share an equal amount of "challenges."

We try to be alert to the consequences of unnecessary movement of soldiers between sections. Stability—not stagnation—of soldiers enhances winning teams. The staff sergeant section chief has a full plate without unit leaders creating unnecessary burdens for him. The decision to move soldiers must carefully consider the effect on readiness for each section involved. The bottom line is that personnel moves need to be for the right reasons and at the right time.

Excessive movement within a howitzer section can create an unsafe firing condition. As a matter of policy in this Div Arty, moving a section chief, gunner or more than two cannoneers causes a howitzer section to become decertified until a section evaluation can be administered. This forces leaders to consider the consequences of personnel moves, tracks sections as combat systems, enhances firing safety and protects the battery leaders from arbitrary movement decisions.

Administrative Readiness

Forms, papers and floppy disks must be prepared before the first soldier can get on an airplane. Administrative preparedness begins with the first-line leader. The soldiers' section chief ensures identification cards and tags are straight, wills and power of attorneys are prepared, immunizations are up-to-date, a soldier has two pair of glasses and protective mask inserts and the multitude of other tasks regarding administrative readiness are completed.

All administrative requirements are verified as part of the mission pre-assumption activities. There should be very few "frustrations" if section chiefs have kept up with their responsibilities. Unfortunately,

A C-141 Preparing for the Deployment of Lightfighters. The mission to have "Wheels up" in 18 hours is real and taken seriously by even the newest arrival to the unit.

An M198 Howitzer Section Conducting a Direct Fire Mission. Perhaps the toughest challenge is training new commanders to appreciate the relationship of section evaluations to trained howitzer sections and of trained sections to battery successes.

there's no simple solution to this important aspect of deployment preparedness. At present, the process is fairly burdensome for those who are routinely involved in the paper business—the Personnel Administration Center (PAC) clerks and first sergeants. We're continuously evaluating the process with an eye on reducing the paperwork and eliminating redundant requirements.

Physical Fitness

Each day begins with physical fitness—as is true for most light organizations. Many individual and section tasks are very labor-intensive in the light artillery. Fire support teams (FISTs) operate and live out of their rucksacks and most often travel by foot. Cannoneers, with their sledge hammers, shovels and sand bags, live an equally tough field existence. Our unit leaders are physically fit and set the example in tough and challenging physical training (PT) programs. Physical fitness sets the tone for the day, supports the mission and is a soldier's best defense against injuries.

One aspect of the light artillery physical fitness challenge is to keep soldiers off the "injured reserve rosters." Some would argue that the differences and needs between heavy and light artillery in terms of fitness is just a lot of hype. Perhaps, in theory, all soldiers are expected to be equally fit and capable of sustainment under tough and rigorous conditions. However, there is a reality gap that results in a culture shock for the newly initiated.

Light organizations simply can't afford to lose people through preventable injuries resulting in limiting profiles. The effect of one lost soldier in a howitzer section means extra labor for the remaining cannoneers; and for the company FIST, it means carrying the tools of the trade in one rucksack instead of two. The bottom line is

that physical fitness training is a force multiplier we must continuously improve.

Policies, Programs and Procedures

Like any successful enterprise, whether it's a football team or local department store, a written plan is essential in outlining the objectives and criteria for success. Similar to a franchise and for many of the same reasons, policies, programs and procedures in an organization should be standardized. Our Div Arty submits to this philosophy but continues work in several areas.

In terms of written plans, our goal is to create a document that crosswalks the mission-essential task list (METL) through individual tasks—military occupational specialty (MOS), common and leader. The document would include any relevant programs to the particular career field, such as the standardized gunner's test and section evaluation for cannoneers. This document, along with individual training records, then becomes the section chief's "plan" or leader's book. We then can use the format to develop leader's books for other career fields.

No piece of paper is a substitute for the bottom line—well-executed individual-and section-level training. We must recognize the success of trainers by providing programs that challenge them in the performance of their tasks and missions—section evaluations are good examples. Of course, we're also interested in those who are struggling to meet the standards. These programs become the unit's METL-based training objectives and provide the trainer his task list.

Training

There's no magic to our training strategies and programs. Like many other

divisions, the 25th Infantry Division incorporates the three-cycle system of training management—mission, support and training. Most of our individual- and section-level training programs receive their greatest emphasis during the mission cycle. The section evaluations and gunner's tests are administered during each mission cycle. This equates to about three iterations of these evaluations per year. Perhaps the toughest challenge is training new commanders to appreciate the relationship of section evaluations to trained howitzer sections and of trained sections to battery successes.

The mission cycle also provides the opportunity to assess our critical systems. From howitzers and fire direction to fire support and lasing, all soldiers, leaders, teams, sections and batteries are susceptible to a "no-notice" assessment. Results are used to validate training readiness and develop future training plans.

We place a great deal of emphasis on the individual's responsibility to stay deployable at all times. We want soldiers to accept responsibility for staying proficient in their primary MOSs (PMOSs) and skill levels. The mission to have "wheels up" in 18 hours is real and taken seriously by even the newest arrival to the unit. Perhaps the meaning of the light organization is best conveyed to the soldiers through the mission assumption process. The message the soldiers hear is loud and clear—the organization is readying for deployment.

Executing a successful deployment requires a great deal of planning and preparation. Deployments come in many different shapes and sizes. Training-related deployments offer many challenges but cannot replicate the conditions that stress the emotions of families and test the mental toughness of soldiers. Keeping the basics in focus is the only sure formula for success.

Command Sergeant Major (CSM) William J. Perry III serves as the CSM for the 25th Infantry Division (Light) Artillery at Schofield Barracks, Hawaii. Prior to his current position, he served as the CSM of the 7th Infantry Division (Light) Artillery, Fort Ord, California. He was the CSM of the 6th Battalion, 8th Field Artillery at Fort Ord when it deployed to Panama in Operation Just Cause in December 1989. Other assignments include First Sergeant, Operations Sergeant and Fire Support Sergeant from the company to brigade.

Deployment Readiness—
What it Takes to Make the Eagle Fly

by Colonel Geoffrey D. Miller and Lieutenant Colonel Clyde A. Page

As fire supporters for the US Army's only air assault division, the Redlegs of the 101st Airborne, Fort Campbell, Kentucky, are uniquely skilled in maintaining the highest degree of deployment readiness. We take pride in our contributions to a tremendously successful division history and focus on continuing that proud heritage. Deployment readiness is a way of life at Fort Campbell.

This article discusses the division's readiness mission and how it permeates every unit, garrison activity and family on post. It also illustrates the training and support philosophy required to forge and maintain our readiness edge.

Deployment Philosophy. The Screaming Eagles stand ready to rapidly deploy worldwide with a combined arms task force within 18 hours after no-notice alert and conduct an air assault forced entry to accomplish the mission and the commander's intent. Because of the time

constraints of no-notice contingencies, the division focuses on strategic deployment by US Air Force airlift or self-deployment by organic helicopters.

Our deployment readiness efforts are driven by several considerations. First, our readiness plans are based on a "come-as-you-are" requirement. There may be neither time for additional training nor the opportunity to fill personnel or equipment shortages. Instant readiness is a mission-essential task in this environment. Second, our brigade combat teams (the division's "teeth") focus solely on the tactical mission while our deployment support (the "tail") becomes the overriding priority for

every non-deploying soldier and Department of the Army civilian at Fort Campbell.

Deployment readiness is costly in terms of leader time, focus and energy. It also takes a great deal of soldier time to train to meet the requirements, maintain deployment administration and continually follow up. Meeting the standard means constant monitoring. However, without constantly reading the deployment "pulse," deployment readiness suffers.

A key to success is the division readiness standing operating procedure (RSOP), a very detailed, thorough document to help units prepare for deployment, that provides a "cookbook" approach to procedures (see

Figure 1). The RSOP ensures continuity as leaders change and prevents a rather complex process from being misunderstood. Its completeness also makes the RSOPs at subordinate levels less voluminous.

> ❑ Concept of Deployment
> ❑ Required Preparation
> ❑ Deployment Assistance
> ❑ Notification-Hour Sequence
> ❑ Checklists
> ❑ Reports

Figure 1: The division RSOP provides detailed instructions about all of these areas.

Training for Deployment. We have three types of six-week training cycles—gold, black and white. Somewhat similar to the green, amber and red periods described in Chapter 3 of *FM 25-101 Training the Force: Battle Focused Training*, these cycles facilitate maintaining combat readiness and training for deployment.

The division has two types of task forces. The division ready brigade (DRB) is configured around an infantry brigade and is a combined arms task force. Brigades are designated as DRB-1, DRB-2 and DRB-3 to indicate priority for deployment. Priorities are rotated according to training cycles—1-black, 2-gold and 3-white. The division ready force (DRF) is built around an infantry battalion and also is a combined arms task force. Infantry battalions are designated as DRF-1 through DRF-9 to indicate their priority for deployment. These battalions rotate priority roles as indicated by their brigades.

Training cycles progress from gold to black to white. The progression allows us to maximize the strengths of each period. For example, our black deployment cycle comes after the most intensive, realistic training period possible—gold. This ensures that if our soldiers deploy, their state of training is at the highest level. The pattern of cycles regularly exercises and refines all portions of our RSOP.

The gold cycle allows maneuver brigade commanders to synchronize the brigade combat team. Direct support (DS) Field Artillery battalions integrate their training objectives into the overall brigade plan to foster synchronizing fire support and maneuver. Brigades routinely spend 18 to 21 days continuously in the field, each

with at least 95 percent of its assigned strength.

All gold cycle field training exercises begin with an alert, marshal and deployment to an area of operations. The urgency and stress of this period immerses soldiers in realistic tactical operations for that 18-to 21-day period. Field Artillery battalions concentrate on collective fire support tasks and gunnery. Combined arms live-fire exercises (CALFEXs) and close support missions are integrated into gold cycle training, and we conduct our Eagle Fires IV (battalion-level) combined arms, live-fire external evaluations.

Units in the black cycle are the first to deploy. Black-cycle events certify the standards achieved during the gold cycle. Emergency deployment readiness exercises (EDREs) stress our strategic load-out capabilities and are conducted up to 72 hours before the black cycle starts. Black cycles focus on battery-level training and section certification, such as battalion base-piece exercises and fire coordination exercises. We conduct division artillery command inspections (CIs) of battalions during the black cycle as well as master section competitions. The division has a goal of 90 percent air assault school graduates, and most of the course allocations are during the black cycle.

White cycle priorities are mission support, soldier wellness and leader development training. Two firing batteries per battalion and a portion of the headquarters and service battery take a two-week block leave during this cycle.

Training Requirements. Key training events sharpen our combat and deployment readiness. They do so by routinely exercising all aspects of fire support and greatly enhance our come-as-you-are posture by assuring tactical expertise. The following paragraphs describe a few of the most critical training events.

The division conducts Eagle Talon, a division command post exercise (CPX) three to four times a year to exercise the division battle staff and our command and control capabilities. The division artillery participates and exercises all facets of the division's fire support systems. Eagle Talon exercises are the test-bed for the division's "Air Assault Battle Notes," which summarizes those tactics, techniques and procedures (TTPs) that have been approved but not yet incorporated into the division SOP.

Regular Combat Training Center (CTC) rotations are premier battalion training events. They allow us to completely synchronize fire support and maneuver.

Battalions scheduled for CTC rotations conduct train-ups with full observer-controller packages, which may be tasked from white-cycle battalions.

Red Eagle fire support exercises train brigade and battalion fire support elements (FSEs) to synchronize fire support. We conduct them twice a year; the winter exercise emphasizes brigade FSE training, and the summer exercise integrates battalion and brigade FSE operations. All CPXs train fire support channels from the division to the battalion levels, using the lightweight tactical fire direction system (LTACFIRE).

Our fire coordination exercises (FCXs) assess and train a maneuver company commander's ability to coordinate direct and indirect fires in a combined arms team. Each FCX is tailored for the unit, based on its resources and training proficiency.

Administrative and Logistic Readiness. The complementary piece to tactical proficiency is administrative and logistical sustainability to execute deployment. There are a thousand pieces in the latter arena that must be checked to ensure we're ready to go at "wheels-up" time. At the middle and end of each month, battalion commanders report their deployability status to the division artillery commander. Maintaining deployability is a lengthy, unforgiving process that requires constant command emphasis. Its primary factors are personnel, medical and equipment readiness.

Before assuming DRB status (black cycle), each Field Artillery battalion executive officer (XO) provides the division artillery XO a prioritized list of personnel and equipment shortages and all non-mission capable combat-essential equipment. Battalions also verify they've completed 100 percent preparations of replacements (PORs) for overseas movement, updated unit movement plans and rear detachment plans (for example, disposition of personal property and privately owned vehicle, or POV, storage), completed weapons qualification, updated their air assault qualification status and reviewed convoy requirements and procedures, prescribed load list (PLL) zero balances and recall plans, both for individuals and units in training. Also, before starting the black cycle, each unit must update its alert roster.

Personnel deployability criteria require those items shown in Figure 2, Page 20. Keeping these items current requires constant attention, usually in the form of a monthly POR update. Soldiers with incomplete or outdated packets are

identified; the division artillery S1 coordinates with both the division G1 and Finance to arrange for contact teams to come to division artillery classrooms so deficiencies can be corrected, usually on-the-spot.

Personnel Deployability

- Updated DD Form 93 (Record of Emergency Data)
- VA Form 8286 (Servicemen's Group Life Insurance, or SGLI)
- Properly Sealed Identification Card
- Identification Tags
- POV Disposition Instructions
- Approved Family Care Plan (As Needed)

Medical/Dental Deployability

- Immunizations
- HIV Test
- Physical Exam
- Panoramic X-Ray
- Dental Category 1 or 2

Figure 2: These items summarize the 101st Airborne Division's personnel and medical requirements for deployment.

The key is battery leaders regularly screen their soldiers to flush out the myriad problems that arise. Relatively minor finance discrepancies may be exacerbated in the face of deployment. Similarly, family care plans must be initiated and continuously reviewed. Family situations often change, and a care packet that isn't properly maintained may contain outdated information. A positive, proactive dialogue with soldiers and close examination of their packets are essential.

Medical deployment criteria include immunizations, HIV testing and physical examinations. All soldiers processing into the division have their shots updated and receive a dental screening before they're assigned to major unit commands. Dental deployability requires every soldier have a current panoramic x-ray on file at the central panograph storage facility, a complete dental record on file at the clinic and be in Dental Category 1 or 2. Dental Category 3 soldiers pose the greatest challenge as they may require several appointments to upgrade their status and must be monitored closely through the appointment and follow-up process. Battalion aid stations give shots in both the field and garrison to keep soldiers current.

Birth month audits are important to deployability. They include officer record brief and personnel record reviews and annual physical and dental exams. These checks are a matter of command interest for both the division artillery and division.

Our attitude about vehicle and equipment maintenance is best summarized as "there'll be no time to fix problems tomorrow when we roll out of the motor pool tonight." The division locks in a brigade's maintenance priorities with the main support battalion before the brigade's black cycle. Similarly, the battery supporting the DRF-1 has priority of maintenance with the forward support battalion, which is coordinated 10 days before assuming DRF-1 status. The main support battalion is prepared to accept any maintenance overflow and (or) missions the forward support battalion can't.

Battalions maintain current strategic load plans for C-5, C-141 B and C-130 aircraft. Plans are prepared by IBM-compatible computers using CALM Version 5, a computer-aided load planning program. Battalion load plans are revalidated at the division transportation office every 90 days. Automated unit equipment listings (AUELs), computerized rosters of battalions' equipment, are verified at the installation transportation office annually or as changes occur, such as a modification table of organization and equipment (MTOE) change.

System Assessment. Our tactical readiness is evaluated during both gold and black cycles. Battalion external evaluations—Eagle Fires IV—are very demanding 10-day exercises that evaluate unit readiness to execute combined arms fire support for the air assault task force. These gold-cycle events feature home-station, high-resolution, force-on-force maneuver training integrating gunnery and fire support in a mid-intensity scenario. During the "road-to-war" phase of Eagle Fires IV, each battalion completes a 100 percent load-out for strategic deployment. During a black cycle, a battalion participates with its affiliated brigade in at least one EDRE evaluated by the division or corps.

The sustainment piece of combat readiness is evaluated during CIs. The inspections provide the commander a detailed analysis of his administrative, logistical, training administration and maintenance postures. The inspection examines the degree to which a unit complies with established guidelines, policies and standards in accordance with AR 1-201 Army Inspection Policy. The depth of the inspection is indicated by the fact that a battalion CI will examine 160 areas and take five training days to complete. All areas rated "not to standard" are reevaluated within 30 days.

Conclusion. Deployability is a seven-day-a-week, 24-hour-a-day mission, but our strategy clearly has been successful. During EDREs, Eagle Flights IV and many off-post exercises, the payoff is our ability to meet the rapid deployment standard.

Considerable unit and leader focus drive these demanding training and sustainment requirements. The costs of deployment readiness are reflected primarily in the energy our soldiers and leaders devote to it. We achieve success with leaders and soldiers who are "part of the solution." Another essential aspect of deployment readiness is a tremendous amount of detailed work and cooperation between the division artillery and division and installation staffs.

The Field Artillery is famous for attention to detail. Deployability is a tremendous opportunity to develop leaders who have that emphasis. The 101st Airborne Division stands combat-ready, and deployment focus is an indispensable ingredient to our success. ***Guns of Glory!***

Colonel Geoffrey D. Miller commands the 101st Airborne Division (Air Assault) Artillery, Fort Campbell, Kentucky. In his previous assignment, he was a Chief of Staff of the Army Fellow in Foreign Policy Studies at the Brookings Institution in Washington, DC. His other commands are the 5th Battalion, 15th Field Artillery, 7th Infantry Division (Light), Fort Ord, California, three batteries and a special training company. Among other assignments, Colonel Miller served as a Staff Officer in the Office of the Deputy Chief of Staff for Operations and Plans, Washington, DC, and as Assistant Professor of Military Science at Stephen F. Austin University, Nacogdoches, Texas.

Lieutenant Colonel Clyde A. Page is the Executive Officer of the 101st Airborne Division (Air Assault) Artillery. He served as the Executive Officer and S3 of the 1st Battalion, 12th Field Artillery and as Executive Officer of the 3d Battalion, 321st Field Artillery in the Field Artillery Training Center, both at Fort Sill, Oklahoma. Lieutenant Colonel Page commanded C Battery, 1st Battalion, 2d Field Artillery in the 8th Infantry Division (Mechanized) in Germany. He's slated to assume command of the 1st Battalion, 320th Field Artillery in the 101st Division this month.
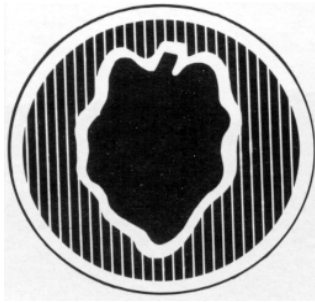
Deploying for Victory

by Colonel William J. Lennox, Jr. and Lieutenant Colonel John M. House

There's a good possibility that the first round of the next major conflict involving American forces will be fired by a 24th Infantry Division (Mechanized) Bradley fighting vehicle, Abrams tank or howitzer. History has shown this to be the case in World War II, Korea and Operation Desert Storm. We in the Victory Division, Fort Stewart, Georgia, are proud of our heritage and take the mission of readiness and deployability seriously. We've learned important lessons from our 1990 deployment to the Middle East and have put together a sound plan for the future that we upgrade continuously.

Operation Desert Shield

The deployment to Saudi Arabia included several unique challenges. Though the division had a plan, we did not have a reason before Desert Shield to carry out such a massive deployment. When it came time to deploy, much of the equipment for one direct support (DS) Field Artillery battalion and one mechanized infantry battalion was on a train returning from a National Training Center (NTC) rotation at Fort Irwin, California. One of our armor battalions had virtually ceased to exist due to a cohesion, operational readiness and training (COHORT) rotation of its companies to Korea. There were other complications—we faced an enemy with years of combat experience, one who was apparently willing to use chemical weapons.

The majority of the division's initial effort focused on preparing equipment at Fort Stewart for deployment (including that on trains returning from the NTC) and closing billets and offices. The division staged equipment at the rail marshalling area for ammunition upload and transportation to the port of Savannah. Units restocked supplies in vehicles returning from the NTC. Wheeled vehicles staged at Wright Army Airfield on Fort Stewart for convoy movement to Hunter Army Airfield (HAAF) in Savannah. The port support activity (PSA) called forward

3d Battalion, 41st Field Artillery vehicles at Garden City Port in Savannah, Georgia.

convoys from HAAF as ships became available. Units sent drivers to the PSA to ensure vehicles were safely loaded.

The 2d Brigade deployed first, but it took the 3d Battalion, 69th Armor instead of the 4th Battalion, 64th Armor due to the COHORT problem. This caused fire support teams (FISTs) administrative problems because 1st Battalion, 41st Field Artillery and 3d Battalion, 41st Field Artillery swapped task force FISTs. Because the division never restored the brigades to their Fort Stewart configuration, this caused hand-receipt and personnel-action irritants.

The division artillery (Div Arty) units moved to buildings in the National Guard area to isolate their soldiers from distractions. After several days, we realized the move was unnecessary because there were about two weeks between initial ship boarding and flights to Saudi Arabia. Additional supplies remained in our offices, and the Guard area was cramped. People returned to headquarters and billets, and those with families spent non-training time with their loved ones—a morale factor when facing a war.

As far as training was concerned, the

Div Arty borrowed a battery of M109 howitzers from the National Guard to fire a few rounds and "shake out" crews. The result was more confidence building than anything else. The majority of training focused on the nuclear, biological and chemical (NBC) threat.

Never had American soldiers paid more attention to chemical defense than during those days. The division was convinced we would fight "dirty." The chemical officers and NCOs were mentors for everyone. Every training event at Fort Stewart and in Saudi Arabia after deployment included NBC conditions.

The training program in Saudi Arabia included activities such as battery and battalion field training exercises (FTXs), maneuver brigade command post exercises (CPXs) and FTXs, live firing at the division's range complex, small-arms qualification and battery external evaluations. Daily fire support rehearsals ensured an effective defense of assembly areas. Tactical rehearsals at battery through division levels honed plans and trained units to execute them. Only imagination and ammunition limited training. By the time

it crossed into Iraq on 24 February, the division was ready.

As a result of lessons learned in the Gulf War, the unit has reworked its deployment concept.

The Division Ready Brigade Concept

As the Army faces this new period of strategic uncertainty, the 24th Infantry Division is well-positioned to be a major player, set in an area that can be characterized as a strategic launching platform. The ports of Savannah, Georgia; Charleston, South Carolina; and Jacksonville, Florida are close at hand, and Hunter Army Airfield provides air access. In fact, the port of Savannah is to the 24th Division what Pope Air Force Base in North Carolina is to the 82d Airborne Division.

To fulfill its mission to provide a heavy force in response to any crisis the XVIII Airborne Corps might face, the division established its division ready brigade (DRB) concept. This graduated response provides several levels of force from a modest degree of reinforcement for a light unit already in country to a full heavy brigade. The step-by-step progression puts an initial ready company (IRC) with an Abrams platoon and a Bradley platoon in the air in 18 hours. This force significantly increases the firepower available to a light battalion.

The division ready force (DRF) flyaway can be in the air in 48 hours with a battalion headquarters and two heavy companies, each with two platoons (supplemented on arrival by the two platoons of the IRC). A sealift DRF is also available for loading within 48 hours. It has a task-organized maneuver battalion, an M109A2 howitzer battalion with AN/TPQ-36 Firefinder radar and other combat support and service support elements.

The final package before the complete division moves is a three-maneuver-battalion DRB. The habitually supporting DS (M109A2) battalion and other related "slice" elements deploy with it. Depending on aircraft and ship availability, elements of the division can be well on their way to any point on the globe within a day by air or a week by sea.

Each deploying maneuver force carries an appropriate Field Artillery contingent to provide fire support. The IRC deploys with its company fire support officer (FSO). Unfortunately, the expected number of C-5 aircraft available precludes taking a fire

3-41 FA fire support team vehicles returning from Saudi Arabia. The port at Savannah is to the 24th Division what Pope Air Force Base is to the 82d Airborne Division.
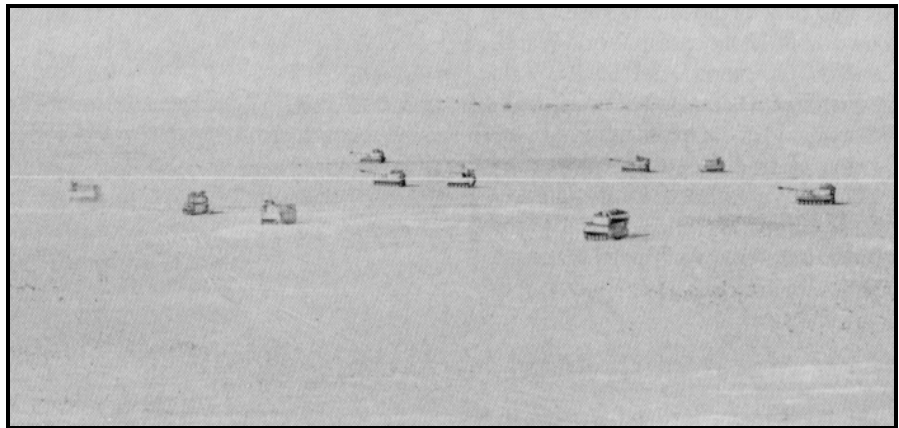
3-41 FA conducting operations in Saudi Arabia during Operation Desert Shield.

The training program in Saudi Arabia included battery and battalion field training exercises, battery external evaluations and small arms qualification.

support team vehicle (FISTV). The DRF flyaway, DRF sealift and DRB packages include the normally associated fire supporters and equipment.

Several additional air and sealift deployment modules exist to enhance the capability of the basic DRF/DRB force. Field Artillery air modules include a howitzer platoon, a multiple-launch rocket system (MLRS) platoon with AN/TPQ-37 Firefinder radar, a meteorological section and a DS battalion command and control element. All air packages also can go by sea with the option of increasing their size to include the complete parent unit. Other combat support and service support modules exist to provide the force commander the greatest flexibility possible
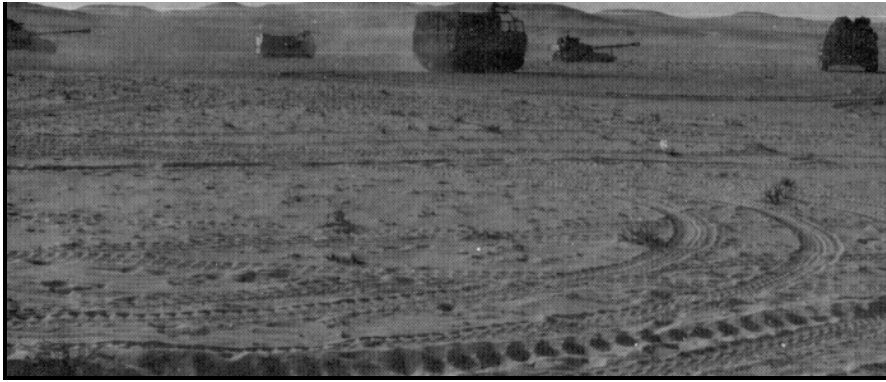
Early fire support rehearsals ensured an effective defense of assembly areas. Tactical rehearsals at battery through division levels honed plans and trained units to execute them.

The ports of Savannah, Charleston and Jacksonville are all close to the division, providing a strategic launching platform for sea-deployment.

refine these force packages and revise plans. Ammunition, for example, must be carefully worked. We're currently relooking basic loads and upload procedures. Because all ammunition is transported to a central location where Bradleys, tanks and artillery vehicles upload, the plan has to be developed carefully for safety, speed and efficiency.

Artillery vehicle loads have to be tailored for proper ammunition, propellant, fuses and small arms. Projectiles and powder have to be broken down by square weight and lot, and calibration data kept for lots on hand. This data has to be tracked carefully as ammunition is rotated.

We're also looking at increasing the number of FISTVs in the early air packages. FISTs with ground/vehicular laser locator designators (G/VLLDs) can prove effective in unstable circumstances where Navy and Air Force, as well as Army, weapons are available.

In the future we will continue our efforts. If heavy forces are needed, either to reinforce units already on the ground or to provide massive ground firepower, the Victory Division is ready. The division will provide heavy forces wherever and whenever needed.

We of the Victory Division are proud of our history and are dedicated to playing our part. *First to Fight!*

in selecting the appropriate force to respond to the crisis at hand.

Deployment Readiness

Readiness requires a great deal of work and practice. The deployment effort includes ensuring family support groups are informed, family care plans are prepared, battle rosters are established, soldier readiness processing is completed, task force reports are accurate, non-deployables are tracked, personnel shortages monitored, rear detachments prepared and manifests set. Movement officers have to be experts, and automated unit equipment lists must be tracked meticulously.

Practice includes not only the ready unit's rehearsing actions, but all units practicing their parts in the alert sequence. Twice annually the division performs a day-long deployment exercise (DEPEX) for key personnel. The DEPEX runs through all actions for all contingencies, starting from both Fort Stewart and Fort Benning, Georgia, and ending at Hunter Army Airfield and the port of Savannah. Besides 24th Infantry Division soldiers, participants have included representatives from the Military Traffic Management Command, Army Staff and Coast Guard.

As a result of its work, the division has exceeded expectations. The 24th has deployed the IRC twice, beating its time line both times. We also practice these deployment procedures for rotations at the Joint Readiness Training Center (JRTC) at Fort Chaffee, Arkansas, and for joint exercises like Ocean Venture, and we've proven our capability to get heavy forces to critical areas in a timely fashion.

Continuous Effort

The division and Div Arty continue to

Colonel William J. Lennox, Jr. commands the 24th Infantry Division (Mechanized) Artillery, Fort Stewart, Georgia. His previous assignments include commanding the 5th Battalion, 29th Field Artillery, 4th Infantry Division (Mechanized) at Fort Carson, Colorado. Colonel Lennox has served as Special Assistant to the Secretary of the Army and as a White House Fellow, both in Washington, DC. He also has held many Field Artillery command and staff assignments in Europe and in the continental US.

Lieutenant Colonel John M. House, until this month, was the Executive Officer of the 24th Infantry Division (Mechanized) Artillery. His previous assignments include duty with the 1st Armored Division in Germany and the 82d Airborne Division at Fort Bragg, North Carolina. Lieutenant Colonel House is a graduate of the Command and General Staff College and the Advanced Military Studies Program, both at Fort Leavenworth, Kansas. He will take command of the 6th Battalion, 29th Field Artillery (Multiple-Launch Rocket System) in the 1st Armored Division this month.

Survey for Remote Areas

by Staff Sergeant
Dwight D. McKillip
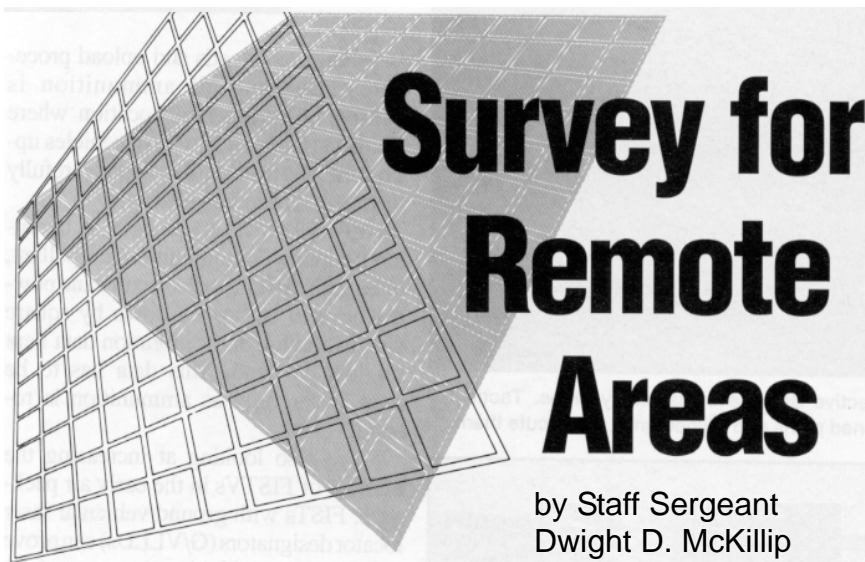
We're familiar with the five requirements for accurate predicted fires, and we know that, used together, they equal first round fire-for-effect (FFE). Accurate target, observer and piece location sound very simple. But once we throw in some distractions—zone-to-zone transfers, different datums, using geographic coordinates—something that sounds simple actually is more involved.

In day-to-day operations, we seldom train to overcome these obstacles. Most Redlegs operate using Universal Transverse Mercator (UTM) coordinates, seldom work in areas where two grid lines do not join and never have "datums" cross their minds. During Operations Desert Shield and Storm, the artillery community found out very quickly we had a training shortfall in these areas.

S outhwest Asia (SWA) presented one of the first opportunities to function in a combined/joint theater of operations. We learned how to initiate operations in remote unmapped areas and the relevance of a common grid. We found the allied forces, different services and individual units all used their own maps or mapping systems with different datums. We discovered that zone-to-zone transformations and datum conversions weren't as simple as we expected. Probably the most important lesson we learned was the Field Artillery Surveyor (82C) is critical in helping to overcome these obstacles.

Addressed in the remainder of this article are some of the obstacles you'll face deploying to remote areas and how you can overcome them. As Redlegs, you must accept the critical task of keeping personnel trained to overcome these obstacles, making operations while facing them second nature.

Preparing for Deployment

There are things you can do to prepare for survey operations when deploying to remote areas. Before departing from home station, make sure your unit standing operating procedures (SOPs) identify survey elements as advance party personnel. In addition, all survey table of organization and equipment (TOE) should deploy a minimum of one theodolite and two backup computer systems (BUCS). The BUCS should have fresh batteries, an ample supply of replacement batteries and the time module updated and running prior to leaving. You must not count on a timekube receiver being able to give you an accurate time reading in a remote location.

Units can research and collect survey and map products related to the deployment area. They can collect maps and trig lists from the Defense Mapping Agency

(DMA) and topographical engineer support.

You need to know whether or not the global positioning system (GPS) will be available and usable in the remote area and ensure your soldiers understand the benefits and limitations of the systems. For example, the Department of Defense has implemented selective availability (SA)—changing the GPS systems' accuracy level from that experienced by units in Operation Desert Storm. With the change to SA, the small, lightweight GPS receiver (SLGR) is useful for navigation but not for positioning Field Artillery weapons systems. The new precise lightweight GPS receiver (PLGR), beginning fielding in FY 94, will be able to position most artillery systems. (See the article "Tactically Employing Today's SLGR" by Charles E. St. Clair on Page 46).

The commander will make a decision as to what datum the unit will use. But it's also very helpful to find out what datum the joint forces will be using (as applicable).

"Datum" is an often misunderstood term. But before you can understand datum, you must understand "ellipsoid"—often confused with datum. The ellipsoid is a mathematically smooth surface (earth) that cartographers use to project a coordinate system and perform measurements. Map makers have developed or selected an ellipsoid that best fits the earth region to be mapped or surveyed. There are at least 16 ellipsoids in use today.

A datum is nothing more than a point of beginning on the ellipsoid. It defines for the user a cohesive set of survey control. All survey positions in one datum are reduced to a common grid reference with certain prescribed accuracies. It ensures the user that *all* control is consistent and common to one grid.

Survey Problems and Solutions

With each deployment to a remote location, conditions are unique. The following address some problems you may encounter and their solutions.

Geographic Coordinate Conversion. "Coordinate system" is another misused term. It's a set of rules that specifies how coordinates are assigned to points. In other words, it's a way of naming or labeling a particular location. The Geographic Coordinate System names a point in terms of latitude and longitude, and the UTM Coordinate System names a point in terms of easting and northing. But just because two points are of the same naming convention

(ie: easting and northing) doesn't assure they're on the same datum.

Envision a scenario where there's no survey control in the remote area into which you're going and the maps of the area are all in geographic coordinates. If so, BUCS with the Survey Module, Revision 1, can convert the geographic coordinates (GEO COORDs) to UTM quickly. Without BUCS, conversion is complicated and time-consuming but possible.

The information in the box on this page, "Converting Geographic Coordinates to UTM," takes you through the steps involved in the BUCS conversion procedures. The procedures are recorded on DA Form 5600-R Computation—Conversion of Geographic Coordinates to UTM Coordinates (BUCS), also shown in the box below.

Once you've converted GEO COORDs to UTM coordinates, you have the initial control point to provide common grid for all elements in the fire scheme. From this established survey control point (SCP), you can extend survey control to all elements, including other units as they arrive and become subordinate to yours. Thus, all are on a common grid.

If a higher echelon takes over, it will extend survey control to your area. You would need to tie into its survey scheme and convert your survey data to the higher echelon's data. This may include a shift in datum information.

Converting Geographic Coordinates to UTM

BUCS with a Field Artillery Survey Module can convert GEO COORDs to UTM in two situations: the trig lists give GEO COORDs only and maps are in GEO COORDs only. The computation of conversion from geographic to UTM coordinates is performed on DA Form 5600-R using BUCS (see the form). You determine the correct spheroid for a particular locality by referring to local trig lists, maps or higher headquarters. (For more information, see *FM 6-2 Field Artillery Survey*.)

Referring to the form, follow the conversion steps as listed in the far left column of the form. The form is filled out for the RYON area, which is a southern portion of Oklahoma.

Step 1. The procedure is CALL PROGRAM 10. Enter the Survey Module and Call Program 10.

Step 2. The prompt GEO/UTM/ZONE-ZONE will appear. There's no procedure; just press the endline button to continue the program. (In addition to converting GEO COORDs to UTM as filled out on the form, BUCS can convert UTM to GEO COORDs and transfer zone to zone.)

Step 3. The prompt is SPHEROID CODE: 0: and the procedure is ENTER SPHEROID CODE. You enter the number that corresponds to the spheroid for the local area. You get the type of spheroid from a map of the local area and enter the number listed on the form that corresponds with that spheroid.

Step 4. The prompt is FUNCTION CODE: 0: and the procedure is ENTER 1. The user enters the number of the type of conversion to be performed (also listed on the form).

Step 5. The prompt is LAT(-:S): 0.0000000: and the procedure is ENTER LATITUDE OF STATION. You enter the numbers using geographic coordinates in the following format: DD.MMSS (DD means degrees, MM is for minutes and SS seconds). Two positions are available for the minutes and seconds. If the number of minutes or seconds is less than 10, enter a 0 in the first position for that measurement. Note: If the latitude is in the southern hemisphere, you must enter a negative (-) in BUCS before the latitude.

Step 6. The prompt is LG(-:W): 0.0000000: and the procedure is ENTER LONGITUDE OF STATION. You enter the longitude of the station using the same format as for the latitude of the station: DD.MMSS. Note: If the longitude is in the western hemisphere, you must enter a negative (-) in BUCS before the longitude.

Step 7. The prompt is GRID ZONE: 00: and the procedure is ENTER GRID ZONE. You enter the grid zone in which the point is located. The grid zone can be taken from a map, computed from the longitude of the station or from Appendix D of *TM 5-241-1 Grids and Grid References* or *DMA TM 8358.1 Datums, Ellipsoids, Grids and Grid Reference Systems*.

Step 8. The prompt is EAST: 0.00: and the procedure is RECORD EASTING OF STATION. In this step, record the easting of the station.

Step 9. The prompt is NORTH: 0.00: and the procedure is RECORD NORTHING OF STATION. You record the northing of the station.

Step 10. The prompt is ANOTHER CONV (Y/N): and the procedure is ENTER Y OR N. If you answer "Yes" (Y), the program will return to Step 2. If you answer "No" (N), the program will go to Step 11.

Step 11. The prompt is END OF MSN (Y/N): and the procedure is ENTER Y OR N. If you answer "Yes" (Y), the program will go to SURVEY PGM MENU REV1. If you answer "No" (N), the program will return to Step 10.

GEO COORDs are now converted into UTM coordinates and are relative to the datum of the source.

COMPUTATION—CONVERSION OF GEOGRAPHIC COORDINATES TO UTM COORDINATES (BUCS)

For use of this form, see FM 6-2 the proponent agency is TRADOC

| COMPUTER | SSG DOTY | NOTEBOOK REFERENCE | A 44 | DATE | 15 JUN 93 |
| CHECKER | SFC MOYER | AREA | RYON | SHEET 1 OF 1 SHEETS |

NOTES: 1. IF STEP 10 IS Y, PROGRAM GOES TO STEP 2
2. IF STEP 10 IS N, PROGRAM GOES TO STEP 11
3. TWO CONVERSION PROBLEMS CAN BE RECORDED PER FORM

	INSTRUCTIONS		DATA RECORD	
STEP	PROMPT	PROCEDURE	STATION	STATION
1		CALL PROGRAM 10	PETE	
2	GEO/UTM/ZONE-ZONE			
3	SPHEROID CODE 0 1=CLARKE 1866 2=INTERNATIONAL 3=CLARKE 1880 4=EVEREST 5=BESSEL 6=AUSTRALIAN 7=WGS-72 8=GRS-80	ENTER SPHEROID CODE	SPHEROID CLARKE 1866	SPHEROID
4	FUNCTION CODE 0 1=GEO TO UTM 2=UTM TO GEO 3=ZONE TO ZONE	ENTER 1		
5	LAT(- S) 0.0000000	ENTER LATITUDE OF STATION	LATITUDE 34 04 02 N/S	LATITUDE N/S
6	LG(- W) 0.0000000	ENTER LONGITUDE OF STATION	LONGITUDE 98 24 19 E/W	LONGITUDE E/W
7	GRID ZONE 00	ENTER GRID ZONE	GRID ZONE 14	GRID ZONE
8	EAST 0.00	RECORD EASTING OF STATION	EASTING 554879.62	EASTING
9	NORTH 0.00	RECORD NORTHING OF STATION	NORTHING 3769574.37	NORTHING
10	ANOTHER CONV (Y/N)	ENTER Y OR N		
11	END OF MSN (Y/N)	ENTER Y OR N		

REMARKS

Datums. There are more than 1,000 map datums identified by the DMA, an agency concerned with reducing the number of datums necessary to cover the globe. Until DMA completes this task, you will have many datums to deal with and have to transform datum to datum.

Some areas in the world have more than one datum, and some areas of operation have two datums join. In these areas, it's possible to have a grid misalignment of as much as 1,000 meters from one datum to another.

Many of today's artillery automated systems can't shift coordinates between datums and achieve common grid. Because of a lack of training in survey requirements worldwide, not enough soldiers understand datums well enough to communicate which datum their coordinates are based on.

In many parts of the world, initial control or survey control points (SCPs) don't exist. The GPS may solve this problem. But using GPS with a datum different than your map datum will result in different coordinates for the same location; the GPS coordinates will say you are at one location while the map coordinates say you're at another several hundred meters away. We learned this lesson over and over again in Southwest Asia (SWA): you must have the same datum in your GPS as on your map.

Multiple Ellipsoids and Datums. An area of coverage could look like the one in Figure 1, especially in Third World countries. Because of the historical significance of geo-political boundaries, many areas are fractured in surveying and mapping products. This was especially true in SWA. It's a condition we must recognize and deal with in both Army materiel and doctrine.

The first step in solving this problem is to recognize a datum problem exits. You then can decide what datum to use as the basis for the common grid and shift (convert) all elements to that datum. WGS 84 is the standard global datum.

Common Grid Misalignment. The misalignment shown in Figure 2 is caused by the different datums. You must correct datum shifts before you consider other problems. As you can see in the figure, the howitzers are using one datum while the radar that supports them is using another datum. The targets generated by the radar won't correspond to the firing data for the guns. In this case, by shifting either the radar or target location to the Nahrwan datum, all will be on a common datum
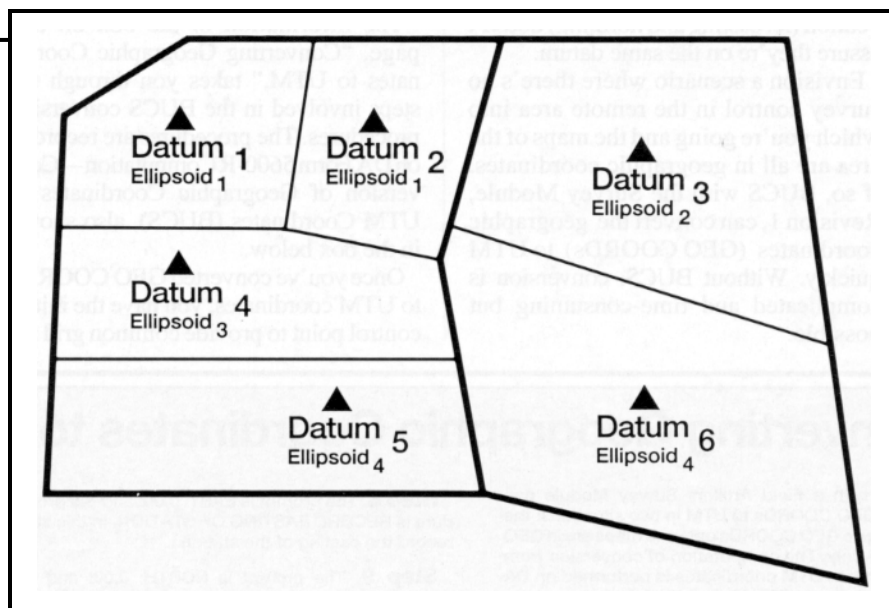
Figure 1: Multiple Ellipsoids and Datum. An area of coverage could look like this, especially in Third World countries. You decide which datum to use and convert all elements to that datum.
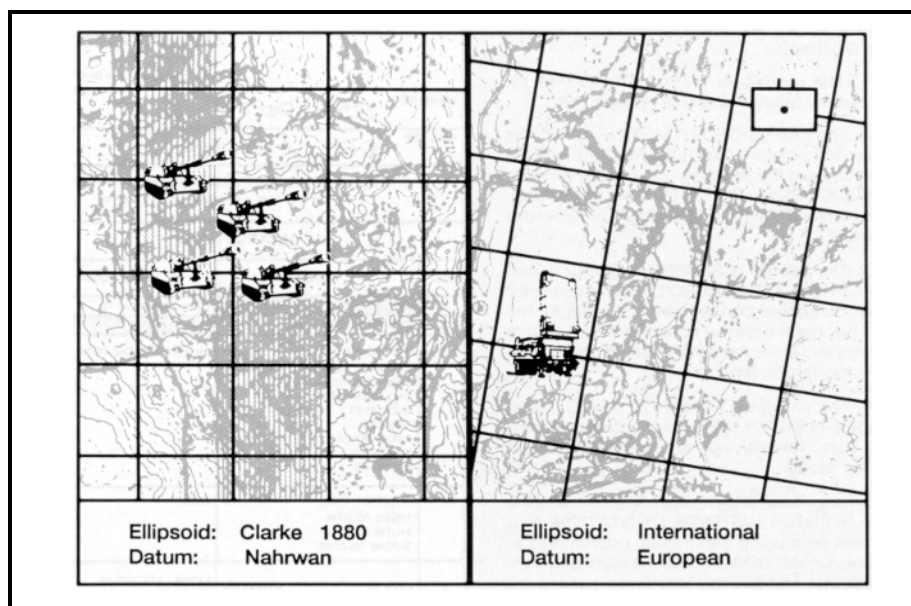
Figure 2: Common Grid Misalignment. Different datums cause this grid misalignment. The targets generated by the radar won't correspond to the firing data for the guns.

(grid).

In Figure 3, the issue appears to be even more complicated. The grid overlaying the Nahrwan and European datums shown in Figure 2 is the WGS 84 datum. The DMA and all services are moving toward this global datum system. But WGS 84 doesn't match any datum used before. In the not too distant future, all firing, targeting and planning elements must be able to shift to WGS 84 and operate using it.

At first glance, this may seem to be extra work. But if everyone shifts from a local datum to a common global datum for operations, then you'll achieve standardization.

Datum-to-Datum Transformation. Datum-to-datum conversion is a mathematical method of shifting one datum's origin and orientation to coincide with another's. The result is a common grid. The BUCS DDCT module with the help of *ST 6-2-40 BUCS Datum-to-Datum Coordinate Transformation* will perform the datum-to-datum transformation.

All conceivable source datums must be
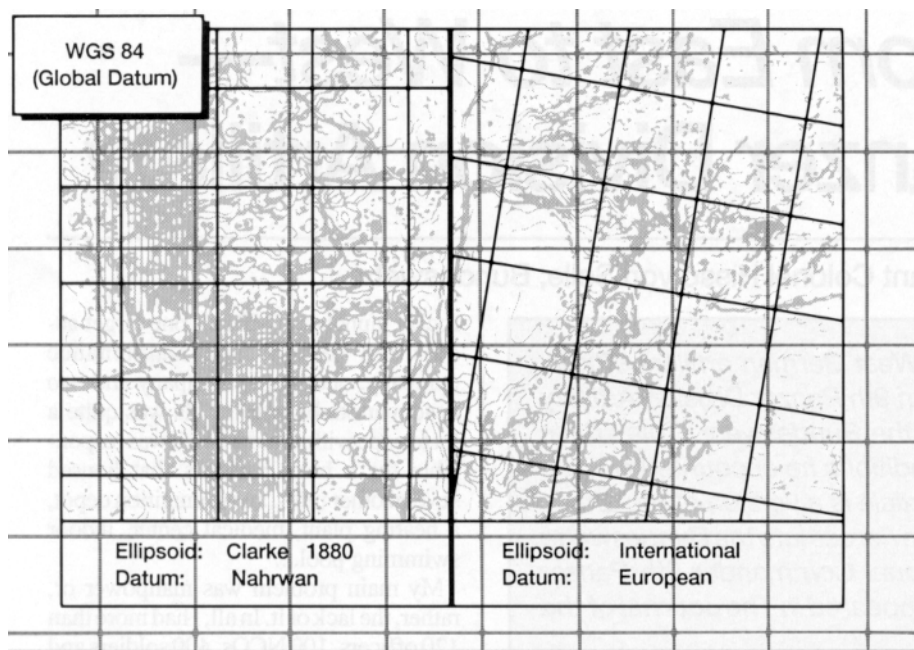
Figure 3: Global (GPS) Grid Misalignment. Overlaid on the map and grids in Figure 2 is WGS 84, the standard global datum. WGS 84 doesn't match any datum used before.

converted to one common datum for target acquisition and firing elements within a unified command. Source datums you must check include map spots, survey datums, GPS, digital targeting devices, target acquirers/locators and weapon systems.

All elements must be on one common datum either by performing the transformation with BUCS or, if BUCS isn't available, by applying the corrections mathematically when given the computed deviations from higher headquarters.

Here are some things you can do to prepare your unit to use common datum before you deploy:

• Be aware of possible datum problems and make your soldiers aware.

• Practice converting to a common datum on your equipment. Don't always use your post's current datum. Direct targets and positions be reported in a different datum (WGS 84).

• Understand that many of the datum parameters are still being defined and redefined. Through your chain of command, find out how you can request DMA parameters. Use the latest documentation and, where possible, use defined datums.

• Remember, your digital products may not be on the same datum as your maps and trig lists.

• Be aware DMA is producing new installation maps and much of your post data will not be the same when this happens—old trig lists and map data will need to shift to the new datum.

When you arrive on location and prepare for your mission, there are decisions to make about obtaining common grid. Some decisions you can make, but some are out of your hands and you just follow guidance.

Here are some things you can do to ensure you use common datum after you deploy:

• Follow the commander's guidance, if that guidance has already been given. If not, ask for guidance.

• Determine what type of coordinate system or systems you have and convert GEO COORDs to UTM, if necessary.

• If there's no survey control in the area, have the surveyors start a survey network.

• If survey control is available, determine what type of coordinate system it's based on and if the datums are compatible with available systems. Your commander's guidance will dictate which datum to use.

Here is a checklist for coordinate accuracy—some key items to consider when setting up and using common grid:

• Ensure you use the same datum to cover the entire mission from beginning to end.

• Know the source of your coordinates as well as their accuracy. Use coordinates for the purpose for which they were intended.

• Know the coordinate system you are using.

• Assess how current your coordinates are (current trig list).

• If multiple coordinates are available for the same point, select the best coordinates, based on the source and your intended use. Don't create new coordinates

by averaging all those available.

• Avoid mixing coordinates from different sources for the same purpose.

• Resolve differences between installation reference points or data base coordinates and desired weapon impact points.

• Evaluate the effect of any required coordinate/datum transformation. There are various automated and manual methods of converting coordinates; however, all methods are imprecise, and each introduces it's own errors into the converted coordinates.

• Match the accuracy of the coordinates with their required use: don't use map coordinates for a precision weapon or don't demand highly accurate coordinates for a briefing map.

When choosing which coordinates to use, you must consider several points. First, you must verify all coordinates when sources are in doubt. Then be sure the coordinates you're considering are the same datum as your operating system (e.g., aircraft inertial navigation system, weapon delivery system, etc.). Finally, be sure the coordinates are as accurate as your system requires.

Conclusion

This article has outlined some problems you could encounter on a deployment and some solutions. Use this information as a guide, and turn to your Field Artillery surveyor for assistance.

In the future, we'll fight battles on many fronts with many forces and allies. We must always be watchful to ensure we're all operating off a common grid and datum. If this isn't possible, we must ensure our forces are trained to adjust our data to provide the maneuver commander the accurate, timely fires he requires.

Staff Sergeant Dwight D. McKillip is a Senior Instructor and Writer in the Survey Branch, Target Acquisition Division of the Fire Support and Combined Arms Operations Department, Field Artillery School, Fort Sill, Oklahoma. He entered the Pennsylvania Army National Guard in 1975 and attended the Field Artillery Surveyors Course at Fort Sill, completing the course as an Honor Graduate. In 1977, he came on active duty and has served as a Rod and Tapeman, Instrument Operator, Computer and Chief of Survey for various units and as Chief Surveyor of the 1st Battalion, 18th Field Artillery, 17th Field Artillery Brigade in Germany.

Going from East to West—
The 9th Panzer Division Artillery

by Lieutenant Colonel Hisso von Selle, Bundeswehr

Lieutenant Colonel von Selle, a West German artillery officer, took command of the East German 9th Panzer Division Artillery in 1990 to transition the unit into the Bundeswehr. This article discusses his mission and the conditions he encountered while accomplishing the mission. The article is a version of the article "The Absorption of the East German Forces into the Bundeswehr: Six Month's Experience as Divisional Commander 9th Panzer Division" by the same author that appeared in **The Journal of the Royal Artillery**, *September 1992.*

At 0001 hours on 3 October 1990, the Defence Minister of the Federal Republic of Germany took command of all German Armed Forces, including those of former East Germany.

About six weeks before the unification of Germany, our minister of defense asked officers to volunteer for duty in East Germany. Their tasks would be either to take command of an East German (ex-National Volks Armee, or NVA) unit or serve as an advisor for an existing East German unit commander.

I asked to be considered for the job of division artillery commander in the Potsdam area. Though I was lucky enough to be selected for such an appointment, I wasn't sent to Potsdam as I had hoped, but rather to a place called Eggesin, which was 14 kilometers west of the Polish border on the north German coast (see the map). I was later to discover the area is very remote and the East German military regarded assignment in Eggesin as a *punishment* posting. I had one week's notice before having to report for duty at my new job.

The concept of taking over East German communist forces—officially called "integration of the forces"—had three parts. First, we were to replace all commanders of major formations from the brigade level up with officers from West Germany. Next, we were to replace commanders of medium-sized units (regiments and battalions) that were to be retained as part of the Bundeswehr. Third, we were to provide West German officer advisers to those ex-NVA units to be disbanded.

In my new capacity as division artillery

Germany

commander, I was responsible for five artillery battalions, each equipped with 18 howitzers (90 self-propelled guns—an artilleryman's *dream)*, one rocket battalion equipped with 18 RM-70 multiple rocket launchers (MRLs), one target acquisition battery, one maintenance company, one supply company and two headquarters batteries. This was quite a lot to cope with. In addition, I was responsible for a huge barracks that housed several other units, an ammunition depot, a heating plant, medical center, indoor swimming pool....

My main problem was manpower or, rather, the lack of it. In all, I had more than 120 officers, 100 NCOs, 400 soldiers and 100 civilians. My mission—to reorganize and transition the ex-NVA artillery organization into a Bundeswehr division artillery—could not be accomplished by myself. In addition to the ex-NVA manpower already mentioned, I had a team of West German officers: three lieutenant colonels, all of whom had already been artillery battalion commanders; one major; three captains; and one lieutenant. I also had two teams, each consisting of a captain and two warrant officers, that were responsible for basic training.

The first problem was how to allocate these West German officers to my units. I decided the only effective way was to restructure my command into one headquarters and service battalion and two artillery battalions. I allocated one lieutenant colonel and one captain as an advisory team to each battalion, which left me with a major and a lieutenant for my artillery headquarters.

On my second day in command, the restructuring resulted in my having to notify two of the battalion commanders they were no longer required for duty and were dismissed from service. I also had to dismiss my predecessor—a 40-year-old colonel—who, when greeting me in his East German uniform upon my arrival, had asked what my mission was. He was more than a little surprised to learn I was taking over his command the next morning. Nobody had

Main entrance into the barracks at Eggesin.

bothered to inform him of the change of command. He stayed around for the next two weeks, which from time to time was helpful but, as you can imagine, also became a little embarrassing at other times.

The most interesting question was how to get along with our ex-NVA counterparts? After all, they had been our enemies for 40 years. And what about their communist background? It had been a requirement that all officers and senior NCOs be active members of the communist party. Should we treat them as spies who just pretend to be loyal to the democratic system, or should we try to educate and convince them?

The way ahead was difficult, but in general, there were no real problems. I quickly found out that the true communist officers and political commissars had left the army before unification to avoid confrontation. Quite a lot of the officers—I believe the majority—had joined the army to be officers, not party members. My predecessor had persuaded the older officers and NCOs to leave the army before we came. When we arrived, there were only three remaining who were over 40 years old.

In October 1990, the NVA had about 100,000 soldiers: 25,000 officers, 25,000 NCOs and 50,000 conscripts. It was clear from the start that many would have to be dismissed. The plan was to offer two-year contracts to those regular officers and NCOs we wanted to keep in the Bundeswehr and then, during this period, ascertain whether or not we wanted them to remain any longer.

All ex-NVA officers under my command were under pressure because they knew a large number of them would have to leave the army within six months. Therefore, to stand a chance of getting a two-year contract with the Bundeswehr, they would have to behave impeccably.

By April 1991, we had 18,000 former East German soldiers still on active duty: 3,500 officers, 6,500 NCOs and 8,000 conscripts. These soldiers are being integrated into the German Army but continue to undergo extensive reviews of their records. We expect another 10 to 20 percent will be released from active duty because of political activities in the NVA.

The original Bundeswehr plan had three parts. First, we wanted to persuade a large number of the East German officers to leave within three months and receive a lump sum gratuity of between 5 to 7,000 DMs (deutsche marks), based on their rank and service. Second, we wanted to retain some officers for six months until most of the units to be disbanded had disbanded. Third, we wanted to retain a fewer number of officers for two years as cadre for those units that would remain as part of the Bundeswehr.

All this had to be accomplished by eight weeks after our arrival—a very difficult task indeed when you bear in mind I had to decide the fate of many families. Quite often I felt very sorry for these people, and this part of my job was the nastiest. We from the West wanted them to trust us and develop confidence in the democratic system, but at the same time, we kicked them out of the army and reduced the ranks of many who remained.

Effective 3 October 1991, all military personnel had to wear Bundeswehr fatigue uniforms. Almost all colonels, lieutenant colonels and majors were downgraded by one rank because they were far too young for their ranks in comparison to their Bundeswehr counterparts. Quite a lot of officers were downgraded a second time when they got their two-year contracts. Sometimes a lieutenant colonel and former battalion commander became a captain, while a full colonel and former division artillery commander became a major and deputy battalion commander of one of the newly formed battalions.

The handover/takeover ceremony of the 9th Panzer Division Artillery. On the left is the division commander (West German) shaking the hand of the author.

Quite apart from these measures to reduce manpower in the Armed Forces, it had been decided that all generals, political commissars and members of the Secret Police (Stasi) had to go. As it stood, most already had left the services before we got to Eggesin.

By the time we arrived, any remaining members of the Secret Police were well hidden. During my tour of duty, I discovered that a former major in the Secret Police was employed as a civilian driver in the regiment and that another officer was working in the garrison heating plant. Much more difficult to discover, however, were the Secret Police informers, and to be frank, I was unable to find any during my tour.

It occurred to us to look through personnel data files to identify some of the more active or fanatical communists. This turned out to be a false hope as we quickly discovered the officers and NCOs had been given their individual files before we arrived and had purged all damaging information from them.

Daily Military Life

How did it all work on a day-to-day basis? Of course, there were lots of problems and misunderstandings. To give but one example of what we had to cope with—the East German Army was notorious for its lack of all sorts of supplies, spare parts, furniture, cleaning materials, etc. This meant units kept everything that might come in handy one day—rusty and twisted nails, old brooms, etc. When we arrived, attics, cellars and storerooms were full of rubbish and scrap. It was a real mess that had to be disposed of. I gave instructions for all to be cleaned up within the next two weeks. But after one week, I realized nothing had happened and became determined to find out why.

The answer was quite simple. The East Germans didn't understand what we call "mission tactics." This is the method whereby a commander is given a mission, but it's left to him to decide the means of achieving it. In my example, no work had been carried out because the battalion commander had not received detailed instructions on *how* he should carry out his task—something that he was accustomed to receiving from his superiors. It was interesting, however, to see that quite a number of officers and NCOs learned quickly and got used to the new system very fast. Others never did.

The Qualifications of Officers and NCOs. East Germany ran its army with many more officers and fewer sergeants than we do. It isn't surprising, therefore, that quite a number of officers did sergeants' jobs. There was good reason for this. The East German Armed Forces had always had problems recruiting officers and NCOs. Therefore, to make a career in the military more attractive, many were promoted to officer rank, paid better wages than the average population and provided housing, while the rest of the people had problems finding any accommodations at all. The East German Armed Forces even provided better holiday resorts for their professional soldiers—not for the conscripts, I can assure you.

It isn't surprising that 50 percent of the officers were, in effect, only qualified to carry out jobs that in the Bundeswehr would normally be done by our sergeants—running kitchens and mess halls, petroleum supply points, etc. In a battery, you found only one gunnery sergeant, the Number 1 of the first gun (the other gun team leaders were corporals). In a Bundeswehr gun battery, we have eight sergeants. So, in their system, seven equivalent jobs were performed by officers.

The other 50 percent of the officers held assignments equivalent to our system—forward observer, battery commander, etc. Staff officers had comparable qualifications with our officers. They were trained and accustomed to a different system but quickly learned to adapt to Bundeswehr standards.

For example, I sent an East German major to a West German battalion for a four-week training period. When he returned, the West German battalion commander called me to ask if the major could come back to his unit for another four weeks because preparations were under way for a training exercise in Munster Lager and his own second-in-command was on leave.

Accommodations. I experienced my first shock when I realized I had to tell my predecessor I was replacing him. The second was when I saw my accommodations. I was in an all-ranks bachelors quarters. My room had a locker, a table, two chairs, a wash basin and two beds and was three-by-four meters large. There was no space left in the room to put my luggage and personal items.

The simple solution—I thought—was to remove one of the beds. On suggesting this to the captain who had showed me to my room, I was informed this was not possible
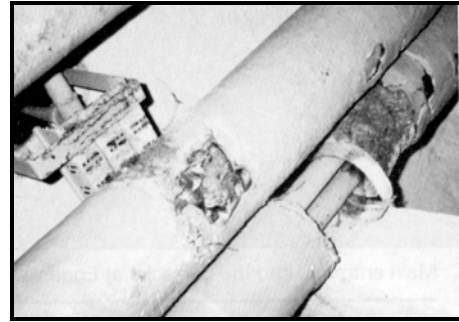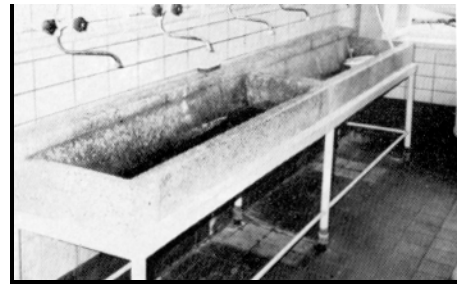
Top: East German soldiers' washroom. Middle: Rotten pipe insulation. Bottom: Broken pieces in the cellar floor where rats come in.

because the other bed was reserved for another Bundeswehr lieutenant colonel. Well, the other lieutenant colonel stayed in a hotel that night, but he had great difficulty in finding one.

The next day, I discovered there were lots of empty rooms in the quarters. The East German officers had been too lazy to have them cleaned and equipped...or could it have been their way of showing a modicum of opposition to our being there? I never found out, but it was quite common to have two senior officers living in one room.

The living standards for soldiers was even worse. They had to be content with extremely old furniture, filthy washrooms and toilets and no showers. There was a central shower building in the barracks, but it was closed for hygienic reasons and
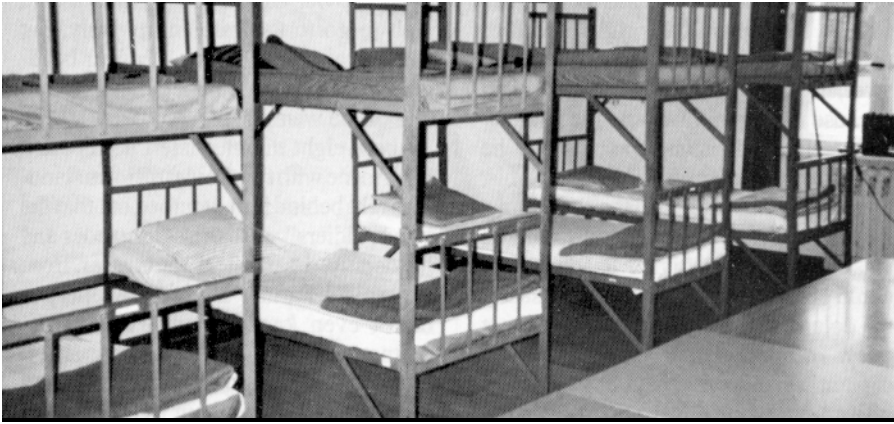
East German soldiers' room.

because the building was unsafe. But soldiers are inventive. They brought hand showers from home and fixed them to the taps in the washroom, which didn't help a lot. There were only 400 liters of warm water in the boiler for 200 soldiers living in the building—two liters of warm water per man.

Not to be deterred, the soldiers found another solution: "bowl-showering." This entailed pouring a bowl of water over your body followed by a soaping and then another bowl of water over your body. They even created a new German word for this process, *Abschusseln*. I had never heard this word and had to have it explained carefully before I understood what it meant.

Equipment. As I mentioned, I had 90 self-propelled guns. In fact, this consisted of 72 122-mm 2Sls of the latest design and 18 152-mm howitzers that were a bit older. In addition, I had 18 RM-70 MRLs. All the equipment was in immaculate condition. Sometimes I had the impression they took better care of their guns than their soldiers.

The mechanics were excellent, being both highly skilled and extremely well-motivated. But even they sometimes had to battle poor facilities. For example, the only vehicle ramp they had was falling apart.

However, because the German Army planned to destroy the majority of the guns and sell the rest (even though they were quite new and well-maintained), we had no further requirement for the ramp. We were going to destroy the guns because they didn't meet western safety standards, and we didn't want to expose our soldiers to asbestos and the toxic gases that invade the fighting compartment during firing. And with the Conventional Arms Reduction Treaty,

we needed to eliminate a lot of guns anyway.

By November 1992, Germany was in the process of destroying the majority of the NVA's equipment and had sold some to such countries as Finland and Turkey. For example, Finland bought 2S1, D-20 and D-30 howitzers and T-72 tanks to replace its older systems.

In the 9th Division Artillery, I found a lot of evidence to support the belief that combat readiness took priority over all else in the East German Army. For example, when I took command, I discovered that combat vehicles had their allocations of small-arms ammunition on board—about 1.5 million rounds in all. Also, more than 100 tons of artillery shells were on trucks in the barracks, something unbelievable in the Bundeswehr. In addition to these stocks, the division artillery's ammunition depot was full to overflowing. Having the ammunition on board certainly would make it much easier to meet the East

German Army's requirement for the entire regiment and all its equipment to reach an assembly area within 40 minutes of being notified to move. I'm convinced they enforced these requirements, not only because of the loaded ammunition, but also because before "The Wall" came down, 85 percent of the soldiers had to be in their barracks at all times.

It took a lot of time to find all the different places where ammunition was stored and then relocate it to a safe place. I'm sure we found all the Kalashnikovs and Makarovs rounds, but there's no telling if we got all the small-arms ammunition.

Guarding all the equipment was difficult. This was exacerbated by the fact that some of the conscripts on guard duty had had only four weeks of very poor military training. Making guard duty even more difficult, wild boars dug in the middle of the barracks at night.

The Kitchen and Mess Hall Building. By the end of my first week, I had seen most of my new domain and decided to take a closer look at the building that housed the kitchen and mess hall. I had already eaten there during the first few days in command and had seen the girls and soldiers who worked in the kitchen. Outwardly, they appeared to be competing among themselves to see who could wear the dirtiest clothes. I later learned there wasn't enough money for laundering, but there was certainly some laziness involved too.

The East German Army used to have five different places to eat: two dining halls for conscripts and regulars (corporal

An East German 122-mm self-propelled howitzer in excellent condition.

to captain), a dining room for staff officers, another for battalion commanders and their guests and one for the *Leitung*. The *Leitung* is the division artillery commander, his five deputies and members of the Secret Police. And *this* is what they called the classless society.

I rapidly learned the kitchen equipment was old and about half the machines and cookers didn't work—neither did the two lifts for moving food from the cellar. Quite apart from the state of repair, everything needed a thorough cleaning.

Then I inspected the cellar. As I went downstairs, I was greeted with a very nasty smell. This, I discovered, was from a pile of cardboard boxes, glasses and empty tins—literally hundreds of them—that had been emptied in recent weeks. It appears the recycling system had collapsed, and they didn't know where to put all the items. They hadn't dared to just get rid of them.

The next room was for food storage. Immediately, I saw large holes in paper sacks filled with noodles and rat droppings all around. It was quite clear what caused the holes in the sacks. When I asked the lieutenant responsible for the kitchen what he was going to do with the "rats' noodles," he replied he would use up the noodles in the sacks with holes first. "To make sure the rats get some *fresh* noodles from the unbroken sacks?" I asked. But my ironic question was lost on a man who seemed to know no better. We then found some other food that was date expired. I immediately gave orders to destroy all food that was date expired or had broken packaging.

At that point, a captain said to me, "I forbid you to destroy that food." You can *imagine* how surprised I was to hear that. I asked the captain what right he had to forbid my orders. Before he could answer, my East German S4 explained that because the captain was the food supply officer from division headquarters, he was allowed to say such things. This, apparently, was normal in the communist system. Even a lieutenant, providing he was from the next higher headquarters, could give orders to colonels, and usually the colonels obeyed. I, however, did not obey. In no uncertain terms, I told the captain what to do. My East German officers were sure this would result in my military career ending rather abruptly. During the rest of the tour of the cellar, I looked at rotten pipe insulation, dripping ceilings and broken places in the floor that gave the rats easy access to the cellar.

"Our Friends." About three weeks after I arrived, we were having our usual Monday morning staff briefing when my secretary came in to tell me two Soviet soldiers were at the gate and wanted to see me. Earlier we had discussed the problem of what to do if Soviet soldiers came asking for asylum. An East German major had the "brilliant" idea of just taking them back to the Soviet barracks. When I told him this might mean the death penalty for deserters, he answered that if we didn't return them, Soviet officers would come and take them forcibly. The major was a bit confused when I told him I would never allow armed Soviet soldiers in our barracks to take back deserters and, if necessary, would issue orders to keep them out by force.

I then told one of my East German majors who had spent four years training in the Soviet Union and spoke Russian well to go to the gate and politely, but firmly, take them to the division headquarters. "Jawohl, Colonel," he answered and off he went.

About eight minutes later, he reported back to me with two Soviet officers standing right behind him. It turned out that the two "soldiers" were the commander and his deputy, the political commissar, from my Soviet Partner Division Artillery. I didn't even *know* I had a Red Army partner. I clearly remember my shock lasted for some seconds. Recovering my composure, I asked them to have coffee with the major while I finished the staff briefing. We then resumed our meeting, and I asked my officers the one question uppermost in my mind: What kind of partnership had been established with our Soviet neighbors?

I was told about joint exercises and live-firing, sports competitions and social meetings, but the staff also emphasized that no real friendships or private gatherings had resulted from the partnership. They explained that when The Wall had come down a year ago, the Russians had cut off all established contacts and relationships. However, it appeared my predecessor had tried to keep the spirit of the partnership alive.

It seemed strange that the Soviets were trying to re-establish contact now after Germany was unified and the East German Armed Forces dissolved. I sent for another Russian-speaking officer, a captain, who had recently returned from a four-year course at the Leningrad Military Academy, and then asked my new "partners" to come in.

The senior Russian turned out to be a full colonel. We started off by discussing our careers, which strangely enough turned out to be rather similar. Then he came to the reasons for his visit.

He asked if we would like to take part in some joint training and live firing. I was slightly taken aback at this suggestion. Our manuals and doctrine give no clue as to what to do in such a situation. However, because we had other activities planned for the immediate future, I told him we weren't going to conduct artillery training and that, in any case, we intended to destroy most of the Soviet-made guns because of their asbestos content and toxic fumes. He appeared to have difficulty in understanding the latter.

He went on to ask about sports competitions. On the surface, this seemed like a

Soviet-made 152-mm howitzers, part of the 9th Panzer Division Artillery.
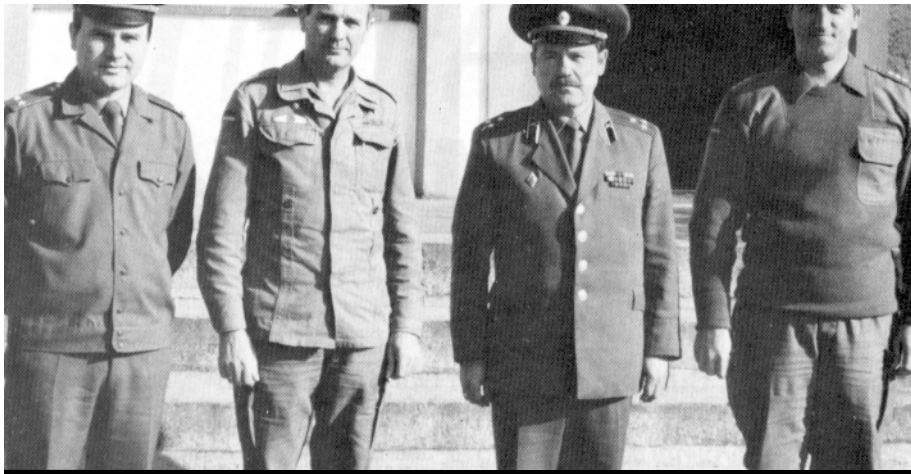
"Our Friends." From left to right: The Soviet Political Commissar, the author, Colonel Bachtin (Soviet Division Artillery Commander) and Captain Kube (ex-NVA S4, who was the author's interpreter).

good idea, but we had no decent sports field and just a small gymnasium. I suggested we wait until spring before pursuing it.

He then invited us to visit him in two weeks to celebrate "Artillery Day." I accepted this invitation but was surprised when he wanted only West German officers to attend. Naturally, I insisted I come with an equal number of West and East German officers; we had to show our solidarity as one army, but I also needed some Russians linguists to accompany me.

The political commissar, a lieutenant colonel, asked if we celebrated any special days in the Bundeswehr because they wanted to send us congratulatory messages. It was blatantly obvious they were angling for invitations. I felt sorry when I had to tell them we didn't celebrate "Forces Day," an "Army Day" or an "Artillery Day" but promised to invite them in January anyway.

Quick as a flash, my "clever" captain interpreter mentioned Saint Barbara's Day, the patron saint of artillerymen, whose feast day is celebrated on December 4th each year. The communist army neither recognized nor celebrated saints' days, and we had just started organizing our first Saint Barbara's Day celebration. I tried to change the subject quickly, but it was too late. Both Russians obviously understood some German and immediately wanted to know more about Saint Barbara's Day and how it was celebrated. I tried to explain the tale of Saint Barbara but discovered there were some interpretation problems. Up to this point, my two East German officers interpreting hadn't had a problem, but they now tried to interpret totally new

vocabulary words—religious words, such as faith, prayer, etc. The Russian colonel eventually agreed it wasn't a good idea to join a celebration being held for the first time in East Germany, especially one that was foreign to his upbringing and beliefs.

The colonel had another point to make. If the Bundeswehr was going to destroy most of the Soviet-made guns and rocket launchers, why not give my spare parts to him? He said that getting such supplies from the Soviet Union was very difficult, and he had to keep his guns and vehicles combat ready. I wasn't prepared for this question either, but I managed to tell him the Bundeswehr was not there to improve the combat readiness of the Red Army. On the contrary, I said, we wanted them to leave Germany as soon as possible. He understood my point of view immediately.

He then went on to explain that his soldiers had to clean up all the environmental mess in their training areas (which, in effect, meant they covered them with sand), and he asked for tents, space heaters and boots. He explained his soldiers would be in the training areas from Monday to Saturday and had no tents, no shelter, no huts—not even usable boots. My interpreter captain translated all this but added that I should agree to the tents and space heaters, but not the boots. So I did. When our visitors left, I asked him why we shouldn't give them boots as well. He explained that none of the Soviet soldiers would ever see the boots because the officers would sell them. It seems that corruption in the Soviet Army is a normal part of life.

There's much more to tell about my "new friends," but I'll restrict myself to

relating the occasion we visited them for the first time. The party took place in a canteen-like room, and of course, we had vodka (made in the USA) and German beer to drink. We left at about 2300 hours after having become quite sentimental with our Soviet hosts. The farewells took some time, and in the end, I was kissed by the political training officer—fortunately on my cheek, but unfortunately he wasn't well-shaven.

Conclusion

My six-month tour at the Polish border was the most exciting, challenging and busiest time I've ever had. I'm frequently asked, "What was NATO afraid of? Did our intelligence services fail totally?"

It's difficult to answer such questions. I can only say that we must remember certain things about the East German Army. We took over an organization that had been run down for much longer than the 11 months since the Berlin Wall had come down. The "run down" had actually started two years earlier when 50 percent of the armed forces had begun working in factories, mines and farms. Before this time, the East German Army was well-trained and combat ready.

My predecessor had informed me that if his regiment had been ordered to Berlin in October or November of 1989, his soldiers would have shot at demonstrators without any qualms. I would have agreed with him if he had been talking about the early 1980s. I doubted it very much when he was talking about 1989.

Lieutenant Colonel Hisso von Selle, Bundeswehr of the Federal Republic of Germany, commanded the 9th Panzer Division Artillery of Eggesin, Germany, for six months in 1990 and early 1991. Currently, he commands *Artillerieregiment* 12 (12th Artillery Regiment) and has served as Deputy Commander of the *Artillerielehrregiment 5*. He also has commanded an 8-inch battery, an M109 battalion and a target acquisition battalion. Among Lieutenant Colonel von Selle's other assignments, he served two tours as an Instructor in the German Artillery School and one tour as the German Army Liaison to the British Royal School of Artillery. He entered service with the Bundeswehr in April 1960.

Targeting—
Making it Work

by Lieutenant Colonel David C. Cutler and Captain Gary J. Kotouch

The 82d Airborne Division, Fort Bragg, North Carolina, field standing operating procedures (FSOP) defines targeting as "the process of identifying enemy targets for possible engagement and determining the appropriate attack system to be used to capture, destroy, degrade or neutralize the target in question." At the division level, all battlefield operating systems (BOSs) are included in the targeting effort. The targeting techniques used in the 82d Airborne Division's recent Warfighter exercise were developed from the Field Artillery School's targeting course and, more importantly, from professional exchanges in articles such as this. The 4th Infantry Division (Mechanized) Artillery article, "Targeting, Keeping it Simple," by Colonel John A. Gloriod and Lieutenant Colonel Scott E. Nahrwold (February 1992) was particularly helpful.

The Targeting Challenge

The challenge we faced in targeting during our Warfighter exercise was to bring to bear the full lethality of our fire support systems before the opposing force (OPFOR) could bring his to bear. Lieutenant General Wilson A. Shoffner's diagram, "the Sphincter Chart" (Figure 1), depicts the problem we faced during an incremental series of command post exercises leading up to the division's Warfighter. In each exercise, the enemy brought his fire support assets to bear earlier and in larger quantities than we did. Over time we were able to wear him down with superior weapons and logistics, but a war of attrition like we faced in those exercises is costly in terms of soldiers lives—a cost we must minimize.

General Shoffner's model provides some useful insights with respect to the counterfire fight. Gaining superiority requires us to reduce the "delta" or difference depicted in the model between our fire support and that of the enemy. This can be accomplished by "stealing a march" on the enemy, slowing the rate at which he

can bring his systems to the battle and accelerating the rate at which our systems join the battle.

We can steal a march by seizing the initiative, in effect, sliding the friendly line in the diagram to the left. This might take the tactical shape of a preemptive deep attack against enemy fire support systems. Slowing the enemy's fire support would be shown as a reduction in the slope of the enemy's line in the diagram, turning it to the horizontal. Attacking the enemy's system of systems, his target acquisition or logistics, in addition to his guns, is a good example.

Finally, accelerating the rate at which our systems are brought to bear reduces the delta by increasing the slope of the friendly line—tilting it more to the vertical. In a tactical sense, this can be accomplished by causing our fire support systems to function at maximum efficiency, exploiting all systems available to the commander. That is what this article is about.

The Process

To synchronize our targeting process, we modified the decide-detect-deliver (D^3)
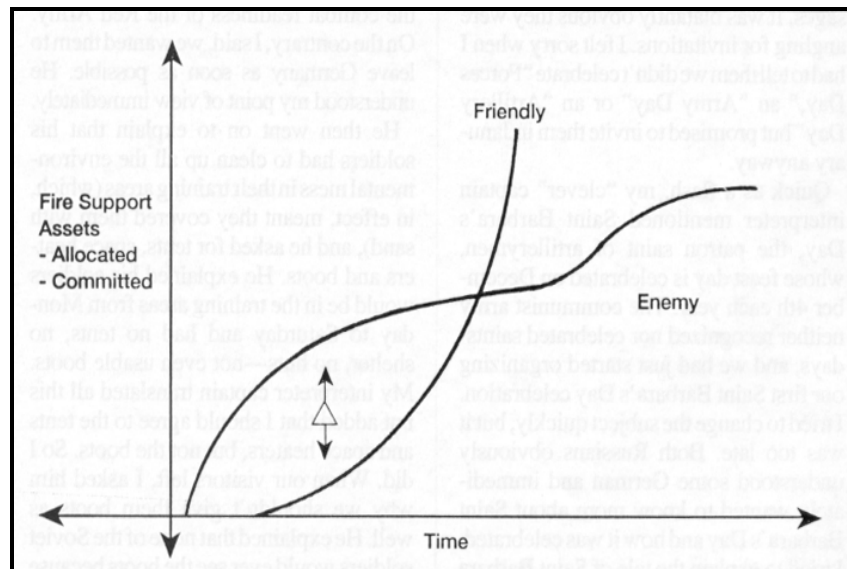

Figure 1: The Sphincter Chart. The problem is to bring the full lethality of fire support systems to bear before the OPFOR can bring his to bear.

methodology to D^3A (decide-detect-deliver-assess), placing greater emphasis on the "assess" function. This methodology evolved from the division commander's criteria for starting certain phases of operations that depended on the success of fire support. With the exception of pilot in-flight reports (INFLTRPTs), none of our attack systems had a mechanism to measure their success. Resources with which to detect and assess are especially limited in light divisions. So we prioritized and allocated our resources using the same staff that had assigned missions to the delivery assets.
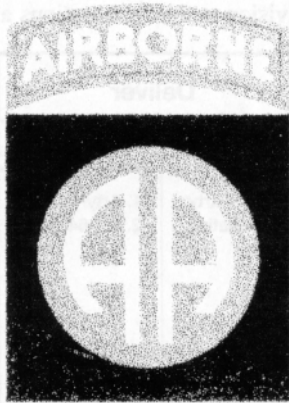
The vehicle that facilitated this synchronization was the division targeting board. During the preparation of plans and orders, the battlefield management cell (BMC) conducted targeting concurrently with the planning process. The BMC, chaired by the Assistant G3 (Plans) officer, was composed of representatives from all the BOSs. During wargaming and synchronization, the BMC developed initial plans for synchronizing fire support assets, both lethal and non-lethal, and using intelligence collection assets. This BMC targeting was facilitated by the division deputy fire support coordinator (DFSCOORD). Before presenting a final plan or order to the commanding general for approval, a formal targeting board met to finalize synchronization plans and ensure they were within the capabilities of the division to execute.

The targeting board developed three primary products that were included in both the fire support and intelligence annexes of plans and orders: the high-payoff target list (HPTL), the targeting synchronization matrix (TSM) and the delivery standards matrix (DSM).

The targeting board considered the battlefield for targeting from two perspectives. The current battle considered the battle with the enemy's committed and uncommitted forces the division would face in the next 24 hours—deep, close and rear. The future battle was the battle the division anticipated fighting in the next 48 to 72 hours against, as yet, uncommitted enemy forces. Targeting for the future battle primarily produced the division's air interdiction (AI) nominations.

The format used for the HPTL was consistent with that presented by the Field Artillery School's targeting course. The modification we made was to divide the list in two and list the current and future HPTs separately (Figure 2).

Two targeting synchronization matrices were developed, one using each of the two HPTLs (Figure 3, Page 36). The TSM listed the high-payoff targets in order of priority. The targeting board then assigned responsibilities to agencies and units to detect, deliver against and assess those targets. As responsibilities were fixed, the asset envisioned to be used was also indicated. This provided the board a check to ensure all assets were used and that assets or agencies were not overtaxed. The matrix had the force of an order by itself but received additional emphasis in the division plan or order with specific instructions, where appropriate.

The DSM (Figure 4, Page 37) provided criteria for the attack of HPTs in the current battle and also facilitated objective decision making for attacking these targets at the lowest possible level. The Field Artillery intelligence officer (FAIO) in the division G2 Intelligence Production Section (IPS), the target analyst in the division FSE and the fire direction officer (FDO) in the Div Arty tactical operations center (TOC) all referred to the matrix. HPTs identified were automatically engaged if they met the criteria established by the matrix. The matrix provided instructions for each of the HPTs in the current battle concerning the accuracy of the target location, the size of the target, whether it was moving or stationary and the time of acquisition.

During the execution phase of operations, the division targeting board met twice daily at 0900 and 2100. The times selected for these meetings were driven by requirements of both the division and corps. These times were subject to change, depending on which numbered Air Force was in support. The division targeting cycle (Figure 5, Page 38) depicts recurring events in the targeting process. The 0900 targeting board focused on the current battle, and the 2100 targeting board focused on the division's future battle. Additionally, the 0900 targeting board provided the division aviation brigade with an update on the targets to be attacked

Priority	Category	Target
Current (<24 Hours)		
1	Fire Support	M46, Astros/BM-21/FROGS, 2S5, D-20, D-30, Attack Helicopters
2	Air Defense Artillery (ADA)	MR II SA-6/8/13
3	Reconnaissance, Surveillance and Target Acquisition (RSTA)	ARK-1, Observation Posts, Patrols
4	Maneuver	3-47 Armor, 15 Mech Brigade, 3 Recon Battalion, 14 Mech Brigade, 2 Motorized Battalion
5	Logistics	Ammunition Cashes and Convoys
Future (48-72 Hours) Airborne/Air Assault		
1	ADA	MR III SA-6/8/13
2	Fire Support	Astros, 2S1, 2S3
3	Maneuver	Contingency Defense Force, 11 Mech, 11 Armor Brigades

Figure 2: High-Payoff Target List. The 82d Airborne Division Artillery modified the HPTL to separate current and future HPTs.

during the division deep attack that evening. The 2100 targeting board approved the AI nominations that were then verified and passed to XVIII Airborne Corps not later than 0600 the next morning.

The division chief of staff chaired the targeting boards, and the DFSCOORD served as facilitator. Exact attendance was situationally dependent, but all of the BOSs and responsible agencies were represented by officers empowered with decision-making authority (Figure 6, Page 39).

The targeting board met in the chief of staff's briefing tent at the division main command post. Conduct of the meeting was disciplined and adhered to a fixed agenda (Figure 7, Page 39). The content of briefings during the operation were generally by exception with members prepared to address their areas of concern if questions arose. Changes to the agenda

Decide			**Detect**		**Deliver**		**Assess**	
P	Category	HPTs	Agency	Asset	Agency	Asset	Agency	Asset
1	Fire Support	M46 Astros/BM-21/FROG 2S5	Div Arty	Firefinder	1. Div Arty 2. Aviation	1. Arty/MLRS 2. AH-64	Aviation	INFLTREPs
			G2	EAD Assets: COMINT, IMINT, RF-4C, UAV, SYRUS, TENCAP			G2	Analysis
			313 MI	Quickfix TRO-32			313 MI	Quickfix
		D-20, D-30	Div Arty	Firefinder	Div Arty	Arty/MLRS		
		Attack Helicopters	3-4 ADA	Organic, National	3-4 ADA Div Arty	Organic Arty, MLRS	3-4 ADA	Organic
2	ADA	MR II SA-6/8/13, S16, ZSU-23	G2	TENCAP, EAD ELINT, IPB	Div Arty	SEAD Arty, MLRS	G2	TENCAP, EAD ELINT
					G3/EWO	EF-111, F4G		
3	RSTA	ARK-1	USAF		Div Arty	Arty/MLRS	USAF	INFLTREPs
			G2	EAD ELINT			G2	EAD ELINT
		OPs, Patrols	Brigades	Organic	Brigades	Organic	Brigades	Organic
4	Maneuver	3-47 AR, 15 Mech Bde, 3 Recon Bn, 14 Mech Bde, 2 Mtzd Bn	1-17 Cav	Organic	G3/EWO (313)	Quickfix TLQ-17	313 MI	Jamming Eff Reports
			G2	LRS, Joint STARS, SLAR	Div Arty	Arty, MLRS	G2	LRS, 1-17 Cav, 2 Bde Spotreps
			2 Bde	Organic				
			313 MI	Quickfix TRO-32	Aviation	AH-64	Aviation	Pi-Reps
5	Logistics	Ammunition Caches and Convoys	G2	SLAR, Joint STARS, IMINT	Div Arty	Arty, MLRS	USAF	INFLTREPs
					FSE	AI Nom		

Legend:		
P = Priority	**MI** = Military Intelligence	**Joint STARS** = Joint Surveillance and Target Attack Radar System
OPs = Observation Posts	**EAD** = Echelon Above Division	
AR = Armor	**COMINT** = Communications intelligence	**EWO** = Electronic Warfare Officer
Mech = Mechanized	**IMINT** = Image Intelligence	**FSE** = Fire Support Element
Bde = Brigade	**UAV** = Unmanned Aerial Vehicle	**MLRS** = Multiple-Launch Rocket System
Recon = Reconnaissance	**TENCAP** = Tactical Exploitation of National Capabilities	**SEAD** = Suppression of Enemy Air Defenses
Bn = Battalion	**ELINT** = Electronic Intelligence	**AI Nom** = Air Interdiction Nominations
Mtzd = Motorized	**IPB** = Intelligence Preparation of the Battlefield	**INFLTREPs** = In-Flight Reports
Div Arty = Division Artillery	**LRS** = Long-Range Surveillance	**Eff** = Effects
Cav = Cavalry	**SLAR** = Side-Looking Airborne Radar	**Pi-Reps** = Pilot Reports

Figure 3: Targeting Synchronization Matrix. Two TSMs are developed, one for current HPTs (as shown) and one for future HPTs. The "Assess" block is a tool for measuring success, specifically the success of fire support critical to starting particular phases of an operation.

that may have been required were resolved before the meeting and the agenda appropriately modified. The agenda for a typical meeting was:

G2 Intelligence Production Section. A representative from the G2 IPS reviewed the enemy situation, battle damage assessments (BDAs) and high-value targets. At the 2100 board, the assessment included an estimate of the enemy's most probable courses of action during the next 24, 48 and 72 hours.

G3. A representative from the G3 section reviewed the current friendly situation. The 2100 board included a projection of where we would be in the next 24, 48 and 72 hours.

Category	HPTs	Target Location Error			Size of Unit			Stationary/Move			Time (of Last Verification)		
		Arty DS/R/GS/GSR	CAS/AI	Atk Helos	Arty DS/R/GS/GSR	CAS/AI	Atk Helos	Arty DS/R/GS/GSR	CAS/AI	Atk Helos	Arty DS/R/GS/GSR	CAS/AI	Atk Helos
RSTA	OPs	100 m - 200 m	200 m	500 m	Sec	Sec	Sec	Stat	Stat	Stat	72 Hrs	72 Hrs	48 Hrs
	Patrols	100 m - 200 m	200 m	1 km	Sec	Sec	Sec	Stat	Stat	Stat/Move	2 Hrs	1 Hr	1 Hr
	ARK-1, AZK-5	100 m - 200 m	200 m	1 km	Sec	Sec	Sec	Stat	Stat	Stat/Move	12 Hrs	6 Hrs	6 Hrs
ADA	SA-6/8/13	100 m - 200 m	200 m		Sec	Sec		Stat	Stat		2 Hrs	1 Hr	
	S60	100 m - 200 m	200 m		Sec	Sec		Stat	Stat		2 Hrs	1 Hr	
	ZSU-23-4, ZU-23-2	100 m - 200 m	200 m		Sec	Sec		Stat	Stat		2 Hrs	1 Hr	
Fire Support (Deep)	Astros, FROG	100 m - 200 m	200 m	1 km	Btry	Bn	Bn	Stat	Stat	Stat/Move	1 Hr	2 Hrs	2 Hrs
	BM-21	100 m - 200 m	200 m	1 km	Btry	Bn	Bn	Stat	Stat	Stat/Move	1 Hr	2 Hrs	2 Hrs
	2S5, M46	100 m - 200 m	200 m	1 km	Btry	Bn	Bn	Stat	Stat	Stat/Move	1 Hr	2 Hrs	2 Hrs
Maneuver	T-62	100 m - 200 m	500 m	1 km	Plt	Co	Bn	Stat	Stat/Move	Stat/Move	15 Min	30 Min	90 Min
	BRDM, BMP	100 m - 200 m	500 m	1 km	Plt	Bn	Bn	Stat	Stat/Move	Stat/Move	15 Min	30 Min	90 Min
	BTR-60	100 m - 200 m	500 m	1 km	Plt	Bn	Bn	Stat	Stat/Move	Stat/Move	15 Min	30 Min	90 Min
Fire Support (Close)	2S1, 2S3	100 m - 200 m	500 m	1 km	Btry	Bn	Bn	Stat	Stat	Stat/Move	15 Min	30 Min	90 Min
	D-30, D-20	100 m - 200 m	500 m	1 km	Btry	Bn	Bn	Stat	Stat	Stat/Move	15 Min	30 Min	90 Min
Logistics	Ammo Caches	100 m - 200 m	500 m	1 km	Co	Co	Co	Stat	Stat	Stat	72 Hrs	72 Hrs	72 Hrs
	Resupply Convoys	100 m - 200 m	500 m	1 km	Co	Bn	Co	Stat/Move	Stat/Move	Stat/Move	30 Min	30 Min	30 Min

Legend:

DS = Direct Support **GSR** = General Support Reinforcing **Atk Helos** = Attack Helicopters **Plt** = Platoon

R = Reinforcing **CAS** = Close Air Support **Sec** = Section **Co** = Company

GS = General Support **AI** = Air Interdiction **Btry** = Battery **Bn** = Battalion

Figure 4: Delivery Standards Matrix. The DSM provides criteria for attacking HPTs in the current battle and facilitates objective decision making for attacking these targets at the lowest possible level.
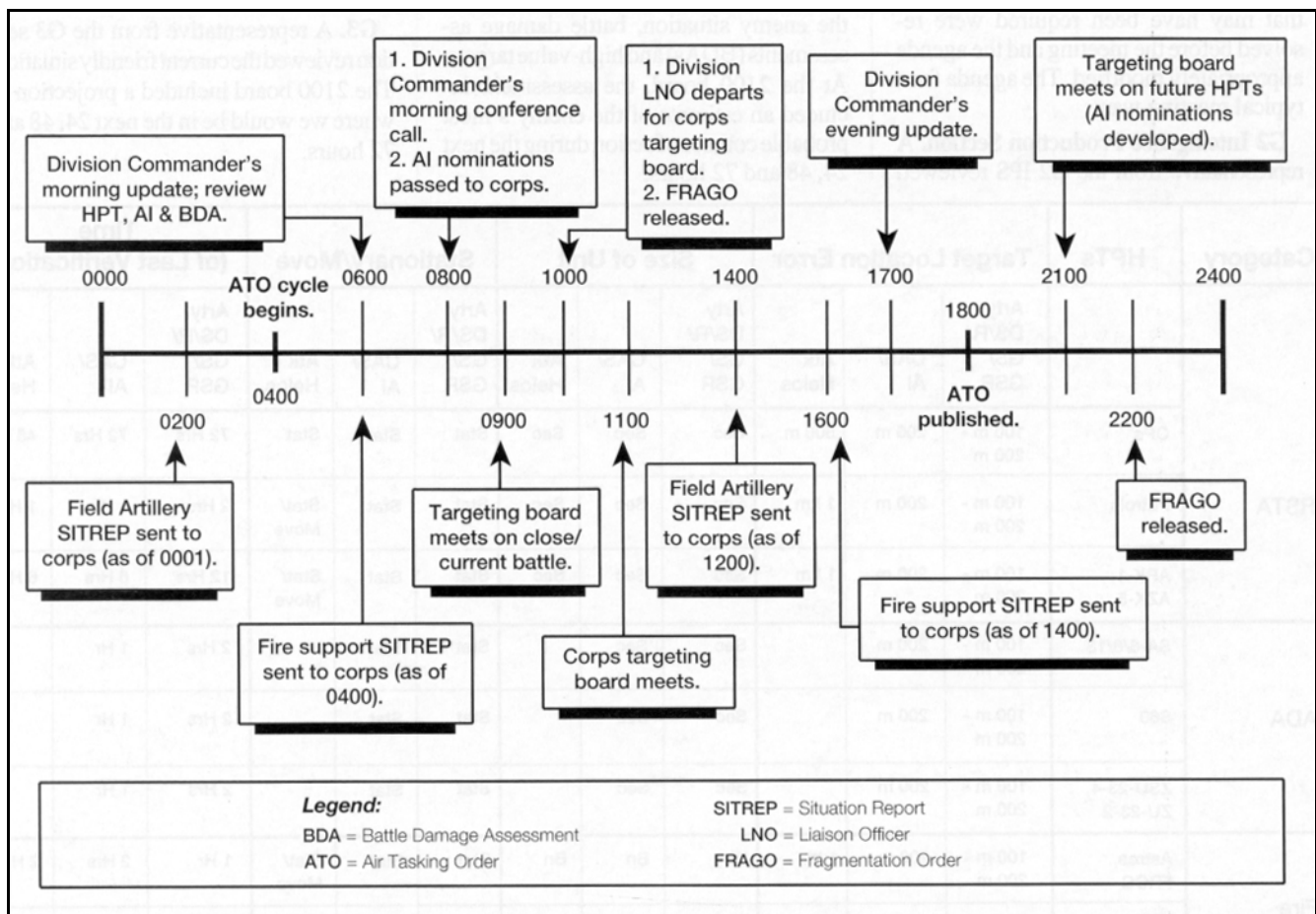
Figure 5: This 82d Airborne Division targeting cycle depicts recurring events in the targeting process.

Fire Support Element (FSE). The DFSCOORD reviewed the current corps targeting priorities and the division HPTLs. The 0900 targeting board considered primarily the current HPTL, and the 2100 board considered primarily the future HPTL. Changes were made as required based on the G2's and G3's reviews of enemy and friendly situations.

G2 Collection Management and Dissemination (CM&D). The CM&D officer reviewed the intelligence collection assets available to both the corps and division and the priorities assigned to those assets controlled at echelons above division. The DFSCOORD briefed the status and priorities for Field Artillery collection assets, such as Firefinder radars, as appropriate.

It was important for us to consider the coverage provided by corps and echelons above corps (EAC) assets. We modified times assigned to division collection assets to complement those of corps and EAC to ensure adequate coverage for the targets and times critical to the division.

All. The board reviewed delivery assets available. The electronic warfare officer (EWO) discussed non-lethal assets, the DFSCOORD discussed Field Artillery assets, the aviation brigade attack helicopter assets and the Air Force air liaison officer (ALO) air-delivered assets. The assistant division engineer (ADE) discussed planned obstacles that required inclusion into target planning.

FSE. The FSE provided a review of fire support coordinating measures (FSCMs). This ensured that FSCMs were placed to facilitate fires and proper clearance was obtained before delivering those fires. The staff judge advocate and G5 were present and prepared to brief or recommend changes to the rules of engagement (ROE) as they pertained to planned targeting efforts.

FSE. The FSE reviewed the targeting synchronization matrix. This product was the most important part of the board's efforts. The TSM was a working document prepared ahead of time and facilitated by the FSE. The board approved the matrix as

presented or revised it, based upon modifications to priorities or assets available. When major changes to the division plan occurred, the matrix was completely rewritten during the meeting, based on input from board members.

Upon completion, the matrix was provided to division agencies and subordinate units as part of the next fragmentary order (FRAGO) with the most significant elements also contained in the FRAGO as specified instructions. At the 0900 board, agencies with responsibilities fixed by the TSM back-briefed their respective responsibilities to the chief of staff. This ensured that responsibilities were understood and provided an additional means to measure BDA.

FSE. The DFSCOORD briefed corps target nominations only at the 2100 targeting board. The G2 targeting cell, which consisted of the FAIOs and G2 IPS officers, prepared a color-coded overlay to accompany the daily lists of AI nominations furnished to corps. This constituted a back-brief to the board that ensured all

- Division Chief of Staff
- FSCOORD (Div Arty Commander)
- Aviation Brigade Commander
- MI Battalion Commander
- G2
- G2 Division Tactical Operations Center Support Element (DTOCSE)
- G2 Operations
- G2 Intelligence Production Section (IPS)
- G2 Collection, Management and Dissemination (CM&D)
- Field Artillery Intelligence Officer (FAIO)
- G3 Plans
- G3 Operations
- Army Airspace Command and Control (A^2C^2) Cell
- ADA Officer
- DFSCOORD
- Air Liaison Officer (ALO)
- Air-Naval Gunfire Liaison Officer (ANGLICO)
- EWO
- Battlefield Deception Officer
- Chemical Officer
- Assistant Division Engineer (ADE)
- G5
- Psychological Operations (PSYOPS)
- Staff Judge Advocate (SJA)

Figure 6: Members of the Targeting Board. The division chief of staff chairs the targeting board meetings, and the DFSCOORD serves as facilitator. Attendance of the various board members at the meetings is situationally dependent.

G2	Enemy Situation/BDA/High-Value Targets
G3	Current Friendly Situation
FSE	Current/Proposed HPTL
CM&D	Collection Assets Available/Taskings Required (Organic & EAD)
All	Assets Available (By Exception/As Required)
FSE	Fire Support Coordinating Measures
FSE	Targeting Synchronization Matrix
FSE	Corps Target Nominations
FSE	Summarize/Recap
G3/FRAGO	Actions Required as a Result of Meeting

Figure 7: Targeting Board Meeting Order of Briefing. The board meetings adhere to a fixed agenda.

nominations met the targeting criteria established by the targeting board. AI nominations and the HPTLs were constantly monitored and updated. Corps SOPs required verification of target nominations 24, 12 and four hours before delivery of fires.

FSE. The DFSCOORD summarized the agenda discussed for the chief of staff and ensured that decisions were obtained where required. The targeting board was a decision-making body, and accountability was maintained for those decisions.

G3. A FRAGO backbrief was conducted. Targeting was a division effort, not just an initiative by the fire supporters. The G3 was responsible for disseminating modifications to the plan made by the targeting board to subordinate units. The mechanism used was a FRAGO to the current order. The G3 operations officer back-briefed those elements that were to be included in the FRAGO for approval. The FRAGO was released within a few hours of the targeting board's adjourning.

Targeting for Contingency Operations

The same methodology used for Warfighter and current operations is also used for contingency targeting. The 82d Airborne Division, like other divisions, is concerned with a number of contingency plans. HVTs and HPTLs are developed for those plans that are country-specific and for which adequate intelligence is readily available. While a troop list in a contingency plan should not be considered complete until the plan is executed, it provides a rudimentary listing of collection and delivery assets that may be available. The BMC also drafts the targeting synchronization matrix.

When alert scenarios provide time for planning, targeting is done concurrently. The targeting board is convened and decisions are obtained from the chief of staff. The greatest challenge posed to the targeting effort is in a constrained notification-hour (N-Hour) sequence when the requirement exists for the first 82d Airborne Division units to depart Pope Air Force Base, North Carolina, 18 hours following notification.

In the 18-hour sequence, the first orders are issued to the alerted force two hours after alert notification (N+2). As much information as possible is provided at the N+2 briefing, at a minimum, the HPTL and fire support assets available. The BMC, less those officers involved in the N+2 briefing, convenes during the N+2 briefing to complete the targeting board products. Following the N+2 briefing, at N+3:30, the targeting board convenes with the chief of staff and other key members to obtain approval. It is critical that this be done expeditiously to facilitate the alerted units' planning and the coordination of pre-assault fires. The targeting products must be provided to the airborne command and control platform and the agencies responsible for providing preassault fires for a forced-entry operation, most likely Air Force or Navy assets.

Conclusion

The D^3A methodology is valid and works. Our Warfighter provided an excellent opportunity to stress the planning and decision-making processes in the 82d Airborne Division and exercise the synchronization of the BOSs and all parts of the fire support system. Feedback in the "assess" part of the process was critical to targeting board and command group decisions. It was not a fire support effort that made targeting successful, it was a combined effort that involved primarily the G2 for intelligence and assessment and the G3 to synchronize all the BOSs.

In the 82d Airborne Division, targeting is an integral part of both plans and operations. The evolution of the procedure, meeting agenda and products are a result of lessons learned by other divisions and our own experiences in preparing for Warfighter.

There are other valid applications for contingency forces. The 82d Airborne Division routinely incorporates targeting into emergency deployment readiness exercises (EDREs), scheduled off-post

training and major exercises and external evaluations. We have conducted targeting and used the process to coordinate pre-assault fires for a brigade parachute assault into and a subsequent rotation at the Joint Readiness Training Center (JRTC), Fort Chaffee, Arkansas.

The targeting process and products are used easily at both the brigade and division levels. They have undergone the tests of both Warfighter and the OPFOR at the JRTC. The 82d Airborne Division has confidence in the proven process and depends upon it in plans and operations to synchronize the BOSs and enhance the lethality of the division.

Lieutenant Colonel David C. Cutler has been the 82d Airborne Division Deputy Fire Support Coordinator, Fort Bragg, North Carolina, since July 1992. His previous fire support and targeting experience includes Brigade S3 in the 214th Field Artillery Brigade, Fort Sill, Oklahoma; Brigade FSO in the 1st Armored Division, Germany; and Fire Support Team Chief, also in the 82d Airborne Division. Lieutenant Colonel Cutler is a graduate of the Command and General Staff College, Fort Leavenworth, Kansas, and holds a Master of Arts in International Affairs from the Catholic University of America.

Captain Gary J. Kotouch has been the Field Artillery Intelligence and Targeting Officer at the 82d Airborne Division since September 1991. His other experience includes serving as an Armor Company Fire Support Officer, Battery Fire Direction Officer and Firing Battery Platoon Leader for three years in the 3d Infantry Division (Mechanized), Germany. After attending the Infantry Officer Advanced Course at Fort Benning, Georgia, he attended the Targeting Course at Fort Sill and the Joint Firepower Control Course at the Air Ground Operations School, Hurlburt Field, Florida. He's a graduate of Auburn University, Alabama.

NOTES FROM UNITS

Increasing the Strategic Airlift for Airborne Artillery

On 6 and 7 August 1992, the Department of the Army Test and Experimentation Command, Airborne and Special Operations Test Directorate (TEXCOM, ASOT-D) evaluated a low-velocity airdrop (LVAD) of two howitzers on one platform (2-HOOP) at the Fort Bragg, North Carolina, Sicily drop zone. The new 2-HOOP procedure proved successful and enables the 82d Airborne Division Artillery (Div Arty), Fort Bragg, to load two 105-mm howitzers and 82 boxes of ammunition on one 20-foot, Type V platform. It increases the task force commander's firepower without increasing the number of airlift aircraft, reduces the time required for airborne cannoneers to locate and de-rig howitzer heavy equipment loads and delivers one-third more ammunition to the airhead.

The concept for this procedure originated with the 82d Div Arty. With a limited number of aircraft available to the task force commander during emergency deployment readiness exercises (EDREs), the Div Arty saw the need to increase the commander's supporting artillery without increasing the airlift requirements. Through a joint initiative with the ASOTD, the Div Arty began transforming an idea to meet a need into a viable procedure. The solution, 2-HOOP, evolved from a variation of the British airdrop system. The new procedure places the howitzers at an angle with one tube higher than and crossed with the other. All the materials
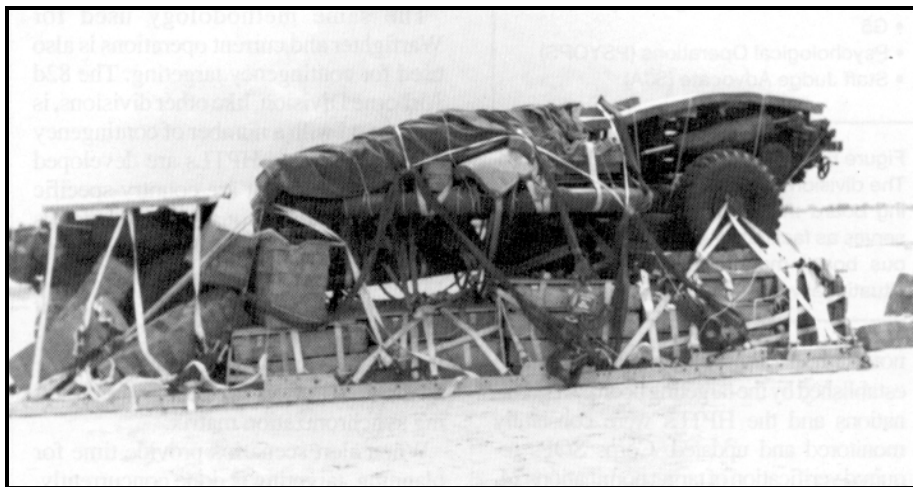
The 82d Airborne Div Arty 2-HOOP LVAD. Two 105-mm howitzers are rigged on one 20-foot Type V platform with 82 boxes of ammunition for a low-velocity airdrop. The howitzers are placed at an angle with one tube higher than and crossed with the other.

needed for this configuration are "off the shelf."

This project highlights the productive relationship between the field and the test directorates that has been extremely beneficial to the 82d Airborne Division and the XVIII Airborne Corps, also at Fort Bragg. Other projects being evaluated include placing 81-mm mortars on both the 16- and 20-foot howitzer platforms, tandem rigging the M119A1 howitzer and M1037 high-mobility multipurpose wheeled vehicle (HMMWV) prime mover on a 32-foot platform, rigging the M1038 (section ammunition vehicle) with 45 boxes of ammunition and rigging 63 boxes of 105-mm ammunition on the 12-foot resupply platform.

The 2-HOOP LVAD procedure was approved in November 1992, and the Div Arty has been using it in training since December—an amazing one-year span from a good concept to an operational reality.

SFC Phillip C. Lemon, Master Gunner
82d Airborne Div Arty, Fort Bragg, NC

MLRS Reduced-Range Practice Rocket (RRPR) Fielding in October

Effective training and practice provide for a strong probability of success in most endeavors. But the lethality of multiple-launch rocket system (MLRS) tactical rockets preclude their use on our training ranges.

The M28 practice rocket emulates the tactical rocket and has been used by MLRS units for more than 10 years. The confidence and proficiency derived from training with these practice rockets was demonstrated when MLRS soldiers successfully executed missions during Operation Desert Storm. The M28 practice rocket, however, has a restrictive surface danger area that limits the areas from which MLRS units can conduct live-fire training. That's soon to change.

The Field Artillery community requested a training round that would grant access to more firing ranges and still provide the launch-point realism that enhances training and validates launcher reliability. The dilemma was that no funds were available to initiate a formal development program for a new practice rocket.

In a true spirit of cooperation among the MLRS Project Office, Fort Sill, Oklahoma; the MLRS contractor Loral-Vought Systems Corporation (LVSC), Dallas, Texas; and the US Army Missile Command (MICOM), Redstone Arsenal, Alabama, a value engineering change proposal was signed in March 1992 to incorporate the M28A1 reduced-range practice rocket. (A value engineering change is a contractor-initiated idea that saves the government money.) In early October 1992, two sets of three RRPRs each were fired successfully at White Sands Missile Range, New Mexico. The firing program (30 rockets) was completed in March 1993.

The rocket has a blunt nose that, upon impacting with the ground, detonates a smoke cartridge. The smoke is readily visible beyond three kilometers, so observers at training ranges can report the safe impact of the rockets.

The high ballistic drag of the blunt nose coupled with software changes keep the impact of the RRPR between eight and 15 kilometers (Figure 1). The ground impact versus an air burst keeps the surface danger area manageable. MLRS units will be able to use training ranges previously available only for cannon artillery.

As an example, the 7th Army Training Center at Grafenwoehr, Germany, currently has only one firing point from which MLRS units can conduct live-fire missions. With the RRPR, five additional firing points will be available. This addition will provide the unit commander the ability to train as he will fight (Figure 2). The commander can now disperse his launchers tactically and mass fires from multiple firing points. The RRPR uses the same pod as the tactical rockets, so soldiers also maintain their skills in storing, transporting, loading and unloading MLRS ammunition.

RRPR uses the same rocket motor used by the MLRS tactical rockets, and the total rocket weight is the same. The software provides the identical software prompts the soldier sees when he fires a tactical rocket (except for the indication that an M28A1 is loaded in the launcher instead of a tactical rocket). The soldier in the launcher and soldiers in the surrounding area experience the same firing sensations they would receive if firing a tactical rocket.

Commanders should be aware, however, there's no accuracy requirement for the RRPR. The only requirement is that the rocket always "hit" the impact area. Once the rocket has left the launcher, it has completed 99.99 percent of its required functions.

After analyzing the test results, cutting the rockets into the production line and materiel being accepted by the government, the first deliveries of RRPRs are projected to start in October.

Lieutenant Colonel Robert F. Arnone, FA
Assistant Project Manager, MLRS
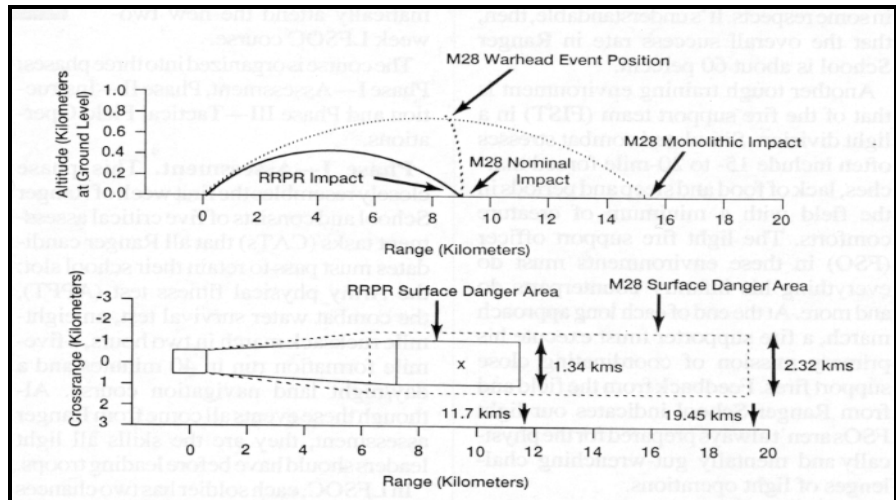*Redstone Arsenal, AL*

Figure 1: Comparison of RRPR Trajectory (Top) and Surface Danger Area (Bottom) at a Nine-Kilometer Range
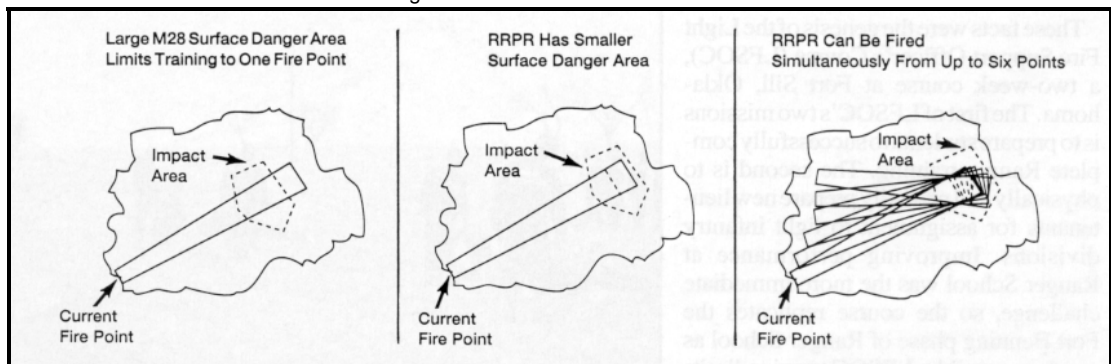

Figure 2: Firing Range Benefit of RRPR. Using Grafenwoehr Training Area in Germany as an example, units will be able to fire the RRPR from five additional firing points.

At the Cutting Edge of Battle—
The Light Fire Support Officer's Course

by Lieutenant Colonel Thomas G. Waller, Jr. and
Captain David W. Riggins

Ask any graduate of the Ranger Course at Fort Benning, Georgia, who's also a combat veteran, and he'll tell you the environment of Ranger School is as close to combat as it gets in peacetime. Many would say it's eventougher in some respects. It's understandable, then, that the overall success rate in Ranger School is about 60 percent.

Another tough training environment is that of the fire support team (FIST) in a light division. Simulated combat stresses often include 15- to 20-mile forced marches, lack of food and sleep and periods in the field with a minimum of creature comforts. The light fire support officer (FSO) in these environments must do everything his infantry counterparts do and more. At the end of each long approach march, a fire supporter must execute his primary mission of coordinating close support fires. Feedback from the field and from Ranger School indicates our light FSOs aren't always prepared for the physically and mentally gut-wrenching challenges of light operations.

Light Fire Support Officer's Course

These facts were the genesis of the Light Fire Support Officer's Course (LFSOC), a two-week course at Fort Sill, Oklahoma. The first of LFSOC's two missions is to prepare students to successfully complete Ranger training. The second is to physically and mentally prepare new lieutenants for assignment to light infantry divisions. Improving performance at Ranger School was the more immediate challenge, so the course replicates the Fort Benning phase of Ranger School as much as possible. LFSOC training limits the amount of food and sleep students get while requiring them to perform to the highest standards.

Graduates of the Field Artillery Officer Advanced Course going to Ranger School or graduates of the Field Artillery Officer Basic Course going to either Ranger School or a light unit automatically attend the new two-week LFSOC course.

The course is organized into three phases: Phase I—Assessment, Phase II—Instruction and Phase III—Tactical Field Operations.

Phase I—Assessment. This phase closely resembles the first week of Ranger School and consists of five critical assessment tasks (CATs) that all Ranger candidates must pass to retain their school slot: the Army physical fitness test (APFT), the combat water survival test, an eight-mile rucksack march in two hours, a five-mile formation run in 40 minutes and a day/night land navigation course. Although these events all come from Ranger assessment, they are the skills all light leaders should have before leading troops.

In LFSOC, each soldier has two chances to successfully perform the five events.
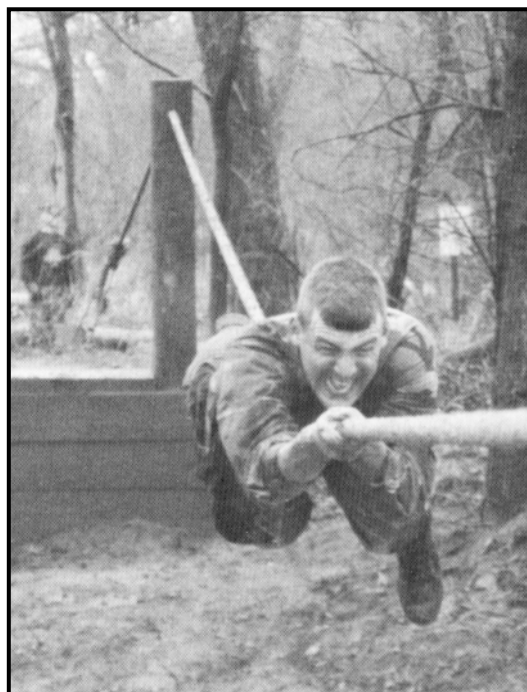
Additionally, the course has a day and night practice land navigation course as a refresher before the graded test. These training events, along with an obstacle course, give the student a challenging snapshot of some of the rigors that await them at Fort Benning or their light units. During Phase I, the ration cycle is A-MRE-MRE, and the students get about four hours of sleep a night.

Phase II—Instruction. The second phase of LFSOC begins on day four with training on weapons common to a light infantry unit, such as the M60 machinegun and M18A1 claymore mine. Students also learn how to tie 10 mountaineering knots.

Next, there's instruction on small-unit movement formations and techniques, including negotiating danger areas and

LFSOC Phase I. This phase closely resembles the first week of Ranger School and is physically and mentally demanding.

reacting to enemy contact. Once the students understand the basics of movement, they're ready to learn how to conduct a point reconnaissance and a squad ambush. Classroom instruction is reinforced by the "walk-through" technique with cadre members explaining placement considerations of men and weapons, based on mission, enemy, terrain, troops and time available (METT-T).

In the next two days, students receive detailed instruction on planning and issuing a warning order and squad patrol order, using the same formats taught in the first phase of Ranger School. For most of these officers, this is the most detailed instruction on the operations order (OPORD) they've received. The final day of Phase II instruction is devoted to special fire support assets available to light units, to include naval gunfire, AC-130 aircraft for close air support (CAS) and Army aviation. Half the day is instruction in the classroom and the other half is application of these new skills in the training set fire observation (TSFO) facility.

Phase III—Tactical Field Operations. The final phase of LFSOC involves putting together all the skills learned during Phases I and II. It begins with a one-day cadre-led patrol where instructors walk students through each phase of an actual field operation from planning to

LFSOC Phase III. The final phase of the course pulls together all the skills learned in Phases I and II and tests them in tactical field operations.

debriefing after the mission. After "crawling" during Phase II and "walking" the previous day, the students are ready to "run."

The next day, students plan and execute an air assault operation deep into enemy territory in a low-intensity conflict environment. They conduct reconnaissance and ambush patrols in search of drug cartel mercenaries working for the diabolical "Tony Montana." The hostile territory is actually Camp Eagle, on the western edge of Fort Sill, and the enemy mercenaries are infantry soldiers from Task Force 2d Battalion, 2d Field Artillery (previously known as friendly forces of the Field Artillery School at Fort Sill).

During field training, soldiers receive two MREs per day and sleep (when they can) in a patrol base "under the stars." Two cadre instructors accompany each squad with a primary mission of ensuring safety and providing timely feedback on how well the students are performing. Cadre members lead after-action reviews (AARs) after each phase of the mission, emphasizing leadership, tactics and fire support. The tactical training lasts four days and gives students a taste of the challenges associated with light field operations.

During the final 24 hours of the course, students provide feedback in the form of written critiques. The LFSOC cadre uses this feedback to "fine tune" the course. The cadre also encourages graduates to provide additional feedback after they've arrived at their units and (or) Ranger School. Several have written with information on how the course helped prepare them and how it can better prepare future graduates. One graduate wrote that after one week in the 82d Airborne Division, Fort Bragg, North Carolina, an 18-mile road march with his supported infantry battalion was "no problem." Another graduate wrote from Ranger School to say he felt he owed his "Go" on a graded patrol to the experience he gained from LFSOC. In addition, the success rate of Field Artillery officers at Ranger School has already improved by 20 percent after only three LFSOC iterations. Letters like these, along with the improved performance of Redleg Ranger candidates, leads us to believe we have a good thing going in LFSOC. As we train more Ranger-bound officers, we expect our success rate to improve even more.

We're also striving to improve and refine our instruction aimed at light fire supporters. Currently, we're working with the Fire Support and Combined Arms Operations Department (FSCAOD), part of the Field Artillery School, to get new

and better lesson plans for topics such as naval gunfire, CAS, AC-130 and laser terminal guidance and target marking. We hope to create scenarios where new Field Artillery lightfighters have to plan fires in support of airborne or air assault operations and noncombatant evacuation operations (NEO) or humanitarian relief operations, to include writing fire support annexes and execution matrices. Of course, we'll monitor changes at the Ranger School so we can provide the best preparation possible for Redleg Rangers.

Conclusion

In the post-Cold War era, our Army must be prepared for contingency operations anywhere in the world. In our most probable scenarios, light forces play a major role. FSOs for Ranger and light units must be prepared for unique challenges in exceptionally tough training and combat environments.

The LFSOC at Fort Sill equips its graduates to meet these challenges and lead the way to quick, decisive victory.

Lieutenant Colonel Thomas G. Waller, Jr.

commands the 3d Battalion, 30th Field Artillery Regiment (Provisional), Fort Sill, Oklahoma, the battalion that created and sponsors the Light Fire Support Officer's Course. In his previous assignment, he commanded the 3d Battalion, 32d Field Artillery (Lance) in Germany. Lieutenant Colonel Waller was the Assistant Fire Support Coordinator (AFSCOORD) in the Tactical Command Post of VII Corps during Operations Desert Shield and Storm. His light experience is as the AFSCOORD for the 82d Airborne Division, Fort Bragg, North Carolina, and S3 and Executive Officer of the 2d Battalion, 319th Field Artillery and Division Artillery Assistant S3, all in the 82d Airborne Division. He's a graduate of the Airborne and Ranger schools at Fort Benning, Georgia and the Jumpmaster school at Fort Bragg, North Carolina.

Captain David W. Riggins is the Commandant of the Light Fire Support Officer's Course and the S3 of the 3d Battalion, 30th Field Artillery Regiment (Provisional). He has served as the Assistant S3 of the 3d Battalion, 319th Field Artillery, 82d Airborne Division and also as a Battery Executive Officer, Reconnaissance and Survey Officer and Company Fire Support Officer while assigned to the battalion. Captain Riggins is a graduate of the Field Artillery Officer Advanced Course, Fort Sill and the Airborne, Ranger and Jumpmaster schools.

Lightfighter Series

Artillery TTPs for the
Danger-Close Fight:

Preventing Fratricide in the LID

by Captain David D. Hollands, USAR

This article is the last of Captain Hollands' three-part series on artillery tactics, techniques and procedures (TTPs) for the light infantry division (LID). The first two articles covered TTPs for the LID in the movement-to-objective and initial contact in February's edition and the LID in the attack in April's.

The lessons of Operation Desert Storm have placed fratricide prevention at the forefront of current tactical considerations. No where is this concern greater than among light forces where combat generally occurs in the realm of danger-close fires and troops have nothing more than battle dress uniforms (BDUs) and a Kevlar helmet for protection.

Fear of fratricide often paralyzes commanders into abandoning fire support in all but the safest situations. Company commanders (and even inexperienced fire supporters) often treat danger close (600 meters) as the minimum safe distance for indirect fires. This type of thinking effectively eliminates engaging any enemy firing small arms as the engagements invariably will occur at ranges less than 500 meters. Lightfighters must adopt the mindset that danger-close fires are the norm at the company level and train accordingly.

Executing minimum safe distance (MSD) fires is an inherently risky activity. The friction of war usually ensures the circumstances existing when you need danger-close fires in combat are far less than perfect. Therefore, commanders and

their fire support officers (FSOs) or forward observers (FOs) must analyze the risks before executing a mission. Considerations include the weapon systems available, proficiency of the firing unit, certainty of the target location, certainty of the friendly location and urgency of the tactical situation.

The accuracy of weapon systems decreases with the size of the weapon as does the lethal range of their munitions. Weighing first-round accuracy against the blast effects of a round is a delicate balancing act.

Commanders and fires support teams (FISTs) should assess the reliability of firing units before crossing the line of departure (LD). An unfamiliar artillery battalion or a mortar platoon attached from another unit (which happened to me during Operation Just Cause) may cause concern until it establishes its proficiency.

Preventing enemy and friendly location problems depend on sound map-reading skills and constant awareness of the surrounding terrain. There's no substitute for an alert FO who knows his location and the spot where he most expects the enemy to appear. These elements are critical to determining whether or not to fire and how

close to bring the initial rounds.

Tactical urgency is assessing the need for fires. It includes the likely effect of not using fires and establishes the acceptable level of risk for the situation. The pressures of tactical urgency are also the greatest hindrance to assessing the factors clearly and coming to an appropriate decision.

While sounding ponderous, this assessment must take place in a few seconds or minutes, depending on the intensity of the situation. This process also competes for the commander's attention with all other tactical considerations. During training, FIST chiefs and FOs must force their commanders and platoon leaders to make these decisions under conditions approximating those of combat. Only through constant, realistic drill will this process become routine.

The following techniques are those FOs and FIST headquarters can use to reduce risks to friendly troops during danger-close fire missions. Whether in Central America or at a Combat Training Center (CTC), mastering these techniques will greatly expand your commander's options.

Converged Sheaf. Specifying converged sheaf during the distribution portion of the method of engagement will reduce the size of the battery's pattern on the ground. The standard battery computer system (BCS) sheaf assumes a circular target with a 100-meter radius. The BCS then selects aim points for maximum coverage of the target. A converged sheaf places all rounds on a single point. This reduces the spread of the rounds and, therefore, allows greater confidence the rounds called in as danger close won't land on friendlies. The mortar ballistic computer uses a linear sheaf as a default solution. Directing mortars to fire a converged sheaf will have the same effect as it does on artillery. This technique is simple to direct. It isn't time-intensive, requires no coordination and only slightly degrades the effectiveness of fires (if the target is small or dug in, it may enhance effectiveness). It provides real safety margins for friendly troops. Units can establish converged sheaf as a fire order standard for all danger-close missions.

Fuze Delay. Using the delay setting on point detonating (PD quick) fuzes greatly reduces the effectiveness of the shrapnel pattern and radius for high-explosive (HE) munitions under some conditions. When firing into prepared defenses, forested areas or soft ground, the reduced radius

allows you to fire closer to friendly troops and still provide shock and suppressive effects on the enemy.

This technique is simple to execute (request "Fuze Delay" during method of engagement), isn't time-intensive, requires no coordination and provides real safety margins for friendly troops. Units can establish fuze delay as a fire order standard for all danger-close missions.

The drawbacks of this technique are reduction in munitions effectiveness and the possibility of ricochets. When firing a high charge at a small angle of impact on a hard surface, ricochets are possible. The .05-second delay will result in low

A mortar platoon sets up for operations in Desert Shield. Specifying mortars use a converged sheaf reduces the size of the platoon's pattern on the ground.

Marines fire an M198 howitzer. A non-lethal munition substituted for HE can greatly assure delivery of accurate danger-close fires.

airbursts. The gun-target line's relationship to friendlies becomes critical when evaluating the risk of ricochets.

Non-Lethal Munitions. A non-lethal munition substituted for HE can greatly assure a unit's ability to deliver accurate fires at a given point. Under circumstances where locations are in question or if a unit is erratic in its firing, this substitution avoids exposing friendly troops to friendly fires. But FISTs should not routinely use non-lethal munitions as the first round in a mission. Proper training should mitigate the need under most circumstances.

HC. Shell HC (smoke) is ballistically similar to HE and, except for possible square-weight differences, is fired using the same data as HE for a given point. After observing an HC round landing at the appropriate spot, the correction "Shell HE, Repeat" is fired using the same data, ensuring minimal fire direction center (FDC) and gun delay. The HC round is visible, even using night-vision goggles (NVGs), provides a significantly safer alternative to HE and a faster and more reliable spotting than any other non-lethal round.

Airbursts. Using an illumination round as the first round fired during a danger-close mission is also effective. This technique works best when the friendly location is uncertain or firing units are erratic or untested and when HE fires aren't needed immediately. Working with the FDC, you select a height of burst (HOB) appropriate for the terrain and vegetation. In open terrain, a 100-meter HOB will indicate where HE fires will land and minimize any distortion from wind.

Another option is using a white phosphorous (WP) airburst. You select the

HOB that gives the best visibility while avoiding unwanted target obscuration. A HOB of 300 meters should minimize ground smoke and still clearly indicate where the next volley of HE will land. This is a good alternative to illumination at night if you fear lighting up friendlies. WP will "white out" NVGs for about four seconds, so consider that factor. If special munitions are unavailable, an HE round with a 200- to 300-meter HOB also provides a safety check before firing for effect.

These techniques require some coordination with the firing unit and may catch units off guard if they haven't practiced them during training. The techniques guarantee no safety margin for troops but provide safe "check rounds" before firing HE. The drawbacks include warning the enemy early without any suppressive effects and causing a delay in lethal-munition support. Also, using munitions not ballistically similar to HE requires recomputation of data and shifting guns when HE is fired. This reduces the assurance that the first rounds will impact safely.

Conclusion. Using these techniques alone or in combination can provide increased safety margins under a variety of situations. They can increase confidence in the use of danger-close fires and keep the specter of fratricide from casting its shadow over future operations.

Failing to master these skills will either cause danger-close fires to disappear from light infantry operations or expose soldiers to needless risk. The infantry troops we support expect these skills from us, and as fire supporters, we must demand them from our FIST soldiers.

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Tactically Employing Today's SLGR

The small lightweight global positioning system (GPS) receiver (SLGR) was first introduced in mass during Operations Desert Shield and Storm. Our first reaction—it's the answer to all our dreams. No longer do we have to chase down chow, worry about a convoy getting lost or depend solely on one individual's navigational skills for overall mission success. Those deployed were introduced to the world of high-tech.

In Desert Storm, lack of significant terrain features didn't allow us to verify or compare the accuracy of the system to our maps. Some believed we didn't need to verify or compare because the system told us how close we were to the grid location. We were satisfied with it telling us we were within +10 or -10 meters. Besides, the maps and the terrain made it difficult for us to dispute the system accuracy, even if we wanted too.

Today, the situation has changed. The Department of Defense (DoD) has implemented selective availability (SA), a security measure that, among other things, denies unauthorized users access to satellites' precise positioning service. Because the SLGR systems are available commercially to civilians as well as other militaries internationally, SA was implemented. Therefore, the best accuracy we can expect from the SLGR under ideal conditions is within 100 meters of the actual location at least 95 percent of the time. This new accuracy imposes significant restrictions on users. We must re-evaluate how we tactically employ this piece of equipment.

The SLGR, as it stands, is an excellent tool for infantry, armor and other units that only require position accuracy to +100 or -100 meters. The SLGR also can be a very useful tool for the fire support officer (FSO). He can use it for location information for engineer obstacles, final-protective-fires (FPFs) and self-location. But he *does not* want to use the SLGR for positioning weapons systems—it doesn't meet the specifications for positioning artillery weapons.

The SLGR originally was intended as a navigational tool and still does this very well. However, we must be aware of some of its limitations and restrictions (discussed later in this article). First, let's look at a typical situation units may encounter when using the SLGR as a navigational tool.

Navigation

A battery commander (BC) is given a new area of operation. As he prepares for reconnaissance of the area, he makes all the usual checks and obtains all the situation information he can. He has just received new maps and has a SLGR, so he isn't worried about any navigation or positioning problems. He used a SLGR during Desert Storm, and it worked very well.

The road network in the new area is rather extensive, and the maps seem to be relatively correct, so he isn't paying close attention to the GPS. As he nears the position, where he planned to leave the road and move cross-country, he notices the GPS coordinates don't match his position on the map. As a matter of fact, he's at a well-defined road intersection, and the GPS coordinates place him on a hilltop to his right front, considerably more than 100 meters away. What's the problem? Is he in the wrong place? Is this an error on the map, or is the GPS malfunctioning?

Fortunately he's at a rather well-defined location. This allows him to analyze the problem quickly. First, he re-evaluates his position. By terrain association, he determines his position on the map is correct. He is, in fact, at the road intersection and not on some hilltop. Therefore, something must be happening to the GPS.

At this point in the scenario, some things need to be explained about the SLGR. There are several different sets on the market that meet the specifications to be called a SLGR. Almost all are non-developmental items purchased off-the-shelf to meet the needs of Desert Storm. Next, these sets have some accuracy problems in today's GPS environment. Last, they don't use standardized operating procedures. All the systems will produce the same results; however, the buttons, switches, viewing screens and means of estimating position accuracy are not the same. Because more than 10,000 GPS Trimpacks (AN/PSN-10s) are in the hands of the military, I use the Trimpack as a representative system for this scenario. (See Figure 1.)

Our BC is aware the SLGR is giving him bad coordinates, and he immediately starts a system check. Now let's take a look at a short system checklist. Keep in mind your set may be different than the AN/PSN-10. However, by using the manufacturer's handbook for your set, you should be able to check these or similar functions.

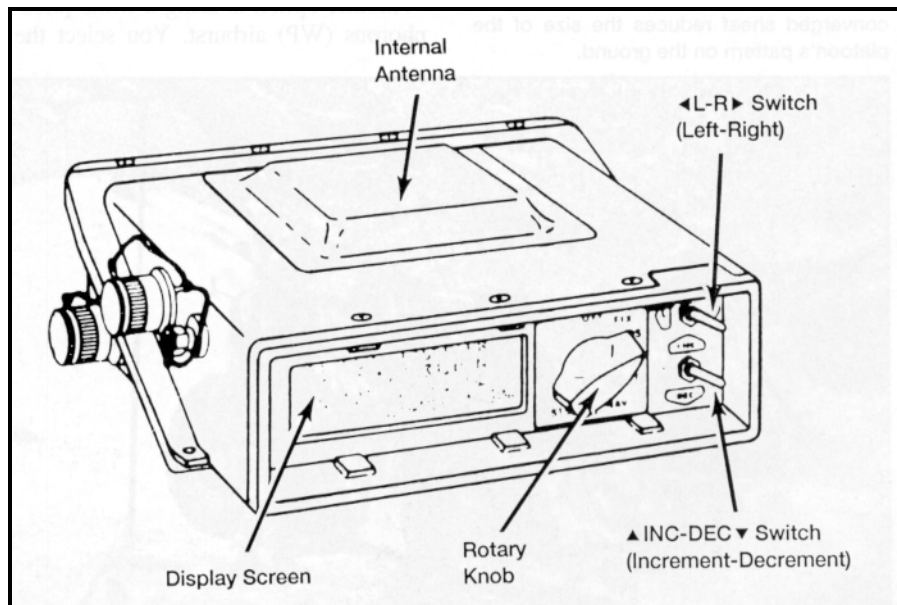**Is the system malfunctioning?** The system has a built-in, self-test at turn on.

Figure 1: The Trimpack (AN/PSN-10) SLGR. Representative of the various off-the-shelf GPS systems, there are about 10,000 Trimpacks in the military.

If a failure occurs, it will normally be noted at that time.

The most common fault that occurs during operation is power. You first check the system status and setup (STS) screen and note the GPS status. (See Figure 2.) If an error code is indicated, turn the system off and restart it. If the condition persists, turn the system off, change the battery and try again. If the condition continues, turn the set in to maintenance.

Are enough satellites (SVs) in view? The system must have at least three SVs to obtain a two-dimensional fix (2D) and four SVs to get a three-dimensional fix (3D). Again, the place to check is the STS screen. Note the number of SVs tracking and the GPS status. If anything other than "GPS OK" is shown, an SV geometry or signal problem is being encountered.

Also, the operator must realize that line-of-site must be possible between the current GPS location and the SVs. Hills, buildings and very dense foliage will mask your position. You may need to move to obtain a better fix. The AN/PSN-10 attempts to track SVs 360 degrees around the current position and above 10 degrees in altitude.

Is the horizontal datum set to correspond with the map? (See Figure 3.) When it comes to map reading, coordinates, targeting and positioning artillery assets, horizontal datum is rather new to our vocabulary. The problems associated with grid misalignment caused by multiple horizontal datums have been with us since man began surveying and making maps. However, it hasn't been a real issue until we started worldwide operations using combined forces and national assets with high-tech systems, such as GPS, that have global rather than regional capabilities.

Horizontal datum misalignment can cause errors in excess of several hundred meters. When comparing GPS coordinates to map coordinates, it's imperative the GPS horizontal datum be the same as the map datum.

Maps provided by the Defense Mapping Agency will indicate the horizontal datum used for a particular map, and most GPS systems have a datum selection menu. So you check the next STS screen (Figure 4) and verify the GPS datum coincides with the map datum.

You must do the same for the vertical datum. Most mapping in the world relates elevation to mean sea level. My representative GPS automatically uses mean sea
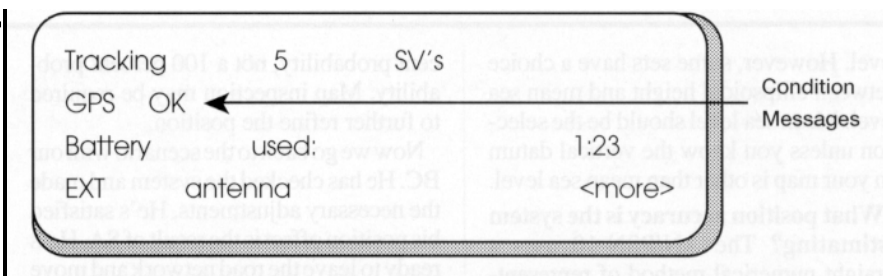

Figure 2: Status Screen with STS Displayed. You must check the system's operational status; if an error code is indicated, turn the system off and restart it.
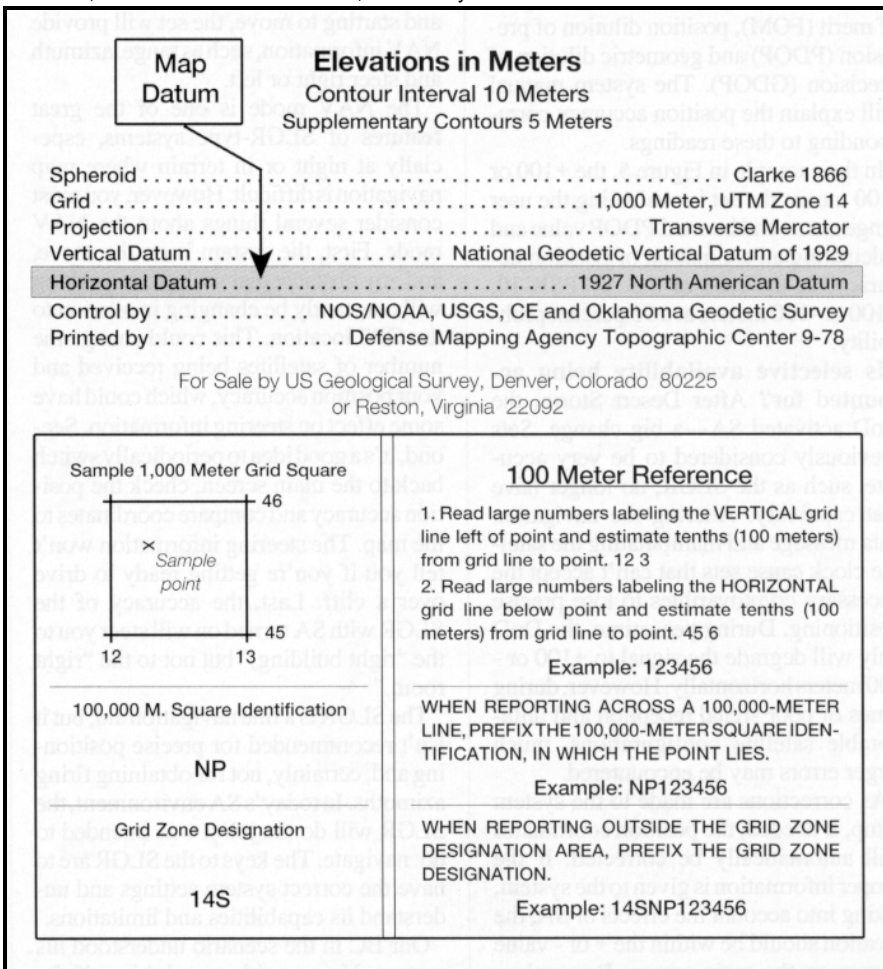

Figure 3. Horizontal Map Datum. The horizontal map datum on the GPS must be set to correspond with the map. Misalignment can cause errors in excess of several hundred meters.
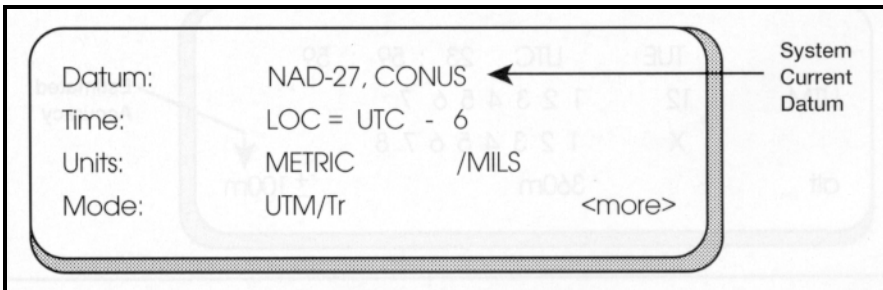

Figure 4. Status Screen with the System's Map Datum Displayed. You can verify the GPS datum and check it against the horizontal datum indicated on your map. Most GPS systems have a datum selection menu.

level. However, some sets have a choice between ellipsoidal height and mean sea level. Mean sea level should be the selection unless you know the vertical datum on your map is other than mean sea level.

What position accuracy is the system estimating? The AN/PSN-10 uses a straight numerical method of representing position accuracy. (See Figure 5.) Other sets use values, either numeric or alpha characters, associated with figure of merit (FOM), position dilution of precision (PDOP) and geometric dilution of precision (GDOP). The system manual will explain the position accuracy corresponding to these readings.

In the example in Figure 5, the +100 or -100 means the set is evaluating the user range errors and internal PDOP value and calculating an estimation of position accuracy, in the case of the AN/PSN-10, +100 or -100 meters at a 95 percent probability.

Is selective availability being accounted for? After Desert Storm, the DoD activated SA—a big change. Sets previously considered to be very accurate, such as the SLGR, no longer have that capability. Altering the navigation data message and manipulating the satellite clock cause sets that can't accept the necessary cryptovaribles to lose precise positioning. During peacetime, the DoD only will degrade the signal to +100 or -100 meters horizontally. However, during times of poor signal reception and unfavorable satellite configurations, much larger errors may be encountered.

As corrections are made to the system setup, if needed, the position coordinates will automatically be corrected. If the proper information is given to the system, taking into account the effects of SA, the location should be within the + or - value shown on the main screen. Remember, with the Trimpack GPS, this is a 95

percent probability, not a 100 percent probability. Map inspection may be required to further refine the position.

Now we go back to the scenario with our BC. He has checked the system and made the necessary adjustments. He's satisfied his position offset is the result of SA. He's ready to leave the road network and move cross-country, so he switches the system to the navigation (NAV) mode. After entering the final destination coordinates and starting to move, the set will provide NAV information, such as range, azimuth and steer right or left.

The NAV mode is one of the great features of SLGR-type systems, especially at night or in terrain where map navigation is difficult. However, you must consider several things about the NAV mode. First, the system is on the move, and any obstacle that will cause masking will constantly be changing in relation to the GPS location. This could change the number of satellites being received and your position accuracy, which could have some effect on steering information. Second, it's a good idea to periodically switch back to the main screen, check the position accuracy and compare coordinates to the map. The steering information won't tell you if you're getting ready to drive over a cliff. Last, the accuracy of the SLGR with SA turned on will steer you to the "right building," but not to the "right room."

The SLGR is a fine navigation aid, but it isn't recommended for precise positioning and, certainly, not for obtaining firing azimuths. In today's SA environment, the SLGR will do the job it was intended to do: navigate. The keys to the SLGR are to have the correct system settings and understand its capabilities and limitations.

Our BC in the scenario understood his system. He was able to ask himself the right questions and make setup corrections and was aware of the limitations caused by

SA. His SLGR will steer him to a point very close to his final destination.

SLGR and Inertial Surveying Systems

Due to the large circular and height errors caused by SA, SLGR capabilities are limited when used with inertial surveying systems, such as the position and azimuth determining system (PADS). The new Version 4 software for PADS has a GPS procedure, but it's for use with precision systems more accurate than the SLGR. Unless the tactical situation or a lack of survey control requires the use of SLGR, known survey control should be the choice. If the SLGR must be used with PADS, two possibilities present themselves.

1. If the SLGR is estimating an accuracy of +100 or -100 meters, its coordinates and a thorough map inspection should produce enough accuracy to initialize the PADS. Then you should move PADS to a known survey control point for the initial update. If the data used for the PADS initialization point exceeds PADS specifications by very much, the possibility exits that PADS may reject the update data.

2. If you can't move PADs to a known survey point, SLGR coordinates can be used for initialization and initial update at the same point. However, a starting point such as this must be treated as assumed, and the procedures for starting from assumed data must be adhered too. It isn't recommended that a second update point established with a SLGR be used to close a PADS survey. The inability of the SLGR to get a precise position will significantly increase the probability that the PADS will reject the update data.

As with our BC and the map datum, the PADS operator must ensure the spheroid selected corresponds to the GPS datum being used. A table showing spheroid and datum compatibility is in Change 3 to *TM 5-6675-308-12 The Position and Azimuth Determining System AN/USQ-70.*

The PLGR

When the precise lightweight GPS receiver (PLGR) AN/PSN-11 becomes a reality, the problems of standardization and SA will go away. The projected basis of issue calls for, essentially, the same system to be issued, in many cases, down to the section level. The PLGR is crypto-capable,
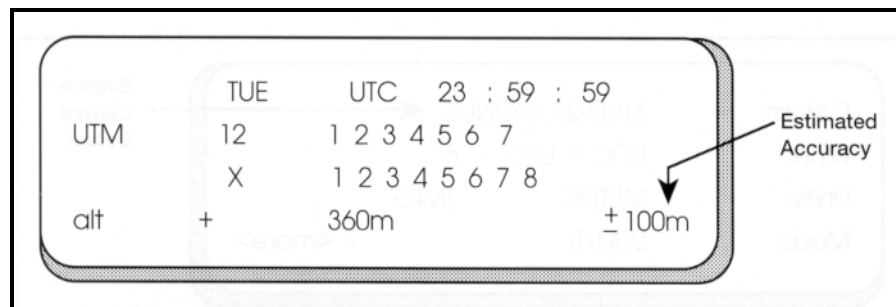

Figure 5. Status Screen with the System's Position Accuracy Displayed. This main screen shows the AN/PSN-10 estimates +100 or -100 meters (at 95 percent probability) using a straight numerical method of calculation. Other systems can use numerical or alpha values (see your user's manual).

allowing access to the precise positioning service. It can be held in one hand, weighing 2.8 pounds (with battery).

The current specification for PLGR accuracy is 10 meters circular error probable (CEP) horizontally and 10 meters probable error (PE) vertically. This means the PLGR will be more consistent and have better positioning and navigation solutions than the SLGR. The specifications call for enough precision for the PLGR to work with PADS' new Version 4 software GPS procedure and other inertial systems.

With this accuracy, the PLGR, along with a gyroscope for azimuth, will be able to provide position data and update points for most artillery systems, including our howitzers and the multiple-launch rocket system (MLRS). In many cases, we'll continue to need inertial systems for position accuracy when the PLGR is masked by terrain or has satellite outages. Additionally, the integrated PLGR will enhance the capabilities of future inertial systems by providing constant update data that may eliminate the need for zero-velocity stops.

The "first buy" of PLGRs for the Army is 11,000 systems; the 25th Infantry Division (Light) in Schofield Barracks, Hawaii, will test the PLGRs and fielding to other units is anticipated to be through FY 94. Priority will go to Force Package 1 (forward-deployed and contingency units) for the first buy. Depending on funding, the Army tentatively plans to buy 33,000 more PLGRs for fielding through FY 97.

As you can see, the transition from SLGR to PLGR will take some time, and until the PLGR is fully fielded, some units may have only SLGRs or a mix of systems. As long as the user understands each system's functions and capabilities, position and navigation errors will be avoided.

Charles E. St. Clair
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Firefinder Initialization with Limited Map or Survey Data

Two problems encountered by Firefinder radar sections during Operations Desert Shield and Storm were a shortage of maps and limited or nonexistent survey. Maps available were, more often than not, the wrong size or type. In many instances, survey was either incomplete or unavailable. In future deployments, radar sections may face the same problems.

Initialization with Limited or No Maps. A quick fix for this problem is to place firing chart paper on the map drum of the weapons location unit (WLU). To do this, first determine from your headquarters the primary search azimuth and enter it during initialization. Then place the radar location on the bottom center of the chart paper, leaving enough room to cover the area of interest and to be able to plot friendly artillery and maneuver units. This is now the starting point for labeling the north-south and east-west grid lines, basing them on the plotted radar location grid coordinates.

The map size may be designated from the options available in the initialization program. You also may want to extract marginal data from maps located at the tactical operations center (TOC). This will provide data such as the high and low datum plane, contour interval, grid zone designator, etc.

After the chart is mounted on the map drum and labeled, altitude data, if available, may be entered. One way to do this is to trace and label major contour data from a map on an overlay and mount it over the chart paper. If a map of the area is available but is the wrong size or type to use on the map drum, simply plot the grid location of a round that you've tracked on the map and manually "height correct" the location. A quicker but less accurate method is to label each grid square with an average altitude. More than one altitude may be needed per grid square in severe terrain. Finally, the quickest and most efficient method for determining altitude is to use a digital map of the area, if one is available.

Limited Survey Data. The following paragraphs describe methods to either establish or extend preliminary survey data for Firefinder radars when accurate maps are available. For more in-depth discussions of survey and hasty survey techniques, refer to *FM 6-2 Field Artillery Survey* and *FM 6-50 Field Artillery Cannon Battery*.

•No Survey Assets Available. Map spot the radar position for coordinates. Then set up an aiming circle with the azimuth scale set to the declination constant and float the magnetic needle to north to determine azimuth.

If time permits, map spot for general location and identify three prominent terrain features that can be identified on the ground and map. Set up the aiming circle, set the azimuth scales to the declination constant and float the magnetic needle to north. Measure grid azimuths to all three points. Then measure the vertical angle of the point to be used as the orienting point (far stake). Convert the azimuth to a back azimuth and plot it on the map. Where the three azimuth lines cross is the position of the aiming circle. Read the coordinates from the map using a coordinates scale. Use the azimuth and vertical angle to determine far-stake data. You can then determine far-stake distance from the map.

• Extending Survey Using Hasty Techniques. The radar site may be located within view of a survey control point, firing point, observation post or another surveyed point. If it's within 250 meters of the surveyed point, set up the aiming circle on the surveyed point. Then set the known azimuth from the survey point to the end of orienting line (EOL) on the aiming circle scale and, with the non-recording knob, place the aiming circle cross hairs on the EOL. Using the recording knob, turn to the near stake (radar site) and record the azimuth. This is the azimuth from the survey point to the near stake (radar site).

You can determine distance using the subtense chart in FM 6-50. Hold a two-meter bar horizontally over the radar site stake. Set the aiming circle scale to "0" mils and, using the non-recording knob, sight on the left end of the two-meter bar. Using the recording knob, turn a horizontal angle from the left end to the right end of the two-meter bar. Apply the subtense angle to the subtense chart in FM 6-50 and read the distance from the surveyed point to the radar site. Plot the azimuth and distance from the surveyed point to the radar site on the map and determine the coordinates using a coordinate scale.

There are other methods that work. However, experience has shown these methods will solve the problem of not having maps or survey data available.

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