Engineer

DESK COPY

THE MAGAZINE FOR ARMY ENGINEERS

SUMMER 1985

LEADERSHIP IN MAINTENANCE

ALSO: THE WALLMEISTER □ OBSTACLE PLANNING SIMULATION
NIGHT CROSSING □ BLAZING TRAILS

A Personal Viewpoint

by MAJ Charles Kershaw

"Whenever one surveys the forces of the battlefield," wrote S.L.A. Marshall in his masterpiece, *Men Against Fire*, "it is to see that fear is general among men, but to observe further that men are commonly loath that their fear will be expressed in specific acts which their comrades will recognize as cowardice. The majority are unwilling to take extraordinary risks and do not aspire to a hero's role, but they are equally unwilling that they should be considered the least worthy among those present."

It is, therefore, in Marshall's view, "vital that an army should foster the closest acquaintance among its soldiers, that it should seek to create groups of friends, centered if possible on someone identified as a 'natural' fighter, since it is their 'mutual acquaintanceship' which will ensure no one flinches or shirks. When a soldier is known to men who are around him, he has reason to fear losing the one thing he is likely to value more highly than life—his reputation as a man among other men."

Cohesion among soldiers has long been recognized as one of the most potent forces of the battlefield. Soldiers do not fight for the flag, their country, and the mission; soldiers fight for those they trust. Even after a combat-weary soldier has suffered the loss of comrades and leaders; is worn by fear and fatigue; has been subjected to bombs, bullets, and artillery; is out of ammunition, food, and water; and has survived all other fearful things associated with combat; the element that sustains his will to fight is cohesion. His motivation lies in the belief that no matter how bad the situation gets, his buddies in the foxholes on his left and right will not cut and run, but will sacrifice their lives to protect his flank.

Cohesion in military units exists on several planes. Soldiers bond vertically to their leaders and laterally to their comrades. They also develop unit loyalties. However, the cohesion that sustains units in combat develops at the lowest echelons of the unit, at the squad and fire team level.

All levels of cohesion are important. Each acts as a contributing vector that enhances mission accomplishment. But none is more important or as powerful as that developed in the foxhole.

"In the course of the airborne landings in Normandy during World War II," reported Marshall, "some units landed together while others were widely scattered. As the soldiers assembled on the ground, two types of groups emerged. One type was composed generally of soldiers known to each other, and the other type was composed generally of soldiers unknown to each other. Almost without exception, the soldiers in groups formed primarily of those unknown to each other contributed nothing to the success of the airborne invasion. This was despite their being from elite airborne units and despite their depending upon group effort for personal survival."

Just being members of the same unit, even one having an elite status and esteemed heritage, is not enough. Shared rigorous or dangerous experience fosters the development of group cohesion. And by groups, we mean face-to-face association that only rarely transcends the fire team or squad unit. And, within limits, the more dangerous the experience, the more rapidly cohesion develops.

Otto Skorzeny, Hitler's chief commando, recognized the importance of shared experience to small group cohesion and to mission when he stated, "If you need men for a dangerous mission, ask for volunteers. From these select the best. Train them in fellowship and fortitude and they will follow you into any danger, even to certain death."

Sharing dangerous activities is sufficient to make a soldier feel that he is part of a group, but it is not necessarily sufficient for the rest of the group to feel the same way toward him. For the latter to happen, the soldier must also share in the mundane activities of the group as well as the dangerous ones. A wise leader, therefore, ensures that personnel of combat units change as little as possible, so that comrades in peacetime maneuvers shall be comrades in war.

In 1800, Sir John Moore wrote in *Regulations for the Rifle Corps*, "Having formed his company he (the captain) will then arrange comrades. Every corporal, private, and bugler will select a comrade of the rank differing from his own, i.e. front rank and rear rank, and is never to change him without the permission of the captain. Comrades are always to have the same berth in quarters and, that they may be as little separated as possible in either barracks or the field, will join the same file on parade, and go on the same duties with arms."

As MG Norman D. Cota, commander of the 28th Infantry Division during World War II, observed, "Soldiers have a right to go into battle as members of a trained unit flanked by friends and associates and if possible led by leaders who have trained with them and whom they have come to trust." Smart leaders understand the significance of this thought to unit performance and train their units accordingly.

MAJ Charles Kershaw, an Infantry officer, is stationed with the 193rd Infantry Brigade in Panama. He was an instructor in the Command and Leadership Branch, Department of Combined Arms, at the Engineer School.

Engineer

VOLUME 15 NUMBER 2 SUMMER 85

UNITED STATES ARMY ENGINEER CENTER AND FORT BELVOIR, VA

Special thanks to LTC John B. Cunningham Jr., Bruce Barclay, CPT Joseph Miano, and the Department of Military Logistics.

On the Cover

PFC Anthony Q. Miller, C. Company, 11th Engineer Battalion, checks the radiator of his 5-ton dump truck during command motor stables (photo by 1LT L. J. Leto).

FEATURES

DEPARTMENTS

ENGINEER (ISSN 0046-1989) is an authorized publication of the U.S. Army Engineer Center and Fort Belvoir, VA. Unless specifically stated, material appearing herein does not necessarily reflect official policy, thinking nor endorsement by any agency of the U.S. Army. The words he, him, or his are used to represent personnel of either sex. All photographs contained herein are official U.S. Army photographs unless otherwise credited. The use of funds for printing this publication was approved by Headquarters, Department of the Army, on July 22, 1981. Material herein may be reprinted if credit is given to ENGINEER and to the author. ENGINEER's objectives are to provide a forum for the exchange of ideas, to inform and motivate, and to promote the professional development of all members of the Army engineer community. Direct correspondence with ENGINEER is authorized and encouraged. Inquiries, letters to the editor, commentaries, manuscripts, photographs and general correspondence should be sent to: ENGINEER Magazine, ATZA-TD-P Stop 291D, Fort Belvoir, VA 22060-5291. Phone: (703) 664-3082, AV 354. ENGINEER may be forwarded to personnel in military units. Address changes should be sent to ENGINEER. Subscriptions to ENGINEER are available through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. A check or money order payable to Superintendent of Documents, must accompany all subscription requests. Rates are $11.00 for domestic (including APO and FPO) addresses and $13.75 for foreign addresses. Individual copies are available at $3.00 per copy for domestic addresses and $3.75 for foreign addresses. Second Class postage paid at Fort Belvoir, VA, and additional mailing offices. POSTMASTER: send address changes to ENGINEER, ATZA-TD-P, Stop 291D, Fort Belvoir, VA 22060-5291.

PV2 Krzysztof Lopata, a Polish defector, now enjoys being a bridge specialist with the 5th Engineer Bn. at Ft. Leonard Wood, MO (photo by Steve Gaynor).

Polish Defector Joins Ranks

A 22-year-old Polish defector who escaped from his homeland and waited nine months in an Austrian refugee camp to come to the U.S. is stationed at Ft. Leonard Wood as a Combat Engineer.

PV2 Krzysztof Lopata, assigned to D Co., 5th Engineer Bn., grew up in Bielawa, a town of 40,000 residents in southwestern Poland.

He developed anti-Soviet feelings as a high school student. "For 15 years, I believed what the communists told me about America was true," Lopata said. "Every time I read a book about the U.S., I got a feeling they were lying about America."

In 1980 when Poland was suffering a severe food shortage, Lopata and many of his countrymen grew tired of Soviet propaganda which kept promising things would get better for the Polish people, while the communists continued to take 70 percent of the national product from Poland, according to Lopata.

"That was the reason we didn't have anything. We got what was left after they took it from us. They didn't provide for us first," said Lopata bitterly.

He joined the country's politically active labor union, Solidarity, at age 18. Lopata worked for the underground putting anti-Soviet posters on walls. He was also involved in strikes and demonstrations to free political prisoners.

Once while walking home from a party with a friend, Lopata was arrested by Polish police. He was charged with fighting with civilians and told he would spend a few months in jail until a court date was set for him.

Lopata spent about six months in jail, "the worst time of my life," he commented. "I was given minimal food—just enough to survive." He was allowed out of his cell only a half hour a day for exercise. He and other prisoners discussed defecting to other countries.

Lopata was finally released after his parents paid money to authorities. But he lost his job and was not allowed to attend school because he was considered to be criminal.

Lopata also faced the prospects of having to join the Polish army because every Pole 18 years or older must serve in the military.

"I decided it was time to defect," Lopata said.

He asked the government permission to leave Poland for a four-day vacation in Austria, which he was granted. He boarded a train and traveled to an Austrian refugee camp which he had heard about in Poland. There, Lopata received a letter from his parents telling him that his decision to leave Poland had been a good one because Polish police would have arrested him for his past involvement in Solidarity.

Lopata wanted to come to the U.S., and a family in Lincoln, NE, offered to sponsor him. In August 1982, Lopata arrived in America without knowing a word of English. The family sent him to a public high school in Lincoln where he took classes to learn how to speak English.

After spending only a few nights in his new country, Lopata got the idea to join the Army from his Polish roommate who planned to enlist. Lopata called an Army recruiter who told him he had to have a green resident's card to enlist. This meant that Lopata had to live in the U.S. one year before he could join the Army.

In May 1984, Lopata began basic training at Ft. Leonard Wood. He wants to work someday in the military intelligence field where he feels his ability to speak five languages will help him. He speaks Polish, English, Czechoslovakian, Russian, and German.

"Citizenship is very important to me," Lopata said. "In Poland, you never know what you're going to do or what's going to happen to you. I can enjoy my life here."

Have something for Engineer People? Please send your item (with photographs) to ENGINEER Magazine, ATZA-TD-P, Stop 291D Ft. Belvoir, VA 22060-5291.

Engineers Awarded

SSG James A. Kochara, B Co., 249th Engineer Bn. (CBT)(HVY), was the winner of the 1984 Sturgis Award. Serving as a squad leader, SSG Kochara was cited for leadership and technical competence during the 1984 Grafenwoeher Range Upgrade Program.

The 1984 Itschner Award for active Engineer units was awarded to B Co., 249th Engineer Bn. (CBT)(HVY). The unit was especially recognized for its efforts in GRAF '84 providing quality construction, significant cost savings, and training for its soldiers.

The 141st Engineer Co., NDARNG, and the 409th Engineer Co., WAUSAR, earned the 1984 Itschner Award for national guard and reserve units. Both units were recognized for their outstanding unit readiness, training, and work in community projects.

These awards are given annually to those individuals and units contributing most to the Corps of Engineers.

Other nominees for the awards were as follows:

Sturgis Award

EUSA
SFC Thomas E. Logan
C Co., 44th Engineer Bn.

TRADOC
SFC Paul C. Ondesko
HHC, 2nd Engineer Bn.

WESTCOM
SSG Franklin O. Reffitt
B Co., 65th Engineer Bn.

FORSCOM
SFC Roger D. Grant
36th Engineer Group

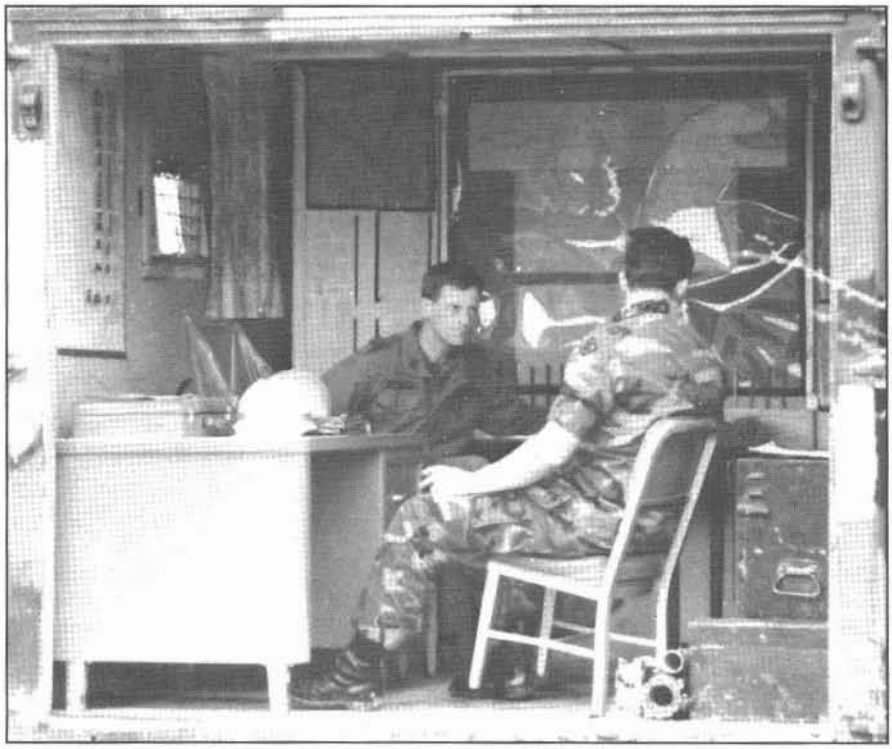
Itschner Award

EUSA
B Co., 802nd Engineer Bn.

TRADOC
C Co., 4th Engineer Bn.

WESTCOM
C Co., 65th Engineer Bn.

FORSCOM
B Co., 326th Engineer Bn.



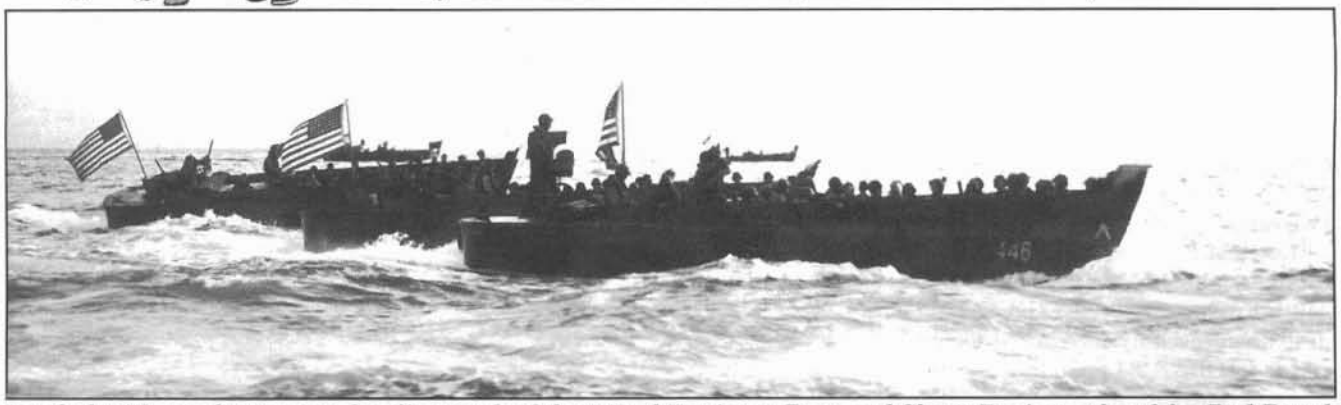
SSG James A. Kochara (above) discusses work requirements with a fellow platoon member during the GRAF '84 construction project.

Below, soldiers of B Co., 249th Engineer Bn., place concrete. The job site was always busy when concrete was delivered; cylinder tests were completed and flexural beams were tested to ensure a quality product was constructed (U.S. Army photos).

Past in Review

Amphibian Engineers in World War II

by Dr. William C. Baldwin, Historical Division, O.C.E.



Loaded with combat troops, landing craft of the 542nd Engineer Boat and Shore Regiment head for Red Beach, Tanahmerah Bay, New Guinea, on April 22, 1944 (U.S. Army photo).

In 1944, GEN Douglas MacArthur described the war in the Southwest Pacific as "an Engineer's war" because of the Engineer contributions to the success of air and amphibious operations. The role that Engineers played in supporting the air war against Japan is relatively well known, but the contribution of Army amphibian Engineers is less familiar.

From the beginning of World War II, the United States knew that it would have to conduct many landing operations against Germany and Japan. To support these missions, the Corps of Engineers created the Engineer Amphibian Command (EAC) at Camp Edwards, MA. The EAC trained and equipped six Engineer Amphibian Brigades, which were later renamed Engineer Special Brigades. The 1st Special Brigade participated in the Allied landings on the North African coast and later supported the amphibious operations in Sicily and southern Italy. In June 1944, the 1st, 5th, and 6th Engineer Special Brigades operated Omaha and Utah beaches during the Normandy Invasion.

In Europe the special brigades were primarily shore Engineers, but in MacArthur's Southwest Pacific Area (SWPA), the 2nd, 3rd, and 4th Special Brigades were both boat and shore units. Each special brigade in SWPA had three Boat and Shore Regiments which landed men, equipment, and supplies, and also transported them in a fleet of small Engineer-operated landing craft.

During 1942 and 1943, MacArthur's forces moved along northern coast of New Guinea in a series of hard-fought overland and shore-to-shore amphibious assaults. In October 1943, the 2nd Engineer Special Brigade landed Australian troops near the strategically important village of Finschhafen. A detachment of the brigade's 532nd Boat and Shore Regiment remained on the beach to help the Australians defend it from seaborne counterattack.

As dawn approached on October 17, the defenders heard the faint sound of boats gliding toward the beach. PVT Nathan Van Noy Jr. and CPL Stephen Popa rushed to their .50-caliber machine gun position just a few yards from the water line.

Slowly, the silhouettes of Japanese landing barges came into view. The Australians and American Engineers farther up the beach opened fire, but Van Noy, the gunner, waited until the barges dropped their ramps. As the Japanese stormed onto the beach, Van Noy opened fire, killing many of the invaders. A hail of Japanese grenades shattered Van Noy's leg and wounded Popa. In spite of their wounds, the two Engineers continued to fire.

After the Allied troops had repulsed the Japanese raid, they found Van Noy dead, his finger still on the trigger of his empty machine gun, and Popa severely wounded. Popa received a Silver Star and Van Noy became the first Engineer enlisted man in World War II to receive the Medal of Honor.

The Engineer Special Brigades participated in many of the remaining campaigns in the Pacific, including Leyte, Luzon, and Okinawa. In both Europe and the Pacific, these specially trained and equipped Engineer units made an important contribution to the success of American amphibious operations.

Suggestions for further reading:

BG William F. Heavey, *Down Ramp! The Story of Army Amphibian Engineers*

HQ Army Forces, Pacific, Office of the Chief Engineer, *Engineers of the Southwest Pacific 1941-1945,* Volume IV: *Amphibian Engineer Operations*

"Past in Review" is ENGINEER's new historical department regularly sponsored by the Historical Division, O.C.E.

Idaho National Guard...Par for the Course

Members of the maintenance and heavy equipment sections, 129th Engineer Co., Idaho Army National Guard, are assisting with the construction of the Nampa Public Golf Course.

"The National Guard agreed to assist with the project after voters there rejected a bond election to finance the project. It's an all-volunteer, community effort," said Mr. Mike King, assistant city engineer. "We couldn't do this without the help of the National Guard. It would take 10 years to move all the earth the Engineers are moving in the eight days they are working here."

"With our two front-end loaders, two 5-ton dump trucks, a caterpillar, and a road grader, we are moving 10,000 cubic yards of dirt to make way for roads, sand traps and small lakes," said SSG Michael A. Dela Garza, project NCOIC.

Using front-end loaders and 5-ton dump trucks, Engineers from the Idaho Army National Guard incorporate military skills into the excavation work for a community golf course project (photo by SSG Lucia M. Lammers).

According to King, several local business are donating their specialty items to complete the project. "A gas station is donating diesel for the National Guard equipment; and there's everything from trees and grass seed to well drilling and free architectural plans for the club house to local farmers contributing their time and equipment," said King. "The Army National Guard will have contributed over 1,250 manhours to the $1.2 million project once it is completed."

The construction platoon of the 129th Engineer Co. may become involved with the construction of footbridges and detail work of the lakes and ponds, according to King.

New Engineer Units in the National Guard

A new company-sized unit is being activated into the Minnesota Army National Guard. The new C Company of the 142nd Engineer Bn. (CBT)(HVY) will be based at Camp Ripley, MN. It will be capable of performing general engineering tasks such as construction and maintenance of heavy equipment, pipeline systems, roads, utilities, structures, airfields, and bridging. Its wartime mission is to support an Army corps or division engaged in combat.

The headquarters of the 142nd Engineer Bn. is being established in Fargo, ND, as part of the North Dakota Army National Guard (NODAK). The NODAK Guard is also activating A Company at Grand Forks and B Company at Wahpeton. D Company will be part of the Michigan National Guard in Augusta. These units are being activated as a result of the deactivation of an Engineer Battalion in Ft. Drum, NY.

Engineer School to Move

The Secretary of the Army has approved plans to move the U.S. Army Engineer School from Ft. Belvoir to Ft. Leonard Wood in 1989.

Relocating the School, along with the 902nd Engineer Co. (AFB), should save the Army more than $23 million annually, Army officials said. This effort will consolidate and standardize the training of Engineers and reduce equipment and manpower duplication now existing because of the separate locations. The move will also improve training by lifting the restrictions caused by the Ft. Belvoir urban area. New facilities will be constructed , and existing facilities will be converted to accommodate expanded training requirements for Engineers.

For further information, contact LTC James P. King, director of the Engineer Center Transition Office at Ft. Leonard Wood (AV 581-2272). COL Don W. Barber, DOTD, is the point of contact at Ft. Belvoir (AV 354-2188).

CLEAR THE WAY

by MG Richard S. Kem, Commandant, U.S. Army Engineer School

Maintenance and Peer Leadership

The military audience must receive the maintenance message.

Peer leadership in maintenance management is an often overlooked resource that can bring significant results.

Maintenance is a very great nail that anchors everything we strive to accomplish.

Maintenance is a simple process involving equally simple functions, yet we seem to have inordinate difficulty accomplishing it. And when "The General" talks about maintenance, we don't always hear what he is saying. But when our peers speak . . . we listen.

Can you remember the commencement speech given at the graduation from your last military course? Probably not. The advice of someone with many years of experience is often ignored because it often sounds like a "war-story" from an old soldier who has lost touch with today's Army. No wonder the Chief of Engineer Branch advises all EOBC students to "plan on getting dirty, greasy, and muddy" with their soldiers during their early assignments.

At times, I feel my credibility is questioned when talking to company commanders about maintenance. They say, "Yes, Sir," but they are suspicious because it has been many years since I was in charge of a unit motor pool. My credibility, however, improves when I talk to pre-command course colonels who are about to become brigade commanders.

Peer leadership in maintenance mangement is an often overlooked resource that can bring significant results. If you have not faced the situation before, the chances are that one of your peers has. Instead of sending the battalion maintenance officer or battalion XO to "fix" Company X's problems, have the company commander spend time discussing his problems with the commander of Company Y who is doing well with his maintenance. Done with patience, this can have an amazing effect.

The contents of this issue stress other ways of achieving success. In his article,"*Maintenance Management,*" LTC Strom emphasizes the importance of defining roles and coordinating functions.

Capitalize on recent experience when placing people in staff positions. A former company commander can put his experience to good use as a BMO. Although a former company commander can be useful in many staff positions, the BMO is the position most in need of his skills.

The same situation exists in a formal training environment. A seasoned captain who has commanded a company lends great credibility to both basic and advanced officer classes. Such an officer is a tremendous resource for his peers, and everyone can make good use of his experience in maintenance. The important thing is that he communicates his ideas and that his peers forget their pride and listen to him.

Other articles in this issue discuss formal training in maintenance. One article shows how Engineers in the 52F MOS receive the technical training to repair gas turbine engine driven equipment. Another identifies the problem of providing training for the utilities equipment repairer, then offers two solutions.

Remember the poem that blames the fall of Britain on a nail? Maintenance is a very great nail that anchors everything we strive to accomplish. The military audience must receive the maintenance message, and this audience will be more receptive when that message comes from a peer whose recent experience validates what he is saying.

by CSM Charles T. Tucker, U.S. Army Engineer Center & School

NCOs Face a Dual Role in Maintenance

Good maintenance does not just happen. It requires prior planning and strong leadership. In fact, leadership is more important in maintenance than any other area supervised by NCOs.

NCOs face a dual role in today's Army—that of teacher and supervisor. This means they must be experts with their equipment and know everything about it. That is, what its purpose is, how to use it, and what the maintenance standards are.

In addition, NCOs must teach their soldiers how to maintain their equipment and ensure that the equipment is, in fact, being maintained. They must ensure that these repairs and other services are within the capability of their men and that these factors are made known to second and third echelons.

NCOs must spend considerable time in maintenance-related functions and feel comfortable in this area. They must understand the system and expect their subordinates to know and understand how the system applies to particular skill levels or job responsibilities. Some of the particular areas that the NCO should stress are outlined as follows:

Record Keeping: Good record keeping is a must. The key to a successful maintenance program is accurate records properly using the Army's Maintenance Management System (TAMMS).

PLL (Prescribed Load List): Spend money to support your maintenance program. You cannot afford to fund slow-moving items. Maintenance NCOs must review the PLL to ensure that the repair parts are command-supported and that excess is not being maintained at any time.

Use of Publications: NCOs must ensure their 12 series are current. Maintaining our equipment is very complex in some cases. Personnel cannot be expected to remember the step-by-step process for accomplishing maintenance functions. NCOs must ensure that the proper manuals are available and their personnel use them correctly to guide them through these steps.

Scheduled Maintenance Periods: This means NCOs must be present and guide their subordinates through the proper maintenance steps.

Scheduled Maintenance Services: This means accomplishing scheduled maintenance services as outlined in the appropriate TMs.

Oil Analysis Program: This program is probably one of the most cost-effective programs we have in the Army. NCOs must ensure that their program is workable and responsive.

Equipment Calibration Program: NCOs should establish a system that provides a means of ensuring that equipment is being calibrated on a scheduled basis.

Installation of Repair Parts: Repair parts should be safeguarded and installed immediately upon receipt.

Obtaining and Using Maintenance Personnel: There is a shortage of assigned Engineer maintenance personnel (62B). The NCO support chain must be aware of this shortage and follow up on the status of obtaining replacement personnel in a timely manner. In today's environment where personnel shortages exist, NCOs are prone to borrow from the motor pool to meet their personnel requirements. NCOs should make sure mechanics are doing mechanical work, which is what they are trained to do.

OJT Program: The NCOs have the responsibility to train their maintenance personnel. Many of the maintenance personnel reporting to units are just out of the Army school system and are nothing more than apprentices.

Dispatching Procedures: NCOs must establish control of their equipment. This is done by establishing a good dispatch program.

If all NCOs maintain good daily maintenance management procedures, such as those I have just outlined, we can improve our maintenance posture and reduce operating costs tremendously. This is especially important for Engineers because of all the heavy equipment required to execute our mission. We may not like maintenance, but keeping our equipment running properly is surely better than having our Engineer equipment stall out in the middle of a battlefield.

Letters to the Editor

Kiss of Death . . . Knock of Opportunity

I have just read the Fall 1984 issue of your magazine and wish to make a brief comment about LTC Barry W. Levine's article entitled *"Command of an Initial Entry Training Company."*

As the former commander of a Combat Support Company in a TOE armor battalion and later a TDA cavalry troop which was organized under the "One Station Unit Training" concept, I must agree that commanding an initial entry training organization can be an outstanding alternative for officers wanting to command. The training command was the highlight of my career.

Two facets of such a command stand out as elements of a training assignment. First is the nearly absolute high standard of performance by the training cadre. The caliber of drill instructors cannot be underestimated. Sure there may be ups and downs, but nowhere else is a young commander likely to have nearly hand-picked people. Second is the training command which is the place where the young officer can actually see and measure the results of his efforts, his policies, his leadership. Nothing can top the feeling of getting a Christmas card from parents you have never met thanking you for the positive effect your training had on their son.

As LTC Levine stated, the best system for supplying company grade officers to IET positions is to get them with TOE experience. That way they have a better sensing of the quality of their training and the standards that will be expected in the field. In my experience we usually found that the training center had higher expectations of performance, discipline, military bearing, and stamina than the units who ultimately received our soldiers.

An officer assigned to IET should never think that his career has received the "kiss of death" as I had been led to believe. Rather, he or she should think of it as the knock of opportunity.

CPT James C. Allard
Public Affairs Officer
HQ, 2nd Support Command (CORPS)

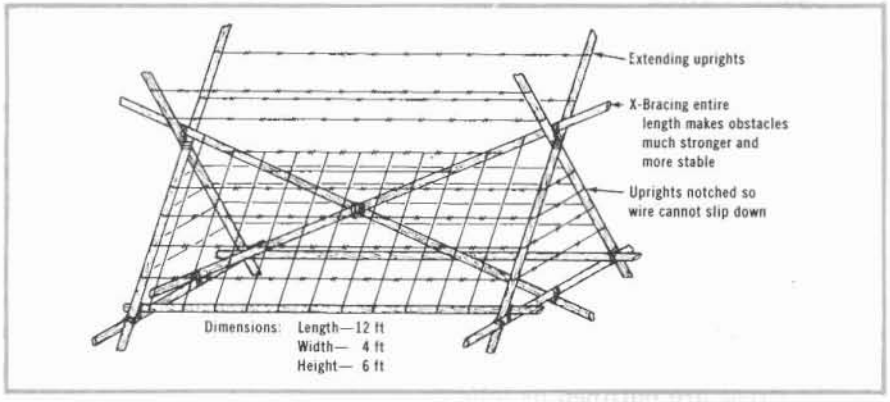
Building a Better Knife Rest

This worked for us. During our annual training (AT) held at Camp Ripley, MN, in January 1985, our squad was tasked to build obstacles to support an infantry company. After we had built the "knife rest" (FM 5-34, *Engineer Field Data*, Figure 4-26), I noticed some of its shortcomings, so I set out to design a modified version.

One of the shortcomings of the knife rest is it can easily be moved by a breaching party due to its height and weight. Also, in cold climates, obstacles must be frozen to the ground so they cannot be moved. The knife rest has virtually no area on the ground to be frozen in.

The modified version can be built by the same number of people and uses almost the same amount of wire. The X-bracing in the center makes this obstacle much stronger and more stable. It also allows the obstacle to be built higher (6 feet as opposed to 1.2 meters) making it harder to breach and less affected by the depth of the snow. Being a higher obstacle, it will not have to be raised as often.

The two bottom braces give a larger area to freeze in, in cold climates and make the obstacle more stable. Poles may be placed across these bottom braces (crisscrossed) and frozen in to make this obstacle impossible to move. Extending the uprights about 6 feet above the X-bracing would cause the breaching party to be climbing at a backwards angle in order to climb over it. Also, the "V" formed by these uprights is a natural saddle for concertina wire.



Because it is very stable, it can withstand being transported many times with little damage. We notched the uprights where the wire mated them; plus we wrapped the wire around them to keep the wire in place and impossible to move. As I said, this worked for us.

SGT Richard Routon
Assistant Training NCO
890th Engineer Company
Tennessee Army National Guard

NOTE: Although SGT Routon's design is a modified version of the knife rest in FM 5-34, the following facts should be noted.

- The design does not address construction using metal. With a metal frame, the knife rest can be used as an effective underwater obstacle.
- The knife rest is not easily removed if it is covered by fire and under friendly observation at all times.
- The design may have just been suitable for one exercise.

Built any bigger and better knife rests lately? How about another new wire obstacle or a new way to demolish a bridge? ENGINEER invites you to share your *Engineer Ingenuity* with the rest of the Engineer community.

Directorate of Combat Developments (DCD)

Mobility Update:

The robotic obstacle breaching assault tank (ROBAT) should be fielded by late FY 87. It will consist of an M-60 chassis modified to accommodate a track-width mine roller or plow, two top-mounted mine-clearing line charges, and a clear-lane marking system. It may be operated manually or by remote control. Contracts will be awarded soon for the remote control system and the logistics support package.

Bridging Update:

The light assault bridge (LAB) has been developed to meet the needs of the light infantry division and rapid deployment forces. The LAB is a lightweight, double-fold scissors bridge designed to span a 23-meter gap. It is trailer-mounted, military load Class 30. It is also air transportable in a C-141 aircraft and can be moved, launched, and retrieved by a variety of vehicles, 5-ton and over. Prototype testing will begin between late FY 86 and early FY 87.

Countermobility Update:

The tactical explosive system (TEXS) is a new antitank ditching system composed of off-the-shelf components. It combines blasting agent ingredients, a mixing and pumping unit, a small emplacement excavator (SEE) with trencher attachment, and 4-inch PVC pipe to produce a ditch 13 meters wide and 3 to 4 meters deep. Emplacement time is significantly less than conventional construction time using bulldozers and bucket loaders. The system is expected to be fielded by early FY 88.

Directorate of Evaluation and Standardization (DOES)

Graduation Follow-up Evaluations:

For the past year, DOES has been conducting graduate follow-up evaluations of Engineer MOS training. Evaluation results are being sent to units participating in the evaluations and appropriate Ft. Belvoir and Ft. Leonard Wood organizations. The next group will be surveyed during the last quarter of FY 85 (by early September). This group includes:

- 62H10 Concrete/Asphalt Equipment Operator
- 52F10 Turbine Engine Driven Generator Repairman
- 52G10 Transmission and Distribution Specialist

This directorate thanks those who have already contributed to these

Graduation Follow-up Evaluations: (continued)

evaluations and hopes to receive continued support from other Engineers in the field.

Defense Mapping School (DMS)

Construction Draftsman Course Redesigned:

The Construction Drafting Division, Department of Cartography and Applied Graphics, has totally redesigned Construction Draftsman (81B10) training. The 12-week resident course teaches enlisted and selected civilian students apprentice-level skills necessary to perform construction drafting tasks. The course is divided into three four-week phases.

The first four weeks provide the students with the basics required to draft engineering drawings. Students learn the use of standard drafting instruments, orthographic sketching, projected and pictorial drawing techniques, and the dimensioning of engineering drawings. After this phase, the students can complete single and multiview detail drawings and pictorial asemblies.

During the second phase, the students learn those skills necessary to draft architectural working drawings. This phase includes architects' and metric scales manipulation, architectural detailing practices, material estimating, and metric conventions. The students will complete foundation plans; floor plans; wall sections; building details; electrical, heating, ventilating, or air conditioning plans; and plumbing plans.

During the last four weeks, the students learn structural and civil engineering drafting skills. This includes drafting of structural detail drawings that communicate the designer's intent, plus roadway drawings, earthwork volumes, and mass curves to develop critical paths used in construction management. Students learn to prepare charts and graphs during this phase.

The complete revision of the course enables the Defense Mapping School to provide a better trained soldier for the field units.

Department of Military Engineering (DME)

Bridge Erection Boat:

Procedures to air transport the bridge erection boat, shallow draft, may soon be available for the field, according to MAJ Christopher P. Werle, Chief of Bridging Branch at the Engineer School. Meanwhile, a list of procedures acquired from the 82nd Airborne is being compiled for the next ENGINEER. Any unit needing help before then should contact MAJ Werle at (703) 664-2378 (AV 354).

Directorate of Training and Doctrine (DOTD)

MGB Link Reinforcement Set:

Our Winter 1984–85 "News and Notes" featured an article about the link reinforcement set (LRS). As stated, the LRS can maintain a Class 60 load while extending the gap-crossing capabilities of the MGB from 109 feet (33.2 meters) to 163 feet (49.7 meters). The additional construction material, however, increases manpower and construction time requirements. The chart below illustrates how the LRS affects a double-story, single span MGB.

Double-Story, Single Span MGB

	Normal Set			With LRS		
Number of Bays [1]	13	18	22	13	18	22
Personnel (NCO/Enl)	1/24	1/24	1/24	1/32	1/32	1/32
Daytime[2, 3]	1½ hr	1¾ hr	2 hr	2 hr	2¼ hr	2½ hr
Nighttime[2, 3]	2 hr	2¼ hr	3 hr	2¼ hr	2¾ hr	3 hr

[1]Number of bays does not include two end bays each.

[2]Increase time by 20 percent for untrained troops.

[3]Increase time by 30 percent for inclement weather.

The manpower requirements for installing the LRS is eight additional soldiers, divided into two four-man teams, one team on each side of the bridge. All LRS components are portable, but will require one additional truck and trailer to carry nearly 10,000 pounds of materials.

Note that there is little increase in construction time. This is because all LRS components can be installed simultaneously with the construction of the MGB superstructure.

FM 5-102, Countermobility:

FM 31-10, *Denial Operations and Barriers,* was superceded by FM 5-102, *Countermobility.* Distribution began in March 1985 for the new manual which can be acquired through normal publication channels.

Other coordinating drafts being disseminated to the field are as follows:

FM 5-34, *Engineer Field Data*	4th Quarter, 1985
FM 5-105, *Engineer Topographic Operations*	3rd Quarter, 1985
TC 5-103, *Survivability*	1st Quarter, 1986
TC 5-104, *General Engineering Drills*	3rd Quarter, 1985
ARTEP 5-25J, *Engineer Units: ABN, AMBL, INF DIV AND SEP (Div 86)*	April 1985
ARTEP 5-64J, *Engineer Bridge Companies, Corps*	April 1985

School News

Doctrinal Literature:

New developments in the doctrinal arena have been officially announced with the publication of the new TRADOC Regulation 11-7, *Operational Concepts and Army Doctrine.* The regulation reemphasizes the concept that service school instructors are the subject matter experts within their functional areas and the principal writers of Army doctrine. The regulation further states that, with the exception of joint manuals, all doctrinal field manuals and drill training circulars will be coordinated as field circulars. This procedure provides a faster means of disseminating interim doctrine and training material to the field.

The Engineer School is developing field circulars on the Brigade/Task Force Engineer and on Airfield Damage Repair to satisfy perceived needs for published guidance in those areas. Other field circulars will be developed as input from the field dictates.

ARTEP News:

To correct identified weaknesses in the training system, it has become necessary to expand the ARTEP to make it a total training strategy for each element within a unit. This is accomplished by formatting the ARTEP into a series of mission training plans (MTP), each designed to provide a complete training guide for a specific echelon within a unit. Each ARTEP consists of a training matrix, training plans, detailed training and evaluation outlines, drills, situational training exercises (STX) as applicable, and unit test guidance. This design represents evolutionary progress and a natural extension of the ARTEP philosophy—a training program designed to prepare us today to fight on the AirLand battlefield tomorrow and win.

First production models distributed to the field will be MTPs for the Engineer battalion, light infantry division, and Engineer battalion, armored infantry (MECH) division. Each battalion will have an MTP for their headquarters company and battalion staff, one for the Engineer company, and one for the Engineer squad and platoon.

The coordinating drafts for these publications should be completed by Oct. 1, 1985; and the final drafts should be prepared for DA publication by July 1, 1986. By 1989, all ARTEPs, as we know them, should be converted to more than 50 echelon-oriented MTPs.

The Engineer School welcomes all suggestions and recommendations for improving these publications. Please send your comments to Commandant, U.S. Army Engineer School, ATZA-TD-D, Ft. Belvoir, VA 22060-5291.

ENGINEER recently distributed a readership survey to units randomly selected from our mailing list. Please complete these surveys and return them as soon as possible. The results help us to evaluate our magazine and to publish the material which our readers like to see.

ENGINEER welcomes articles, photographs, ideas, and comments at any time from all our readers.

NCO Education System Quiz

How much do you know about the Noncommissioned Officer Education System? The following quiz was given at a recent TRADOC Commander's Conference. If you are qualified on the subject of NCOES and AR 351-1, then you should be able to answer all of these questions correctly.

1. When does an NCO become skill level 5 qualified?
   a. Upon graduation from Sergeants Major Academy.
   b. Upon graduation from First Sergeants Course.
   c. Upon promotion to master sergeant (E8).
   d. Upon selection for promotion to master sergeant (E7)(P).
2. At which organizational level must an order of merit list be established and maintained for PLDC and BNCOC?
   a. Company.
   b. Battalion and brigade.
   c. Battalion and separate company.
   d. Division.
3. Which is one of the main objectives of NCOES as outlined in AR 351-1 (Individual Military Education and Training)?
   a. To familiarize soldiers with their leadership responsibilities at various skill levels.
   b. To improve unit readiness and collective mission proficiency of NCOs and subordinate soldiers.
   c. To improve individual technical proficiency.
   d. To provide a formal training base for each skill level.
4. Who has first priority to attend the Primary Leadership Development Course (PLDC)?
   a. Those E5s who have not attended PNCOC.
   b. Soldiers selected for promotion of E5 and E6s and E5s who have not previously attended an NCOES leadership course.
   c. E4s who, because of unit NCO shortages, are performing in E6 and E5 leadership positions.
   d. Soldiers, regardless of position, who the local commands have recognized as needing training.
5. Which of the following is a prerequisite a soldier must meet to be placed on an order of merit list?
   a. Passed the Army Physical Readiness Test within the past 12 months.
   b. Be recommended by the unit first sergeant.
   c. Passed the SQT within the past six months.
   d. Be trained (initialed off) on 70 percent of all MOS tasks in the individual soldiers job book within the past six months.
6. When is a soldier qualified to wear the numeral 3 on the NCO professional development ribbon?
   a. Upon completion of Basic NCO Course.
   b. Upon graduation from Primary Technical Course.
   c. Upon graduation from First Sergeants Course.
   d. Upon graduation from Advanced NCO Course.
7. How are soldiers selected to attend advanced Noncommissioned Officers Course (ANCOC)?
   a. MACOM commanders are responsible for submitting nominees to MILPERCEN who will select attendees, based on availability of allocations for each MOS.
   b. DA selection board, centrally managed by MILPERCEN, will select soldiers to attend ANCOC from a list of nominees submitted by MACOMs.
   c. DA selection board, centrally managed by MILPERCEN will select soldiers to attend ANCOC.
   d. DA selection board, centrally managed by MILPERCEN, will select soldiers to attend ANCOC from a list of soldiers that have submitted a request for schooling.
8. Which soldiers have second priority for attending NCOES resident school courses?
   a. Soldiers who have been assigned to the unit less than 90 days.
   b. Soldiers who are pending assignment to or occupying a duty position within their PMOS in grades higher than their present grade.
   c. Soldiers undergoing supervised-on-the-job-training.
   d. Soldiers who have requested enrollment in correspondence course programs.
9. What is the normal length of basic NCO courses?
   a. Four-week core with one week add-on option by local commander.
   b. Eight-week core with one week add-on option by local comander.
   c. Course length varies by MOS. Local commanders are permitted to extend POI by one week.
   d. Six weeks in length with one week add-on option by local commander.
10. How soon after being promoted to E5 or E6 must a soldier be sent to the appropriate PTC/BTC?
    a. MILPERCEN will automatically select the soldiers for attendance within 30 days of the date the soldier attains E5/E6 promotion list status.
    b. Commanders will nominate to MILPERCEN those active component soldiers qualified to attend resident PTC and BTC within 30 days of the date the soldier attains E5/E6 promotion list status.
    c. MILPERCEN will automatically select the soldiers for attendance within 90 days of the date the soldier attains E5/E6 promotion list status.
    d. Commanders will nominate to MILPERCEN those active component soldiers qualified to attend resident PTC and BTC within 60 days of the date the soldier attains E5/E6 promotion list status.
11. How are NCOs selected to attend the First Seargents Course?
    a. Based on projected vacancies, MACOM commanders select all active component NCOs that attend the First Sergeants Course.
    b. MILPERCEN will select the First Sergeants Course attendees from a list of nominees submitted the the MACOMS.
    c. An annual DA selection board, centrally managed by MILPERCEN, will select NCOs to attend the First Sergeants Course.
    d. Based on programmed quotas, MACOM commanders will select First Sergeants Course attendees, who will be sent TDY to the course; and, MILPERCEN will select attendees for TDY enroute (PCS).

Answers: 1:c; 2:c; 3:b; 4:b; 5:d; 6:d; 7:c; 8:b; 9:c; 10:b; 11:d.

Maintenance Management

by LTC Roger C. Strom

Soldiers of HHC, 11th Engineer Battalion (CBT)(HVY) carefully use appropriate manuals to ensure this M-880 5/4-ton truck is properly lubed (photo by 1LT L. J. Leto).

If there is one area in which the Army has failed over the years, it must be in its training of maintenance management. While we often see success in maintenance programs, that success is usually attributable to individual effort rather than a systematic approach to maintenance training.

Nobody likes maintenance! There is little glamour in the motor pool, and the drama of the backline holds no one's interest for long. Maintenance isn't fun the way a construction project can be. But without it, nothing works . . . and higher headquarters wants to know what is wrong almost on a daily basis.

A battalion commander is faced with the myriad challenges of an Engineer battalion. "Get your maintenance up," says the brigade commander, and off the battalion commander charges.

Some Myths about Maintenance:

Myth 1: Absolute command participation in motor stables will improve the unit's overall maintenance posture.

Fact: That's dead wrong! Having the entire chain of command at motor stables just confuses things.

Myth 2: The most important link in the maintenance chain is the operator.

Fact: That's also wrong! Operators come and go; it's the first-line supervisor who's usually around the longest.

Myth 3: If you teach a junior officer how to do what the mechanic does and how to fill out forms properly, he will be a better maintenance manager.

Fact: Wrong again! Teach a lieutenant how to manage, not how to fix. If he learns how to pack wheel bearings,

he will be frustrated when he doesn't get to do it on the job. And if he does succeed in packing a wheel bearing, the mechanic will sit back and let him do the rest of the job.

Myth 4: The OR rate is the most important measure of maintenance effectiveness that, when combined with PLL zero balances, provides a quantifiable measure of success.

Fact: OR rates are indicators of past trends; the result of efforts made. The evaluation measurement of OR rate performance fosters a climate wherein integrity can be easily threatened. Measuring PLL lines at zero balance leads to parts remaining in the bins instead of going on the vehicle they were intended for. Likewise, it may become easier to drop a line rather than reflect it at zero balance and suffer the commander's wrath.

Proper management of maintenance is nothing more than the correct analysis of functions to be performed and ensuring that the wherewithal to perform the functions is available. Yet, it is in this statement that a paradox arises. If maintenance management is basically so simple, why is it likewise so difficult to accomplish?

As mentioned before, maintenance is not fun. Because it is not fun, the tendency exists to concentrate on form and appearance rather than function. How many inspections concentrate on the fringe file and stockage lists, ignoring the fact that the PLL clerk does not know how to use a -20P manual? If a scheduled application of a lube order is properly documented, is the mechanic or operator ever questioned as to the timing of the service or how long it took to do the job?

Success in maintenance management is knowing who does what, with what, when, and how. No vehicles are repaired by filling out a form; no part is ordered and placed on a vehicle by merely completing a requisition. Likewise, the fault noted on DA Form 2404 cannot be corrected if the part, properly requisitioned and received, is not put on the vehicle for want of time to get the vehicle into the shop.

Proper maintenance management follows most of the principles of the AirLand Battle with great facility. The most important principle is, however, synchronization. Synchronization in maintenance management means ensuring that the different actors know their roles and the roles of those they come in contact with in the maintenance process.

1LT Brendan J. O'Shea, platoon leader, spot-checks the maintenance on a 5-ton dump truck to ensure proper PMCS procedures are followed (photo by 1LT L. J. Leto).

The ***operator*** must know that he has certain responsibilities for maintenance of his vehicles. He must be shown that there is a manual that outlines these responsibilities and that the most important part of the manual is the PMCS checks. He must be aware that a form exists to facilitate the transfer of information derived from the PMCS; that this form is the DA Form 2404.

Further, he must know that the form must be given to a mechanic if he, the operator, cannot correct all of the faults noted. Finally, the operator must understand that his job is not finished until all of the shortcomings are corrected; he cannot consider his responsibilities fulfilled until the vehicle is operational without fault.

The ***mechanic*** must diagnose what is wrong with the vehicle once the operator has identified a fault. He must know the operator's responsibilities as well as his own. He must be able to know what is available to him to aid in his diagnosis and how to use the manuals, test equipment, and measuring devices that can correctly pinpoint what is wrong.

Once the mechanic has diagnosed the cause of the fault, he must be able to determine what parts and tools are needed to fix it. He must further determine if it is within his capability to accomplish the repairs. He must know how to pass on the information as to parts he requires to the PLL clerk and must be able to give the PLL clerk all the necessary elements of information for him to expeditiously requisition them.

The ***first-line supervisor*** has the most important responsibility in the preventive maintenance cycle. It is his responsibility to oversee the operator and to deal with the motor sergeant. Because operators change from time to time, it is the first-line supervisor who provides continuity and oversight and training to the operator that is assigned. He must keep track of several vehicles and is in a position to see if systemic problems are preventing proper maintenance from occurring.

What is the ***officer's*** role in maintenance and management? Whether the platoon leader, executive officer, or commander and regardless of echelon, the officer must be a facilitator of information exchange and marshal of resources. He ensures that information passes efficiently among the players and that they know what to do with the information once they get it; and he must provide the necessary resources of time, personnel, and equipment to accomplish the necessary repairs. If this synchronization occurs, success is assured.

There are some successful painters who are not artists. They paint by copying parts of various images into a larger composition that becomes original by its choice of images. By reducing the function of painting into a composite set of brush strokes and color selection, they create complex works that considered as a whole might be beyond them.

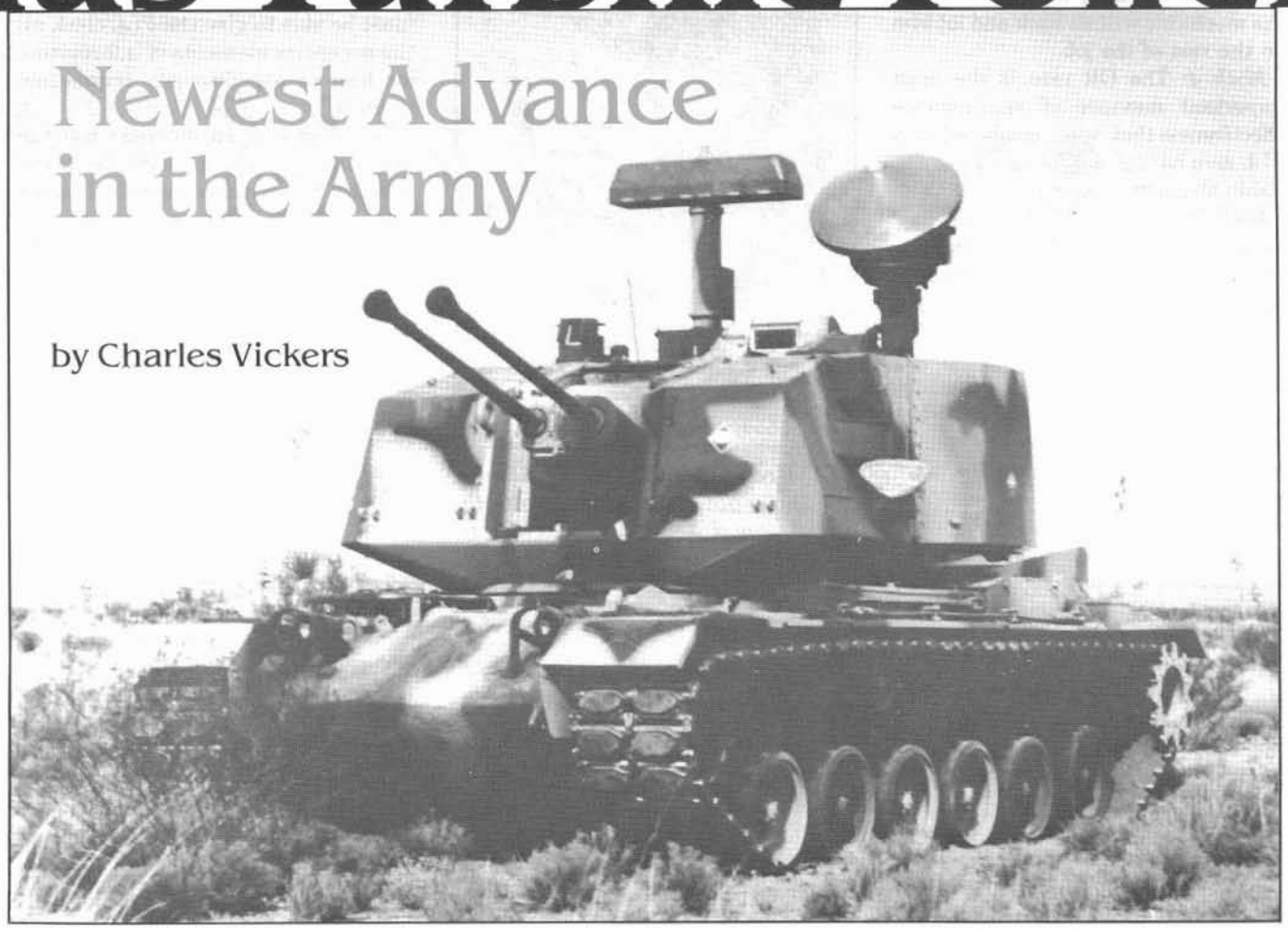
Good maintenance management does the same thing. It takes a complex situation and defines the roles and functions of each element within the picture. Through identification and definition of these roles, an effective maintenance management program can be developed much in the way the non-artist produces a painting.

LTC Roger C. Strom is the Director of the Department of Military Logistics at the U.S. Army Engineer School. He has commanded a combat heavy Engineer battalion. LTC Strom has a master's degree in logistics management from Ohio State and is a graduate of AFSC.

Gas Turbine Power

Newest Advance in the Army

by Charles Vickers



The prime power unit of the DIVAD will soon become a maintenance duty of the 52F MOS. The air defense gun system is officially named "SGT York" in honor of SGT Alvin C. York, the WWI infantryman who received the Medal of Honor for his actions during the Meuse-Argonne battle of 1918. DIVAD is the first major Army weapon system named for an enlisted soldier (photo courtesy of Ford Aerospace).

Many of the newest advances in the Army's Electrical Power Equipment Development Program feature gas turbine engine driven equipment. In addition to use in missile systems, the turbine engine driven generator set has many other applications to meet the demands of today's military environment.

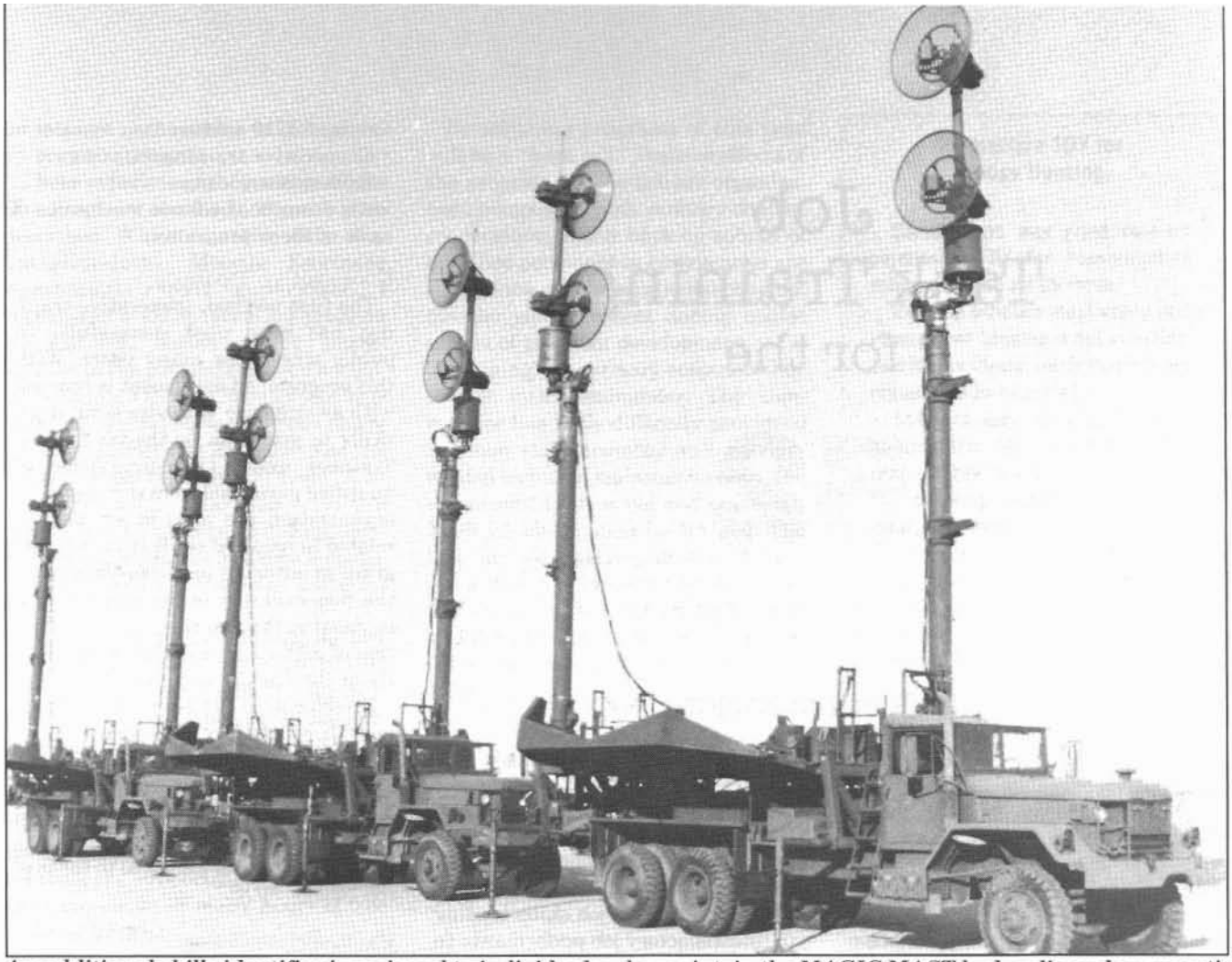
The extent of the many new systems in the program created a new MOS on Oct. 1, 1983 when the Army approved a split from the 52C MOS. As a result, all turbine engine driven equipment and Antenna Mast Group maintenance would now be performed by the 52F MOS—Turbine Engine Driven Generator Repairer.

The duties of this new MOS were defined in AR 611-201, Change 20, as performing or supervising organizational, direct, and general support maintenance functions of turbine engine driven generator sets and prime movers. When the split of MOSs occurred, a program of instruction (POI) for 52F10 was developed and in May 1983 approved by the commander of TRADOC. Based on a 36-hour instruction week, this course was to be slightly longer than 11 weeks.

The AIT students' need for basic skills and knowledge, in addition to the technical training on turbine equipment, resulted in the development of a basic electricity block of training which would introduce the students to electrical schematics and the proper use of electrical test equipment. This 60-hour block was developed by the instructors assigned to the 52F Branch in the Department of Military Logistics at the Engineer School. An annex of maintenance management was also developed and included in the POI. Its purpose was to teach the students to use technical manuals and to prepare maintenance forms and records.

This new course, the Turbine Engine Driven Generator Repairer Course, initially included an annex on the Pershing 1A Missile Power Station. This annex was deleted from the POI in December 1984 when Pershing 2 was fielded and training requirements for a turbine engine power station were no longer required. At the present time, the Turbine Engine Driven Generator Repairer Course includes annexes on the Medical Unit, Self-Contained Transportable (MUST) Utility Pack and Patriot Missile Peculiar Equipment which includes an Antenna Mast Group.

The Patriot Mast System, used in support of the Patriot System, is



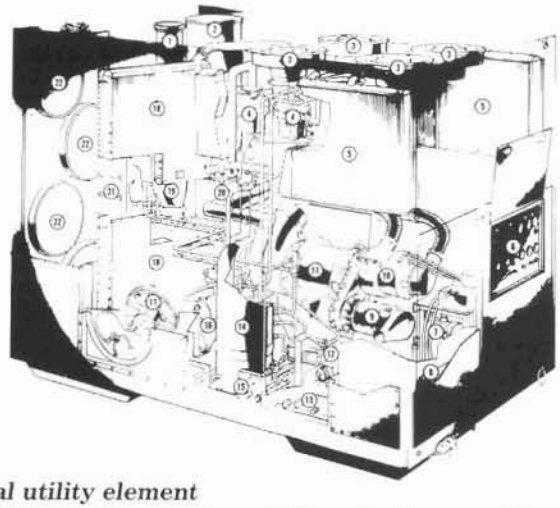
An additional skills identifier is assigned to individuals who maintain the MAGIC MAST hydraulic and pneumatic systems. Although this equipment has no turbine engine, maintenance is assigned to the 52F MOS (photo courtesy of GTE).

pneumatically and hydraulically operated. It has no turbine engine, but maintenance of this equipment was assigned to the 52F MOS. A 100-hour block of instruction on the Antenna Mast Group was developed by 52F Branch instructors. This block will be added to the POI given to all MOS 52F personnel in AIT who have received orders for follow-on assignments to Fort Bliss, TX, and USAREUR units through FY 85. An additional skill identifier, C-9, will be assigned to individuals going to units authorized Antenna Mast Groups.

The Turbine Engine Repairer will soon be maintaining two of the newest items in the Army's inventory of turbine engines and generator sets. First, the DIVAD Gun System or SGT York, with a turbine engine as the prime power unit, has gone into production. AIT student training should begin in the 4th quarter of FY 85. Also, the Aviation Ground Power Support Unit will soon be added to the 52F MOS training. This 10 KW, 28 VDC generator set will be used for aircraft starting, checkout, and maintenance.

The fast growing family of gas turbine engine driven equipment has made this new 52F MOS attractive and one of the most sought after career fields in the today's modern Army.

Mr. Charles Vickers is Chief of the 52F Branch, Department of Military Logistics, U.S. Army Engineer School. He has served as a training instructor in the Pershing Missile Equipment and MUST Hospital Training Sections. He has been with the Engineer School since 1968. Mr. Vickers is a veteran of 21 years in Marine Corps Aviation.



The MUST field hospital utility element is a 52F responsibility (illustration courtesy of Garrett-Airesearch).

Job Task Training for the 52 Charlie

by Richard Kilgore

The unit commander in today's Army is tasked with providing training to maintain the overall job proficiency of soldiers in a variety of technical fields. The commander's unit training programs usually do a good job in the common task area and a fair job in training for those technical tasks that relate to the unit's mission. Training on other technical MOS tasks all too often is either disregarded or leaves much to be desired. Because of a lack of equipment, tools, and subject matter experts, this training is usually difficult to formulate and deliver at the unit level.

The Skill Level 1 Utilities Equipment Repairer (MOS 52C10) is typical of an MOS with this problem. The soldier with this specialty is tasked with a broad range of responsibilities in the maintenance of utilities type equipment used by the Army. His duties vary from operation/maintenance of the Bottle Cleaning and Charging Station (BC/CS, AN/TAM-4) to performance of direct and general support maintenance on air conditioning and refrigeration equipment.

It is rare for a soldier in the 52C10 MOS to be assigned to a position that provides experiences in all of the skill areas. Interviews with utility equipment repairers returning from the field to attend the Utility Equipment Repairer Primary Technical Course (662-52C20) indicated that some soldiers have never practiced their trade and that the majority have been limited to work experiences in only a portion of their overall job responsibilities. At least two problems created by this situation are readily evident:

- Erosion of unused job skills leading to unsatisfactory job performance in future assignments.
- Poor performance on the Skill Qualification Test (SQT).

It is the commander's responsibility to provide training that will sustain and upgrade the soldiers' technical skills, but what can he do if unit resources prevent him from providing that training?

First, the commander should review the training publications (soldier's manual, training guide, and job book) and determine which tasks are actually being performed by his 52C10 soldiers and which are included in his unit training plan for the soldier. From this action the commander can develop a list of tasks that require training. He then should determine if he has the required assets to conduct any of this training within the unit. If so, the training should be incorporated into his unit training plan.

In those situations when a lack of equipment or an absence of subject matter experts precludes unit level training of a particular task, the commander should explore the possibility of providing this training through outside sources. Two possible approaches can provide additional skills training for the 52C10 soldier:

- Cooperative training.
- Exchange training.

Let's examine the basic mechanics of each of these programs.

Cooperative Training

The first method, cooperative training, has been used successfully in public schools for many years. With this program, an agreement is reached with an employer who uses similar job skills to act as an on-the-job trainer. Trainees under the supervision of qualified personnel from the employer organization are used in job actions related to required skills training. Program monitoring and coordination is the responsibility of the organization requesting the training, while evaluation of performance is the responsibility of the trainer organization.

Directorate of Industrial Operations and Directorate of Engineering and Housing are recommended as employers for this action because they are normally involved in a wide variety of utility equipment maintenance tasks that are similar or identical to tasks of the 52C10 MOS.

Exchange Training

The second method, exchange training, involves the actual exchange of soldiers between Army units that have dissimilar missions, equipment assets, and subject matter expertise. This approach to training is especially relevant when training involves operation/maintenance tasks on equipment such as the Bottle Cleaning and Charging Station or the Power Plant, Utility, MUST. To establish this type of program, the commander should screen units in the same geographical area to determine asset availability and then work out an exchange agreement with the other commander.

Regardless of the method of training, command initiative is required. To ensure that training objectives are met and that the program is beneficial from a manpower/production standpoint, agreement for training programs of these types must be carefully developed. Written guidelines, which both parties agree to, should include provisions for the maintenance of training records required by the soldier training publications. Length of training periods will have to be flexible to ensure the required training is provided without causing an adverse effect

on mission performance of the involved organizations.

I have experienced the positive effects of a program similar to those I have described. While on active duty as a battalion-level, Missile Engineer equipment repair supervisor, I recognized a skills-retention problem for the 62C series soldier (duties similar to the 52C today) when assigned within CONUS. To alleviate this problem, an oral agreement was reached with the Facility Engineer and the DS/GS support unit to team 62C soldiers with qualified civilian mechanics to perform all Engineer-related maintenance and repair operations performed at the firing batteries of the battalion.

Within a year of establishing the program, the 62Cs under my supervision had assumed responsibility for performance of over 50 percent of support-category site maintenance and had been provided work experience and training that sustained and upgraded their MOS job skills. In addition to the training benefits provided to the 62C soldiers, the supporting organizations were recipients of many hours of free maintenance.

Establishing programs of this type will be a "hard sell." Positive effects of the program for the trainer organization, manpower gains, military-civilian cooperation, and a back-up source of qualified personnel in emergencies are a few of the selling points that the commander could present during initial stages of program development.

Training is a primary responsibility of the unit commander. The commander has little difficulty providing common skills training and mission-related technical training; however, the responsibility does not end there. All MOS job skills must be trained. The training alternatives described here are a means to improved training and proficiency in the 52C10 MOS field, and the potential exists for adoption of these alternatives to other technical MOS categories.

Mr. Richard Kilgore is a training instructor in the 52C Branch, Department of Military Logistics, U.S. Army Engineer School. After serving 21 years in the military, he retired as an Engineer Maintenance NCO.

Permissive TDY for House Hunting

Commanders may grant soldiers permissive TDY for house-hunting connected with a PCS move.

Housing officials must verify that government housing is not available, or if it is available, verify that it is not required to be occupied.

Soldiers may take one house-hunting trip for each set of PCS orders. They may be granted one of the following options:

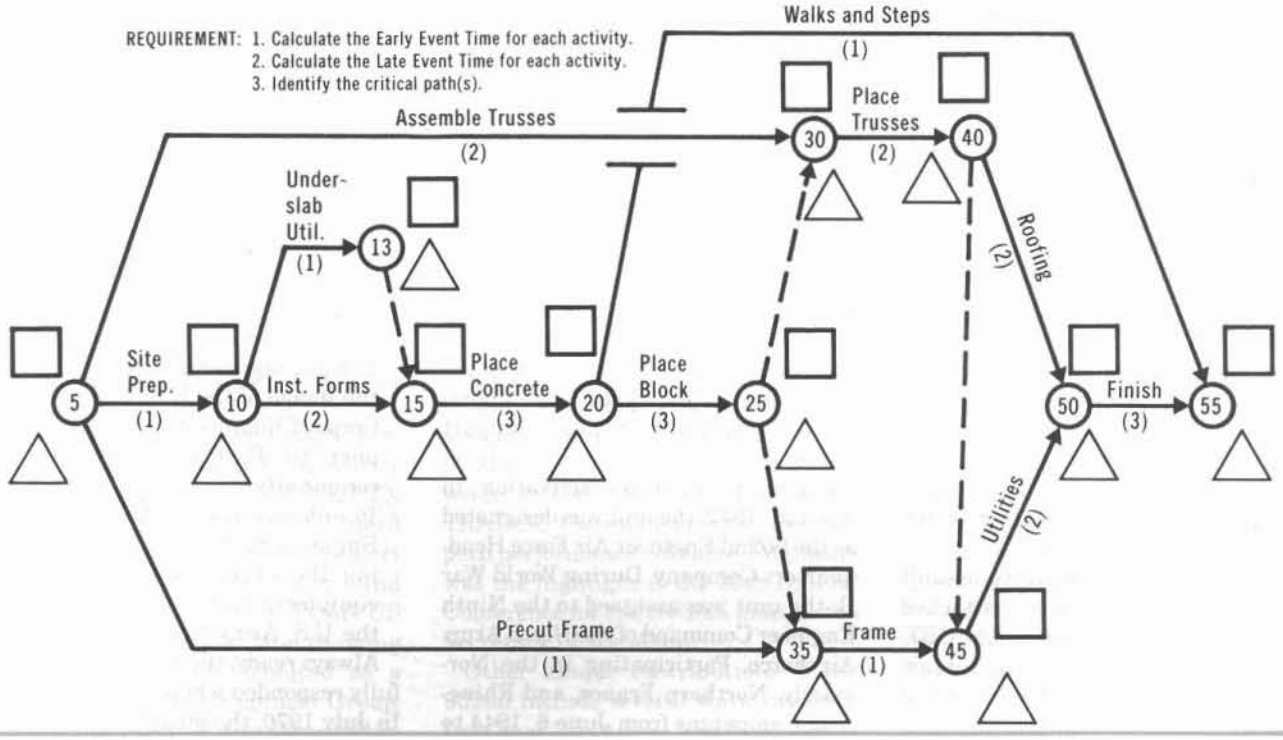
- Up to seven days of permissive TDY after they receive notification of PCS orders, but before the scheduled departure from the losing duty station.
- Up to five days of permissive TDY in conjunction with PCS travel and leave.
- Up to five days of permissive TDY at the new duty station.

The soldier should contact the housing officials at the gaining installation, following the procedures in Chapter 12 of AR 630-5, "Leaves and Passes."

Engineer Problem

It is clearly understood that the Critical Path Method (CPM) is a very useful management tool when used in the right perspective.

REQUIREMENT: 1. Calculate the Early Event Time for each activity.
2. Calculate the Late Event Time for each activity.
3. Identify the critical path(s).



THE DEUCE

by CPT Kevin Brice

A joint effort by the 902nd and the 1438th Engineer Company (Missouri National Guard) constructed this 44-bay ribbon bridge across the Arkansas River (photo by CPT Kevin Brice).

Operation Pontonier, the dynamic, fast-paced demonstration of Army bridging and rafting capabilities, is one of many events sponsored by Fort Belvoir and the Engineer School that exhibit Engineer equipment to foreign dignitaries, VIPs, Engineer officers, and the surrounding military and civilian community. The responsibility for this and many other show-case demonstrations is the mission of the 902nd Engineer Company.

The "Deuce" is a separate assault float bridge company that is attached to the 11th Engineer Battalion (CBT) (HVY). It is a unit with a unique organization, proud history, and multifaceted mission.

What's on the schedule for classes this week?

On Tuesday we have a soils exam; Thursday, a concrete P.E.; and on Friday afternoon, we have something called "Operation Pontonier."

What's "Operation Pontonier?"

I'm not sure but I think it's some sort of bridging demonstration. I've heard it's pretty good though!

The 902nd is more than a ribbon bridge company. In fact, every type of military bridge in the active Army inventory is assigned to the Deuce through the attachment of the SPED (Special Purpose Equipment Detachment). This TRADOC element has everything from the Mobile Assault Bridge (MAB) and the Medium Girder Bridge (MGB) to the Combat Engineer Vehicle (CEV) and the Armored Vehicle Launched Bridge (AVLB). Augmented with the SPED, the 902nd has an authorized strength of 212 personnel and more than $40 million in equipment. This organization makes the Deuce uniquely equipped for its unparalleled Engineer School support mission.

Beginning with its activation in April 21, 1942, the unit was designated as the 902nd Engineer Air Force Headquarters Company. During World War II, the unit was assigned to the Ninth Engineer Command of the Ninth Army Air Force. Participating in the Normandy, Northern France, and Rhineland Campaigns from June 6, 1944 to March 21, 1945, the 902nd built 301 airfields in France, Belgium, Holland, Luxembourg, Austria, and Germany.

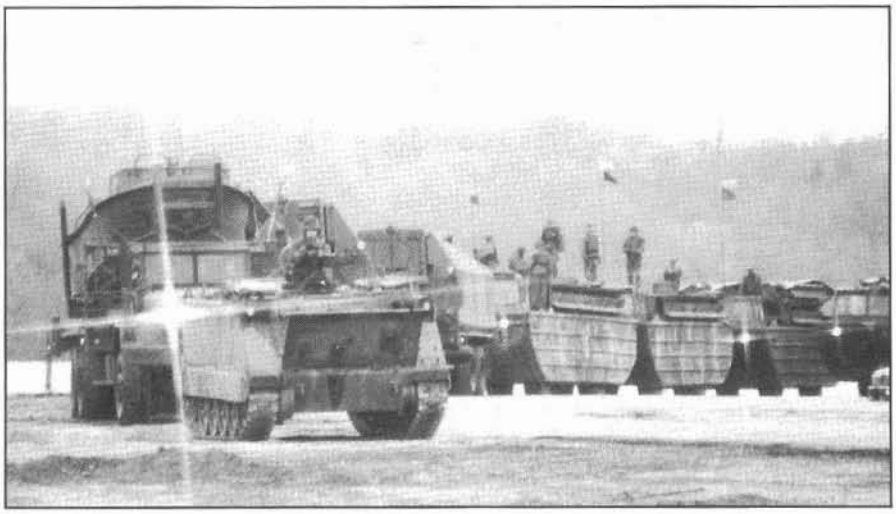
For its service during World War II, the 902nd Engineer Air Force Headquarters Company was awarded the Meritorious Unit Commendation for exceptionally meritorious conduct from April 1, 1944 through May 8, 1945. Today, the 902nd maintains a tie to the past by proudly wearing the distinctive unit crest which symbolizes its history. The horizontal perforated steel planking and blue coloring represent the unit's ties with the Army Air Corps as airfield builders. The vertical shovel and red coloring show the unit is a member of the Corps of Engineers with the motto, "We Will Conquer."

In 1947 the unit was inactivated, and on May 26, 1967, it was reactivated at Fort Belvoir and redesignated as the 902nd Engineer Company (Float Bridge).

Since its designation as a float bridge company, the Deuce has had a threefold mission.

- To be poised for immediate tactical deployment world-wide to provide combat mobility for U.S. and Allied forces on the battlefield.
- To make significant contributions to the image of the U.S. Army and the Corps of Engineers by providing support to Fort Belvoir and the community.
- To enhance the combat training of Engineer School students by providing the expertise, manpower, and equipment for all bridge training at the U.S. Army Engineer School.

Always ready, the 902nd has successfully responded whenever called upon. In July 1970, the 902nd was alerted to



Operators and equipment from the 902nd prepare to demonstrate the Army's river-crossing capability. The Deuce is unique in that it maintains every type of military bridging equipment in the active Army inventory (staff photo).

provide two 180-foot M4T6 bridges at Great Bridge, VA. The bridges were constructed and maintained for civilian use across the Albemarle and Chesapeake Canal. Over 170,000 vehicles crossed these bridges without mishap; and daily for 38 days, the center sections of both bridges were removed to allow water traffic to pass through the canal.

In the aftermath of Hurricane Agnes in June 1972, the 902nd performed emergency rescue and rafting operations in Fairfax, Alexandria, and Occoquan VA; in Pittston, Laceyville and Lancaster, PA; and in Ellicot City, MD. The 902nd also provided emergency bridging at Hilton Head, SC, in March 1974 and at Siloam, NC, in June 1975.

In January 1983, when an Air Florida Airlines jet plunged into the frozen Potomac River, the 902nd provided an emergency floating platform to facilitate rescue operations. Most recently, the Deuce constructed a Bailey Bridge across Dogue Creek near the Walker Gate entrance of Fort Belvoir to allow repair of the existing bridge.

Last July, the Deuce deployed to Fort Chaffee, AR, to participate in Scarlet Sabre II. This major CAPSTONE FTX with the Missouri National Guard allowed the 902nd to practice its alert procedures, POM processing, and deployment to simulated POMCUS sites near Fort Chaffee. After drawing equipment, the unit deployed as a member of the 135th Engineer Group. During the exercise the Deuce combined its forces with the 1438th Ribbon Bridge Company to provide for three deliberate river crossings of the Arkansas River. The success of this exercise graphically demonstrated that the Deuce is capable of performing its world-wide deployment mission.

At Fort Belvoir, the most well known of the 902nd's demonstrations is Operation Pontonier. Last year special pontoniers were given for the civilian aides to the Secretary of the Army, a group of officers from the Mexican Army, and for the annual Fort Belvoir's Retiree Open House.

The Operation Pontonier "float-by" presentation demonstrates the phases of a deliberate river crossing while displaying the Engineer equipment used during each phase. The use of helicopters from the Military District of Washington and the Pennsylvania National Guard and demolitions and pyrotechnics create a realistic look at U.S. river-crossing capabilities.

Although the equipment and special effects are highlighted, the professional performance of the men in the Deuce is what makes Operation Pontonier possible. Last year the Honorable John O. Marsh, Jr., Secretary of the Army, wrote to GEN William Richardson, TRADOC Commander, that the "superb performance" of these Engineers was the highlight of the 30th Annual Conference for the civilian aides to the Secretary of the Army.

Other unique contributions of the 902nd include several static displays. Last year equipment was displayed at Andrews Air Force Base for the Armed Forces Day Celebration, at the Fairfax County Fair, and at the Fort Belvoir's Annual Retiree Open House. In these displays the bulk of the equipment supplied by Fort Belvoir comes from the 902nd and the SPED. The 902nd plans to display equipment again this year at the Armed Forces Day Celebration and the Fairfax County Fair.

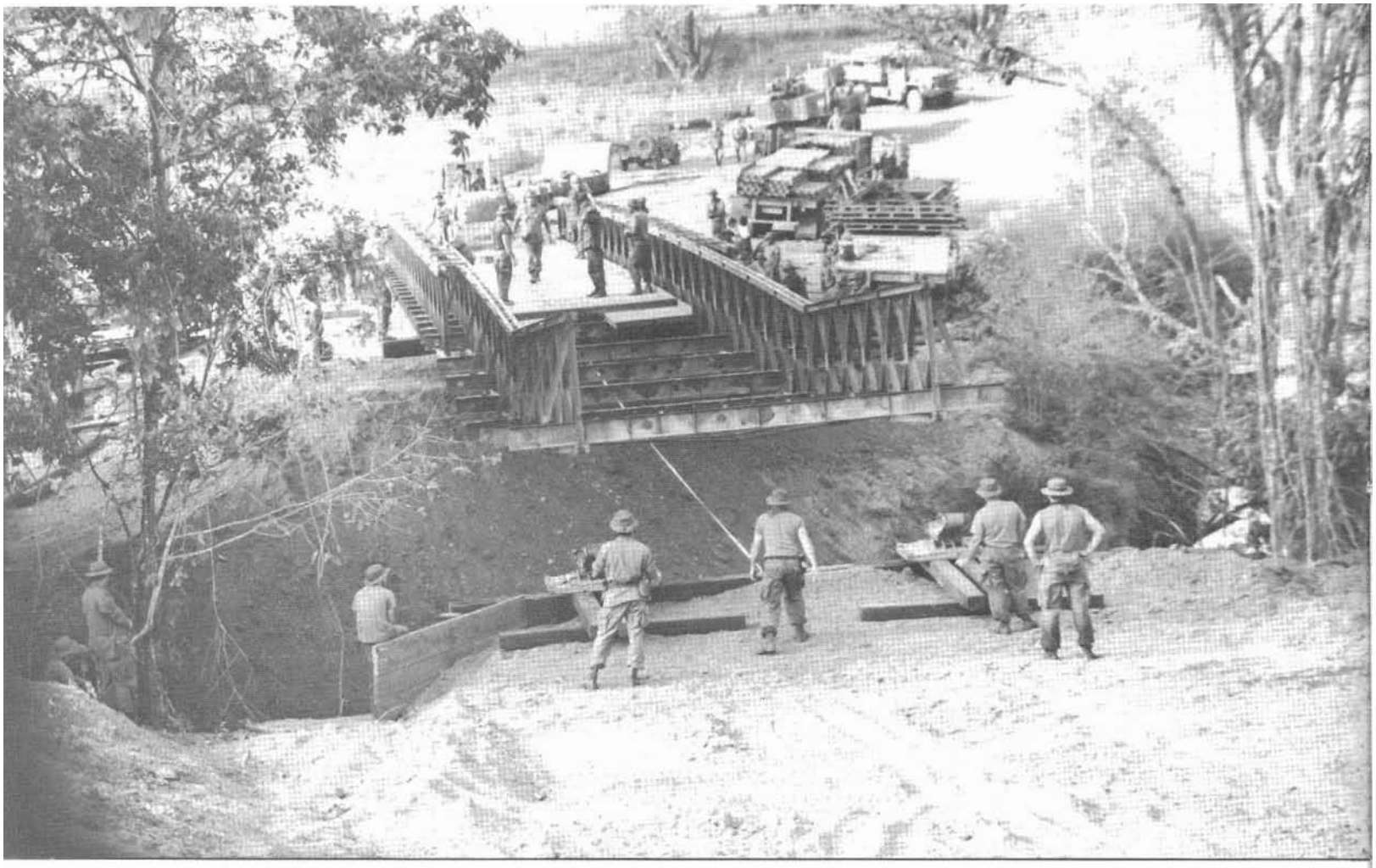
The 902nd Engineer Company's primary mission is to support the training at the Engineer School:

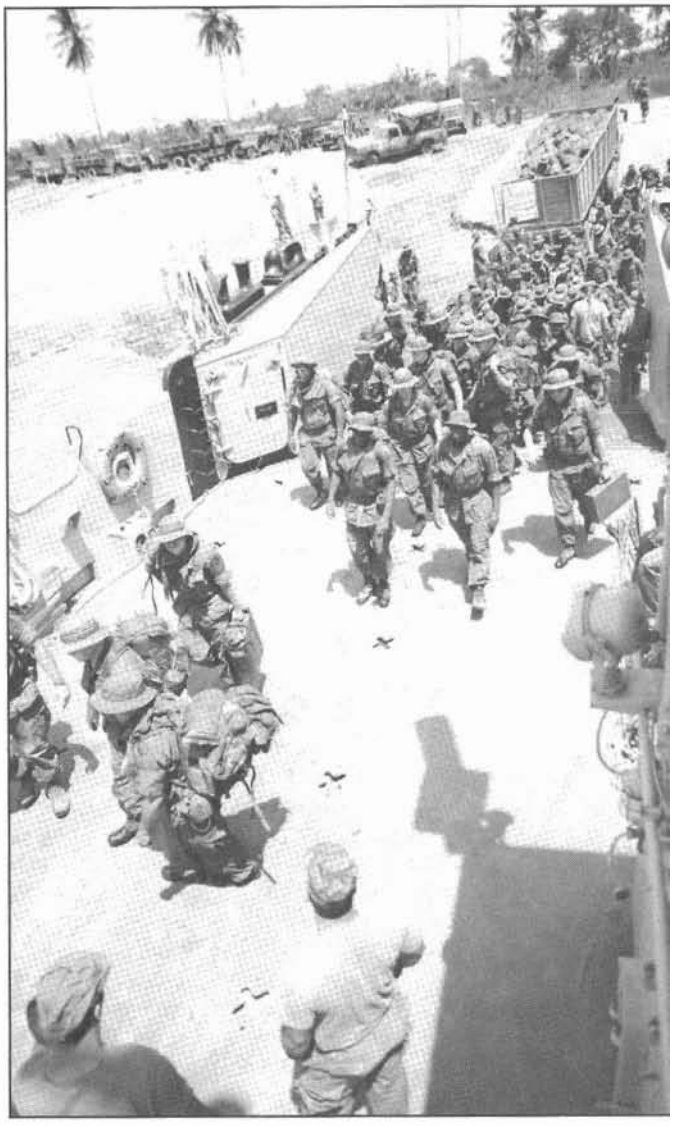
- This includes more than 16,500 manhours each year in support of Engineer School "white sheets." (White sheets list the support requirements needed by the School.)
- Training on the Ribbon Bridge, the Mobile Assault Bridge (MAB), the Light Tactical Raft (LTR), the M4T6 Fixed and Float Bridges, the Medium Girder Bridge (MGB), and the Bailey Bridge is all provided with 902nd assets.
- All Engineer Officer Advanced and Basic Course students, all Engineer NCO Advanced Course students, and all 12C Bridgeman's Primary Technical Course students receive training provided by the Deuce.

The training support mission of the 902nd goes far beyond the main gate of Fort Belvoir. Every summer a large contingency of the 902nd travels 600 miles north to the United States Military Academy at West Point to assist with cadet summer training. Last summer, the SPED supported this high-visibility training while the rest of the company was at Fort Chaffee. This year, 2nd platoon will provide the support.

Throughout the year, the 902nd Engineer Company provides continuous, professional support to the Engineer School at Fort Belvoir, the Center for Excellence.

CPT Kevin Brice commands the 902nd Company, 11th Engineer Battalion (CBT)(HVY). He was an instructor in the Bridging Branch, DME, at the Engineer School and served as platoon leader, company executive officer, and the adjutant of the 317th Engineer Battalion in Germany. CPT Brice has a bachelor's degree in civil engineering from the University of Wisconsin and has completed the Engineer Officer Advanced Course. He is a registered professional engineer in Wisconsin.





Blazing Trails Thru Panama

Photo essay by CPT Daniel B. Miles Jr.

Missouri and Louisiana National Guard Engineers cleared and surfaced 27 kilometers of roadway during Blazing Trails. Over 9,500 soldiers from eight states participated in the Combat Engineer exercise.

I want to share with you some information I received and lessons I learned while serving in MILPERCEN. Much of what I say here is not controlled at Engineer Branch level; but it is reality, and I sincerely want all of you to understand *the rules* as they are being applied.

We tell all EOBC students to first plan on being soldiers, troop leaders that is, and not be concerned about working in the civil engineering arena yet. The Corps of Engineers exists to provide support to the Combined Arms Team on the battlefield. The essence of being a combat arms officer is leadership; this must be learned and practiced as a lieutenant. *Don't* plan on working in your undergraduate civilian major field; *do* plan on getting dirty, greasy, muddy, and professionally satisfied while leading our combat soldiers during your early assignments.

Branch Qualification

The term, "branch qualification," identifies those officers who have met certain minimum qualifications:

- Initial troop-leading experience.
- Resident EOAC (completing EOAC only by the nonresident method requires Branch approval).
- Company command.

Once officers are branch qualified, they may be selected for assignments such as ROTC instructor duty, recruiting company command, reserve advisor duty, U.S. Army Corps of Engineers (USACE) civil/military construction positions, instructor duty at the Engineer School or at another branch's school, attendance at advanced civil schooling (ACS), or command of a separate company.

Most of our Engineer officers become branch qualified after commanding a company during their second troop tour (following EOAC). However, some officers do command during their initial troop assignment and become branch qualified upon graduation from EOAC. While Engineer Branch recommends that all officers go to a second troop-type assignment after EOAC—to broaden their perspective of the Army and to give them a better professional development base for a long career in the Corps of Engineers—Army requirements do not always permit us to do that.

Can you apply for ACS if you are branch qualified after EOAC?

Yes.

Might Engineer Branch send you to one of the assignments mentioned previously if you are branch qualified after EOAC?

It is quite possible; however, we would prefer to send you to a second troop assignment.

When one becomes branch qualified is not as critical as *how* one becomes branch qualified. Your performance as a troop-leading lieutenant and as a company commander is extremely important to having a viable Army career ahead of you.

Upward Mobility

All promotion rates used here are for "first-time-considered" officers.

- Promotion rate to **captain** is 92 percent. Most lieutenants will get promoted unless they have some major deficiencies in their performance record.
- Promotion rate to **major** is 80 percent. Some captains who are fully qualified for promotion will not be selected. To be selected, you must have commanded a company and performed all of your jobs exceedingly well. Your company command reports are critical in making this promotion selection.
- Promotion rate to **lieutenant colonel** is 70 percent. You *must* be a Command and Staff College (CSC) graduate (Military Education Level 4—commonly referred to as MEL 4). It does *not* matter if you attended in residence or if you took Command and General Staff College (CGSC) by the nonresident method.

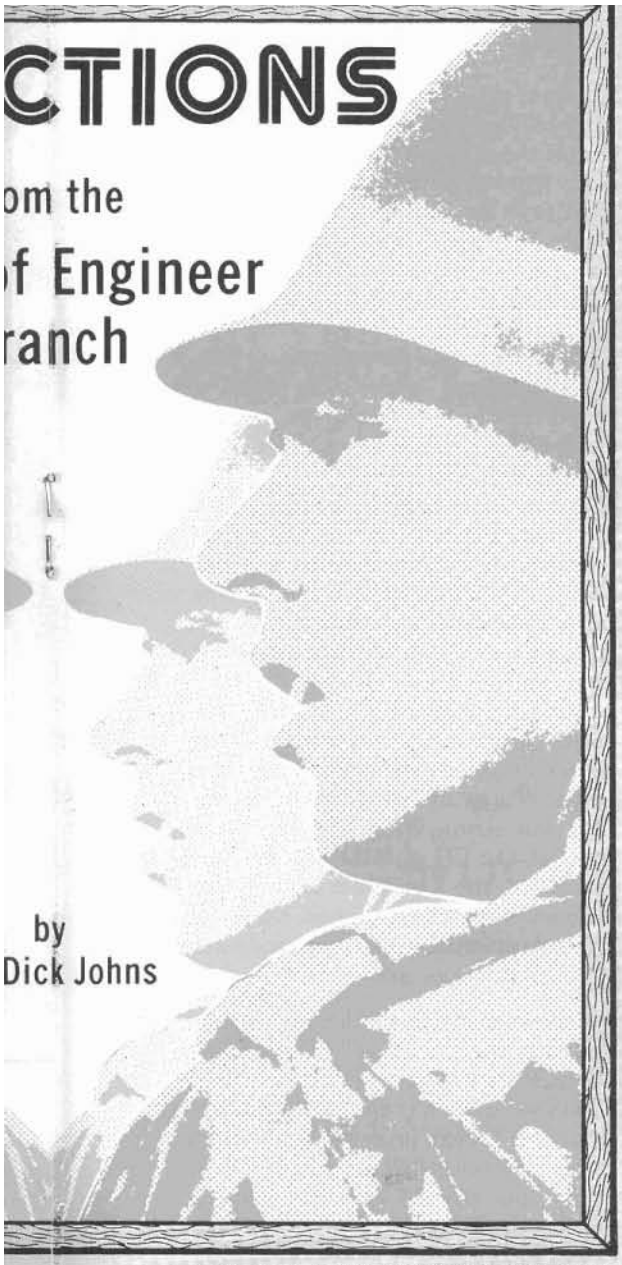
Each officer will be considered four times for selection to resident CSC. If you are not selected by the second consideration, you should start one of the CGSC nonresident courses immediately. Don't wait until the last minute as many officers have unfortunately done.

If you complete CGSC by the nonresident method and then get selected for the resident course, this simply expands your options. You can request attendance at one of the sister schools (or CGSC), or you can waive attendance. Waiving attendance at resident CSC is not normally recommended, but it is an option. A letter is placed on your performance microfiche stating you were selected for resident CSC and waived attendance because you had completed the nonresident course.

In addition to being a MEL 4, selection for lieutenant colonel requires that your performance must have been outstanding, not just adequate, in nearly every job you have done.

Selection for lieutenant colonel command is highly competitive. Only 20 to 25 percent of the Engineer lieutenant colonels will be selected for command. In any one year, between 6 and 10 percent of those eligible get selected. Your best chances for selection are during your second and third years of eligibility. The probability of being selected for lieutenant colonel command without serving in a troop unit as a major is very slim—not impossible, but slim. On the FY 85 Command List, 5 out of 50 Engineer selectees were in this category; on the FY 86 Command List, 1 out of 30 Engineer selectees had not served with troops as a major.

One third of the FY 86 Command List were nonresident MEL 4, which supports my statement that it is not important how you obtain your CSC education. This tells me that these officers' early files may not have been as strong as those of some of their contemporaries; however, they continued to



perform in an outstanding manner and are now on the fast track to colonel!

The selection rate for colonel is 50 percent of those eligible. More revealing, though, are these statistics:

- Of all Engineer lieutenant colonels selected for colonel, 75 percent have had a successful battalion command experience.
- Of those with battalion command experience, 96 percent get selected for promotion.
- The 25 percent selected for promotion without battalion command usually have had similarly challenging assignments of singular responsibility, such as DEH, recruiting battalion command, or DA staff.

Currently, the time in grade spent before promotion (not selection, but actual promotion) is approximately:

CPT to MAJ	7 years
MAJ to LTC	6 years
LTC to COL	6 years

Career Goals

Success, as reflected by career goals, must be tempered by the realities of today's Army. A realistic career goal today is the expectation of being promoted to lieutenant colonel. While this may be different from the situation 10 years ago, it certainly reflects what is happening now. The promotion system necessarily causes officers to be non-selects. That does not mean they are not solid performers; in fact, most of the officers that have not been selected for promotion are doing outstanding work. Unfortunately, as we ascend in rank, the probability of non-selection increases.

Objectively analyzing your performance and establishing realistic career goals is a trying experience. I urge you to consult others (perhaps your commander, maybe peers, and certainly your assignment officer at Branch) for advice, guidance, and ideas.

Advance Civil Schooling

Each year, Engineer Branch sends officers to Advanced Civil Schooling (ACS) for master's degrees (usually in engineering and related fields). Selection is made by a board conducted by Engineer Branch and is based primarily on potential for future service as demonstrated by manner of performance.

This ACS board meets in September and March of each fiscal year. Your application is good *only* for the fiscal year in which you apply. If you are not selected by the September Board, you will automatically be reconsidered in March.

Your time in service and time in grade as a captain, coupled with your own realistic goals, should indicate whether or not you should apply for ACS. Army policy dictates that ACS must always be followed by a required utilization tour of three consecutive years. Very, very few of these utilization tours are with Engineer troops.

Spending from one to two years in ACS followed by a three-year utilization tour, plus possibly one year in CSC, could add up to six years away from soldiers. If this six-year period coincides with your years as a major, you have substantially reduced the probability of being selected for lieutenant colonel command.

Is going to ACS followed by a three-year district tour or a teaching assignment at West Point a good idea?

Yes, of course it is!

Can it be a bad idea or hinder your career?

Yes, depending on what your career goals are and where you are with respect to time in service and time in grade.

Unfortunately, many officers do not realize this until it is too late. Engineer Branch has absolutely nothing to do with the three-year utilization policy; this is required by law.

Let's say you have completed your three-year ACS utilization assignment and are coming out of CSC with one, two, or three years left as a major. Because of the stabilization criteria under which we operate, Engineer Branch has only one opportunity (PCS move) to get you to an installation or MACOM where troops are located. We do not and cannot assign you to a particular unit; that is the installation commander's prerogative.

The major's assignment office will do all he can to get you to a place where troops are located if that is your desire. However, he must satisfy a MEL 4 distribution plan that requires "X" number of CSC graduates go to certain MACOMs. Very few of these requirements may be with Engineer soldiers. On the other hand, if you are able to get a master's degree during your off duty time or while in a permissive TDY status of less than six months, you will not owe the Army a three-year utilization tour and you will have all six years (at least two assignment locations) as a major to try to get with Engineer troops.

Is having a master's degree required to get selected for lieutenant colonel?

No, absolutely not! It does open up additional assignment possibilities, but it doesn't even come close to the importance of being a CSC graduate.

Lieutenant colonel and lieutenant colonel command seem a long way off when you are a relatively young captain, but this is when you must plan for your future. Draw yourself a time line and plot out where you are and where you would like to go. Your assignment officer will be happy to discuss it with you.

Lean and Mean

AR 600-9! Army policy is very clear about not being overweight. Do everything humanly possible to get within the screening table height and weight limits and do not rely on the pinch test. Certainly, though, some body builders

and weight lifters must rely on the pinch test; in such cases, your rater must make a comment concerning your height and weight in Part IV b. of your OER. Ensure that he does!

My recommendation remains . . . *get within the table standards!* If you are overweight or fail the PT test, you will not be selected for promotion/schooling regardless of your manner of performance.

Photograph

The hard-copy photograph is absolutely essential to your file. The importance of your photograph cannot be overemphasized. (Some would argue that it has become too important—I will not address that issue here, but you must understand that the photograph is critical.) Its use spans the entire spectrum of personnel actions: promotion boards; school boards; nominations for ROTC, USAREC, and IG positions; and nominations for special high-level positions within DA, DoD, JCS, and the federal government. In almost any selection/nomination action, the first items examined in officers' files are their photographs.

Your photograph should show you as a neat, well groomed soldier . . . no wrinkles in your uniform, no "high water" trousers, correct brass (not GS or IG), and only authorized awards and decorations. I recommend no mustache.

Although the AR requires a photo only every four years, I suggest you get a new photo upon promotion and ensure that before a scheduled board, the photo in your file is not more than one year old. The more current the better because you are showing the board members how you look now and that you are proud of it instead of showing them how you looked four years ago.

The photo must reinforce the height and weight data on your IRB (Individual Record Brief—formerly known as the ORB, Officer Record Brief) and your latest OERs. (If these items do not agree, you are asking for trouble.)

Individual Record Brief

The IRB represents a single page summation of your career and background. Before any field grade promotion board, your local Military Personnel Office (MILPO) will ask you to conduct an IRB audit and sign a promotion board IRB verifying that everything is true and accurate. Carefully review all the IRB entries and correct any errors neatly—that is what the signed IRB system is for! Most critical is your height and weight data, military education level, and your assignment history. Your MILPO will forward this *signed* and *validated* IRB to MILPERCEN for inclusion in your file which goes before the board.

Your assignment officer will do all he can to ensure your file is accurate and complete, but he is obviously concerned about many officers. The ultimate responsibility rests with you; you have only one officer to be concerned about.

Truth and/or Consequences

It is important that you realize that Army requirements still "drive the train." While your assignment officer sincerely wants to accommodate everyone's preferences, it is virtually impossible. We are all professional soldiers and must periodically "lean forward in the foxhole" to meet the needs of the Army. Believe me, your assignment officer does not enjoy sending you to a job or location that you do not want!

I have presented some of my ideas and philosophy as well as some facts about promotion and selection. Hopefully this will provide food for thought and food for planning. The specific types of jobs and schools required for certain selections are few (company command for promotion to major, CSC for lieutenant colonel, and service with troops as a major for selection to lieutenant colonel command). What is important is that you do everything well. I believe a better way to say this is, BE ALL YOU CAN BE.

We also need to have fun at what we do. I hope you enjoy the challenges and opportunities afforded an Army officer. If you never like what you are doing and never have any fun, maybe you should re-evaluate why you are where you are.

Most have heard the phrase, "the truth changes," usually when talking about our personnel system. I don't like the phrase at all, but it does reflect our dynamic Army. When the director of OPMD, the CG of MILPERCEN, the DCSPER, the Vice Chief or the Chief of Staff of the Army change, Engineer Branch priorities may change.

I have written about the way we have been doing business in Engineer Branch for the past year or so. Can I promise it won't change? Unfortunately not. I can promise you that the folks at Branch *will* tell you the facts. They honestly do care for soldiers. ESSAYONS!

LTC Dick Johns is an ROTC graduate of California State Polytechnic University at San Luis Obispo where he earned a bachelor's degree in electronic engineering. He also holds a master's degree in civil engineering and an MBA from Arizona State University. LTC Johns is a graduate of CGSC and is a registered professional engineer in Virginia.

After airborne and ranger school, he served for three years with the 78th Engineer Battalion (C) in USAREUR before going to Vietnam. His most recent assignments include squadron executive officer with the 3rd Armored Cavalry Regiment and chief of personnel assignments, Combat Support Arms Division, OPMD, MILPERCEN. He was the Chief of Engineer Branch, OPMD and is now the commander, 4th Engineer Battalion, 4th Infantry Division.

ENGINEER HOTLINE

Problems, questions, and comments relating to Engineer doctrine, training, organization, and equipment can be addressed by telephone to the U.S. Army Engineer School's "Engineer Hotline." The Hotline's auto-answer recorder operates 24 hours a day, seven days a week. You should give your name, address and telephone number, followed by a concise question or comment. You'll receive a reply within three to 15 days. **The Hotline is not a receiving agency for formal requests.**

Call commercial (703) 664-3646; WATTS 800-336-3095, extension 3646; or AV 354-3646.

NIGHT CROSSING

by LTC Richard V. Gorski and 1LT William Vickers

Soldiers practice connecting MABs during daylight hours to prepare themselves for more challenging conditions of nighttime operations in MOPP IV (staff photo).

For some time the 2nd Armored Division had been in contact with the enemy. Intelligence reports of a decisive and successful battle against elements of the 1st Shock Army began to emerge. A warning order alerted the division that it would soon be maneuvered against other forces elsewhere. The 17th Engineer Battalion's Echo Company knew that it would play a major role in the upcoming operation.

The terrain facing the division was crisscrossed with small streams and rivers. Most permanent bridges had been demolished earlier during the war. Clearly, river-crossing operations would have a great impact on the results of any engagement. The side with the more efficient, better trained mobile bridging assets would have a great advantage.

As Echo Company escalated its preparations for the coming battle, the S-2 reported extensive enemy use of chemical weapons. Enemy intelligence was excellent and would be watching carefully for any movement of our Mobile Assault Bridges. Since the enemy controlled the skies during daylight, the division would have to move at night to escape detection.

A night river-crossing under total blackout conditions . . . possibly in a chemically contaminated environment . . . could Echo Company pull it off? . . .

Fortunately, this scenario was just the fictitious build-up to one phase of exercise Hardened Steel VII, the 2nd Armored Division's annual spring exercise. But the mission was real: construct two MABs in MOPP IV in total blackout.

Our division commander, MG John W. Woodmansee Jr., had issued a warning order for this mission after the previous spring's exercise. Operating and constructing a Mobile Assault Bridge isn't easy under the best of conditions. Doing it in either MOPP IV or in total blackout is difficult enough. Putting it all together in complete chemical protective gear and in total blackout is a task that the MAB's designers probably never envisioned.

With a year to get ready, we needed a training program that would sustain our high level of proficiency through the inevitable personnel changes and develop crew proficiency and confidence rapidly and safely. Echo Company designed such a program to be ready for a blackout MOPP IV crossing in stages: daylight bridge construction and rafting procedures; daylight operations wearing protective masks; night bridge construction and rafting procedures; and ultimately, night operations in MOPP IV in total blackout.

Because Fort Hood's famous Cowhouse Creek is too narrow and too shallow to support MAB operations, most of the training took place in Belton Lake, the man-made reservoir created by the damming of Cowhouse Creek near the Fort Hood reservation. Calm-water MAB operations on a lake don't simulate moving water operations on a typical fast-moving German river, but in Texas you use the water that God gives you and you're thankful for that!

Initial training took place in the heat of summer. MAB crewmen practiced driving their rigs into the water, maintaining a tight formation, throwing the ropes used to pull the rigs together, connecting the rigs into rafts, maneuvering the rafts, and finally landing the rafts onto the shore. Because time is precious when constructing a bridge, all the exercises emphasized teamwork and were geared towards saving time.

And teamwork was the key. Individual MAB rigs had to enter the water smoothly and stay in formation. As rigs were called in by the raft commander, a deckhand on each rig threw a rope to his counterpart on the adjacent rig,

wrapped it quickly around the capstan, and used the rotating capstan to tighten the ropes and draw the rigs together.

Practice ensured that the rope was caught on the first attempt so that no time would be wasted pulling a missed rope out of the lake. As the ropes were drawn tight, the crewmen carefully controlled the speed of the capstans so that the rigs would slide together smoothly. After inserting the hydraulic pin connectors and checking them for secure fit, the raft commander called in the next MAB rig to hook up.

After individual rigs had been hooked together to form a raft, the raft commander began maneuvering the raft into position to form a bridge. If the raft commander missed the precise landing spot on each shore, the bridge would be off the centerline of the crossing site. If the ramps failed to hit the landing site on the first pass, the raft would sweep past the landing site and lose valuable time maneuvering back into position.

There were usually about 18 to 20 crews in the company at any one time; seven or eight crews and their rigs were needed to complete each bridge. Cross-training in crew skills meant each drill had to be repeated several times to ensure proficiency. Moreover, although most of our training was done by platoon and stressed section integrity (there are two MAB sections in each platoon), cross-section and cross-platoon training was required to prepare us for any eventuality.

Once we had achieved a reasonable level of proficiency—and this took quite a lot of practice—we did it again, this time wearing chemical protective masks.

Working in protective masks immediately caused problems. Aside from the obvious difficulties of limited vision and reduced ability to communicate, the troops couldn't fasten their steel helmets over their masks. Unfortunately, a few helmets were lost in the river before a clever sergeant convinced his lieutenant to store the steel pots in the cabs of the MABs.

Impaired peripheral vision was not so easy to correct. The raft commander had to learn to look at each marine drive operator in turn to be able to tell if all marine drives were being operated correctly. Engine noise and the ever-present wind compounded the problem of communications between raft commander and marine drive operators. The raft commander had to be especially clear and concise with his verbal instructions, use exaggerated hand and arm signals, and act without hesitation. Otherwise, operators would become confused and unsure of their actions.

By comparison to what was to come, the training so far was easy.

We had practiced before, performing night crossings in total darkness without cab lights, running lights, or even flashlights. A single MAB could easily become misoriented in the darkness; therefore, each crew chief was carefully briefed on his position in the formation in the water. He had to keep the MAB in front of him in sight and be ready to hook up when his turn came, yet he could not get too close or he would limit the other rig's maneuvering room.

Other minor problems caused by limited visibility were solved one by one through attention to detail, discipline, and practice. For example, usually the hydraulically actuated pins which hold the raft together are checked visually by the raft commander. Since we couldn't use any lights and fluorescent paint and tape were useless, we learned how to physically feel for the correct placement of the pins. This involved some potential danger and discomfort to the raft commander which we just had to acccept.

Operating the MABs at night and with M-17 protective masks turned out to be less difficult than we had expected. The practice without masks at night and with masks during the daylight had paid off. Crew confidence was amazingly high. Raft commanders would run along the bridge roadway until they could stand directly in front of and communicate with particular operator.

Of course constructing a bridge is only half the battle. Getting traffic across the bridge is an integral part of the effort—and doing it at night creates some special problems.

Previous river-crossing exercises had taught us the importance of well trained ground guides. Keeping traffic moving quickly and steadily at night absolutely requires well trained ground guides.

Vehicles equipped with night vision devices, like the M-1 Abrams and the M-2 Bradley, can see a ground guide's hand and arm signals without any additional light. Other vehicles require that the ground guides have a light in each hand so that their signals are visible. In either case, the ground guides have to use standard hand and arm signals that are known to the vehicle drivers, and their hand and arm movements have to be bold and exaggerated.

The ground guide's position is also critical. He can hamper the vehicles he is guiding if he is too close to them. If he's too far away, the drivers can't see

Under the cover of darkness and protected by their MOPP equipment, soldiers of the 17th Engineer Battalion, 2nd Armored Division, work to connect their MABs to provide the maneuver brigades the means to cross a water obstacle (U.S. Army photo).

him. Several guides on a bridge are necessary. By keeping their distance and handing off vehicles from one guide to the next, the guides can keep the traffic flowing at near-daylight rates. We found that one of the most important roles of the officer who was the bridge site commander was to watch the efficiency of the ground guides and ensure that correct procedures were being followed.

We also found that we could wear AN/PVS-5 night vision goggles (NVGs) over our M-17 protective masks. Some ground guides had great difficulty at first coping with the severe tunnel vision effect, but like everything else, practice instilled confidence. With the NVGs, the ground guides could see the oncoming traffic as well or better than the traffic could see them.

Previous night-bridging missions had proved the value of chem lights. By putting a chem light inside a C-ration box or a tin can, the light is visible from only one direction. We would use lights like this to mark the landing sites so that raft commanders could see in the dark exactly where to position their bridge ramps. We would also use them to mark the bridge site's approach and exit roads.

Chem lights would also be used by the ground guides. By holding the chem lights in their foil wrappers so that just their tips were exposed, the lights would not be visible outside the bridge area, and they would not blind vehicle operators using night vision devices.

We found that chem lights made identification of key personnel a snap. Using "100-mile-an-hour" tape, we taped a chem light to our left sleeves just below our shoulders. By taping over the chem light and leaving only narrow bands of light showing, we could easily identify leaders—one light band for NCOs, two for junior officers, three for senior officers. By doing the job carefully, we solved two problems: how to identify key personnel at night in MOPP IV and how to prevent those leaders from being too visible under night vision devices.

. . . in the bivouac area we anxiously awaited word from battalion S-2 about what was happening on the front lines. The MABs were well concealed under heavy camouflage. Although we were in the division rear and occupying a fairly secure area, we kept our perimeter security alert. We didn't want any surprises from OPFOR airborne forces.

Finally the word arrived. Division had successfully counterattacked and destroyed an enemy division. As part of our move to another part of the corps area, the division would conduct a retrograde operation. The move would have to be done at night for concealment. We were cautioned that several areas had been chemically contaminated during the battle and that all the permanent bridges were destroyed.

Echo Company's mission: construct two bridges across Cowhouse Creek after dark and cross the division before daylight. And since the crossing areas had been hit with chemical weapons early that day, conduct the entire operation in MOPP IV!

This was it! All that training would finally pay off. The bivouac area was humming with activity. The air of restlessness that had permeated Echo Company during the past days was replaced with one of excited anticipation. Personal equipment was scrutinized by the practiced eyes of the section sergeants. MOPP gear was checked one final time for serviceability. At the pre-operation briefing, final instructions were issued.

Plans were finalized and the crews thoroughly briefed. We stressed attention to detail, light and noise discipline, MOPP IV procedures, and safety. We had to be ready to cross traffic at 2100.

At precisely 1900, 1st Platoon emerged from its perimeter and 2nd Platoon followed 15 minutes later. As each checkpoint was passed, the platoon leader reported his position by radio. At the final checkpoint before the crossing area, the convoys pulled over, dispersed, and assumed MOPP IV. Light was fading rapidly. At 1930 the first MAB splashed into the water on schedule.

The first three interior bays went together without incident. The next two were a struggle. Time and again the bridge commander would bring the MABs close, the capstans would scream with their coils of rope, but the pins would not slide into place. Sweat poured off the men on the ropes, pooling in irritating puddles at the base of their protective masks.

Finally, after we tried every trick in the book, the pins grudgingly slid into place, and the process of closing the bridge began. First, the two free interior ends were brought together, and ropes were thrown to form a "V" in the middle of the river. By raising the ramps, throwing the MAB marine drives into full throttle reverse and then lowering the ramps, the ends of the bridge were slipped into place. The exhausting process had taken almost 1 1/2 hours.

It was now 2055. The troops had worked up quite a sweat under their MOPP gear. The cool night air cut easily through their protective suits.

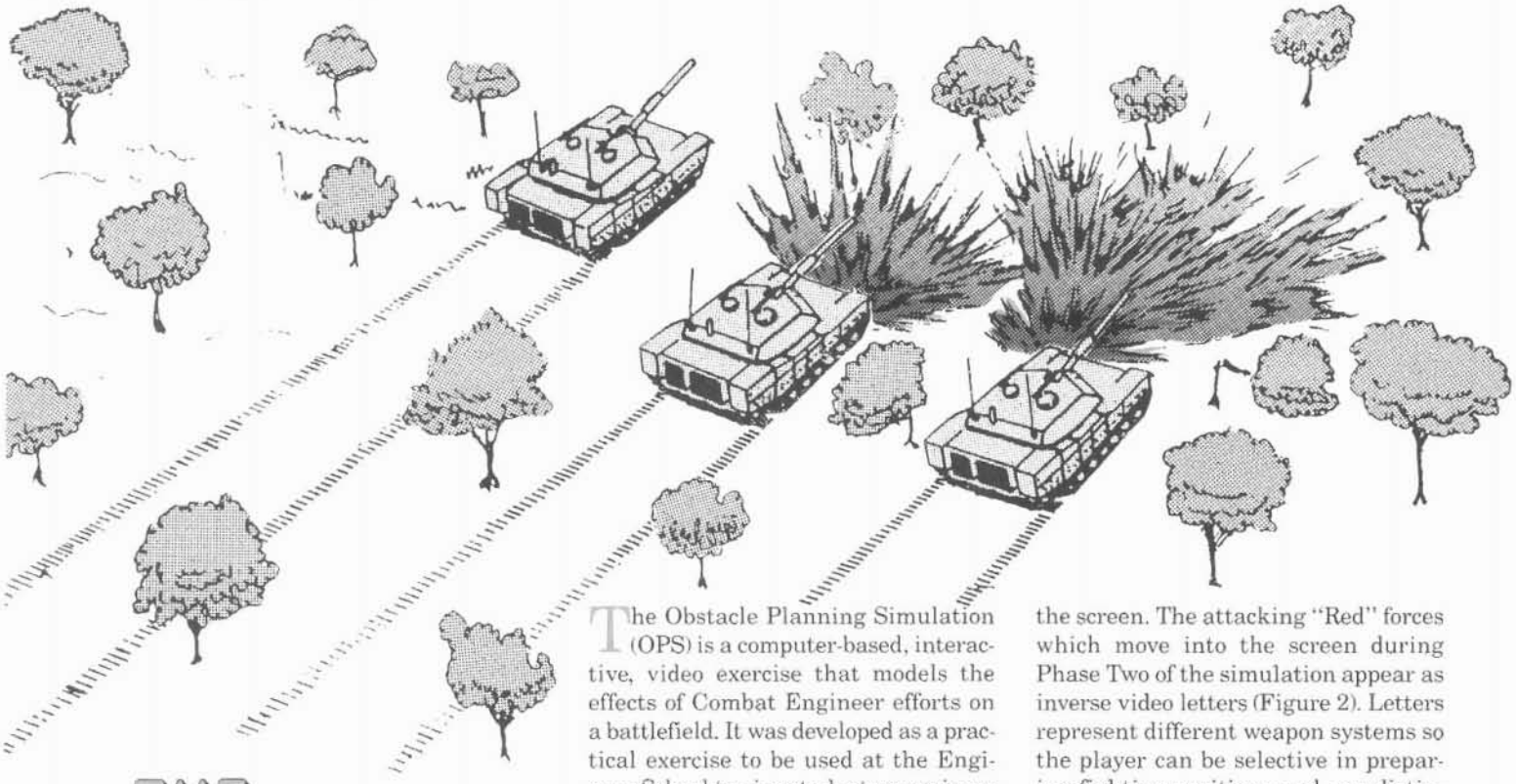
Then we felt the rumbling of tons of Abrams tanks. Next came the distinctive sound of road wheels picking up and laying down track. Before we knew it, they were upon us and crossing. The 2AD was here.

Ground guides worked smoothly and carefully. Shifts moved in and out with the precision of a drill team. By morning it was over. The retrograde was complete.

The division had called for a total blackout crossing in MOPP IV. Echo Company had delivered!

LTC Richard V. Gorski is attending the U.S. Army War College. He previously commanded the 17th Engineer Battalion at Fort Hood, TX. LTC Gorski is a 1966 U.S.M.A. graduate and has a master's degree in civil engineering from Stanford University. He is a registered professional engineer in California.

1LT William Vickers is a platoon leader in the MAB Company of the 17th Engineer Battalion, Fort Hood, TX. He completed EOBC and the Atomic Demolitions Course at Fort Belvior, VA. 1LT Vickers has a bachelor's degree in civil engineering from the Virginia Military Institute.



THE OBSTACLE PLANNING SIMULATION

by John M. Deponai III
Dr. James E. Snellen
CPT Rick Jones
CPT Leo J. Fontana

The time is 0730Zulu, CPT Brown breaks into a cold sweat. His Engineers, in support of a Combined Arms task force in defense, have been frantically emplacing obstacles and digging-in weapon systems. This is according to an obstacle plan he designed in response to the maneuver commander's concept of the operation. CPT Brown knows that within the next 8 to 16 hours, the battle south of Bad Hersfeld, West Germany, will begin. . . .

As CPT Brown leans back in his chair, the computer screen flashes with the arrival of the "Red" forces. Now he will see just how effective his obstacle plan really is, using the Obstacle Planning Simulation at the U.S. Army Engineer School.

The Obstacle Planning Simulation (OPS) is a computer-based, interactive, video exercise that models the effects of Combat Engineer efforts on a battlefield. It was developed as a practical exercise to be used at the Engineer School to give students experience in survivability and countermobility missions.

OPS is a two-phased exercise. In Phase One, the player modifies battlefield terrain with an obstacle plan of his or her own design. Engineer resources are limited. The player is guaranteed a minimum of two blocks of simulated time, each representing four hours of Engineer effort, but may get a maximum of four blocks of time to implement an obstacle/survivability plan. Thus, as in real life, priority of work is critical to the success of the battle plan.

Phase Two is the battle. Once the battle begins, the player observes the effectiveness of individual obstacles and the obstacle plan in general. One of five significantly different, doctrinally sound enemy attacks is directed against the "Blue" force defensive position. The paths of the attacking "Red" forces are programmed into the model.

Map Display

The map shown on the computer terminal (Figure 1) is an abstraction of an area 6 km by 12 km in West Germany, south of Bad Hersfeld. OPS is designed to take into account the effects of terrain in vehicle movement rates and line-of-fire/line-of sight. However, it will not allow the player to emplace nonsense obstacles, such as a bridge demolition where there is no bridge!

"Blue" force units are represented by letter designations in small squares on the screen. The attacking "Red" forces which move into the screen during Phase Two of the simulation appear as inverse video letters (Figure 2). Letters represent different weapon systems so the player can be selective in preparing fighting positions and can distinguish one "Red" force unit from another.

Simulation Model

OPS is modeled after the Dunn-Kempf Simulation. In contrast, OPS does not model effects of artillery and does not require more than one player. OPS allows a single user to enter an obstacle plan at a computer terminal, then observe its effectiveness as the "Red" force attacks across the map screen. Both enemy and friendly fires can be observed as OPS models weapon ranges, simulates the effects of obstacles and fighting positions, and uses probability tables to access casualties much the same way Dunn-Kempf does.

During Phase One, the player may choose from a variety of defensive works and obstacles as shown in Figure 3. Reusable assets are noted in the upper corner of the display with expendable assets below. As the player makes a selection, assets required for that particular task are noted, and the player may place that obstacle on the map screen if sufficient assets are available.

Future Developments

Future versions of OPS will enhance its utility as a training tool. By May 1985, Engineer School instructors will have the capability to design their own scenarios, to vary map type and scale, and to tailor "Blue" and "Red" force

composition and size. This scenario editor will be used to demonstrate the value of obstacles and fighting positions, the importance of capitalizing on weapon range superiority (stand-off distance), and effects peculiar to different terrain types. A more detailed statistical analysis than the "Combat Losses" shown in Figure 2 will also be available. In October, OPS will have the additional option of allowing the player to interactively maneuver the "Blue" forces during Phase Two while the "Red" forces attack.

Thus, CPT Brown and the officers who follow him to the Engineer School will be able to take advantage of a unique training tool. OPS will allow Combat Engineers to experiment with obstacle placement and gain a greater appreciation for the factors that affect obstacle planning.

More Information

Information on the technical aspects of OPS is available in *Obstacle Planning Simulation (OPS): Introduction and User Instructions* by John M. Deponai III and James E. Snellen. This technical report, P-85/08 (January 1985) ADA 149468, was published by the Construction Engineering Research Laboratory (CERL). It can be ordered from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

For more information on OPS at the Engineer School, contact the Field Engineering Branch, DME, at AV 354-3411, commercial (703) 664-3411.

John M. Deponai III leads the Military Engineering Team at the U.S. Army Construction Engineering Research Laboratory (CERL), at Champaign, IL. He graduated from the United States Military Academy and

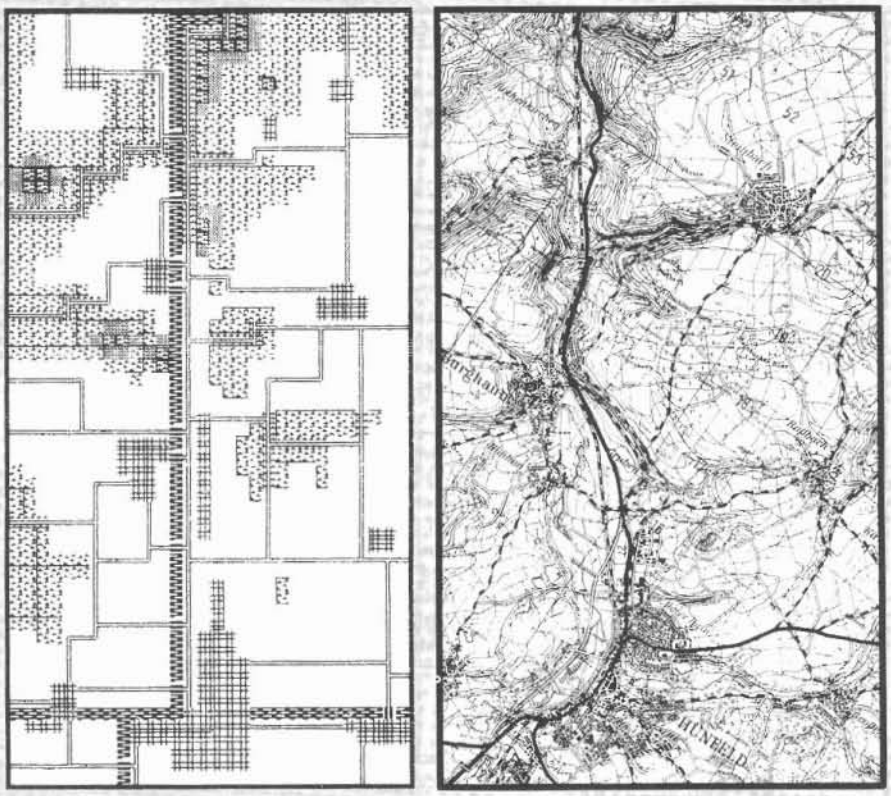


Figure 1. The topographic map of the battlefield (right) is portrayed by the computer screen (left).

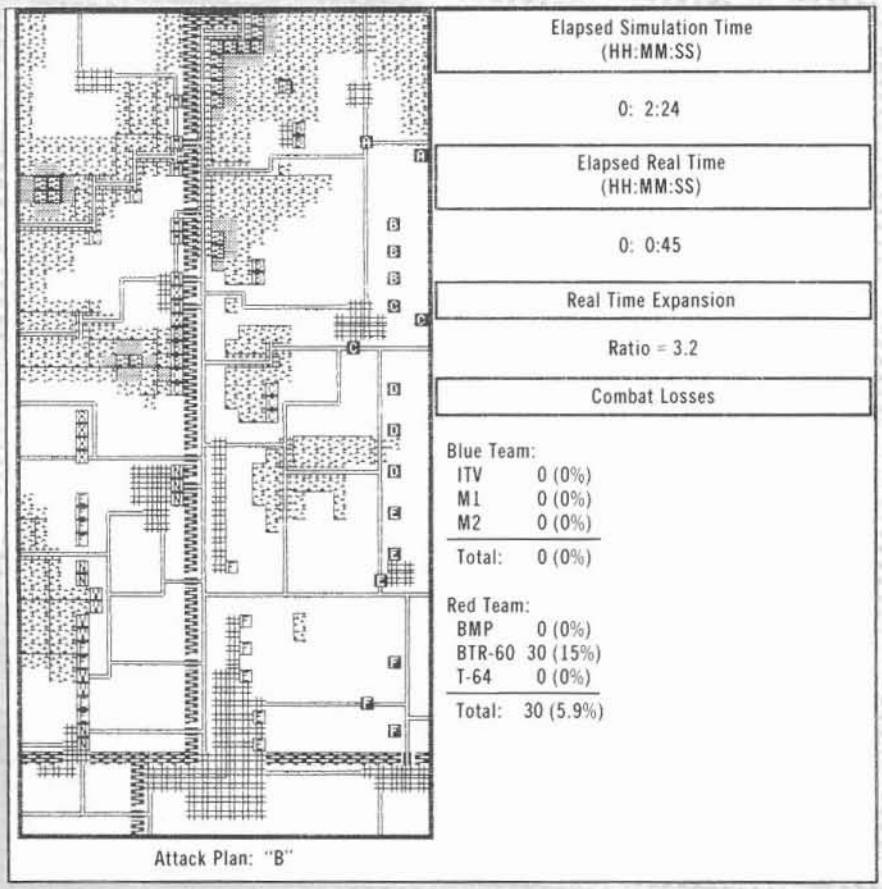


Figure 2. The Phase Two screen shows "Red" Forces attacking from right to left (inverse video) over the terrain map. NOTE: The right side of the screen shows simulation time which approximates the time an attack would actually take. Real time represents the time a player spends observing the attack. Expansion is the ratio of real time to simulation time. Combat losses show the number and type of vehicle casualties and a percentage of the total.

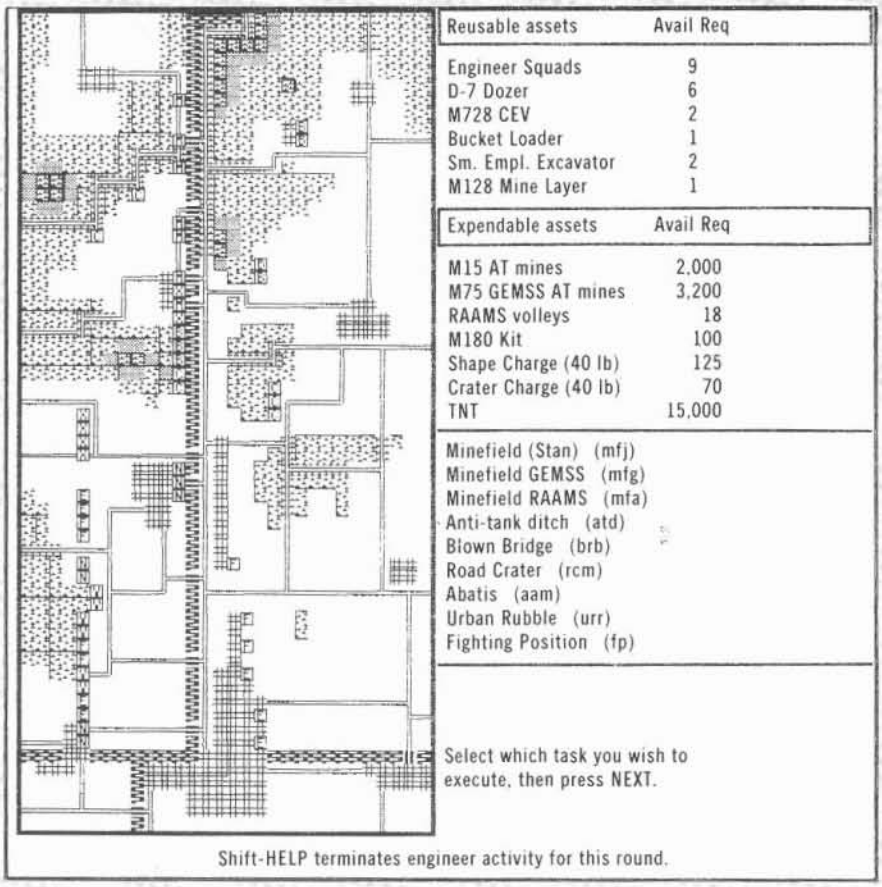


Figure 3. The computer display during Phase One portrays the assets available to emplace selected obstacles or fighting positions.

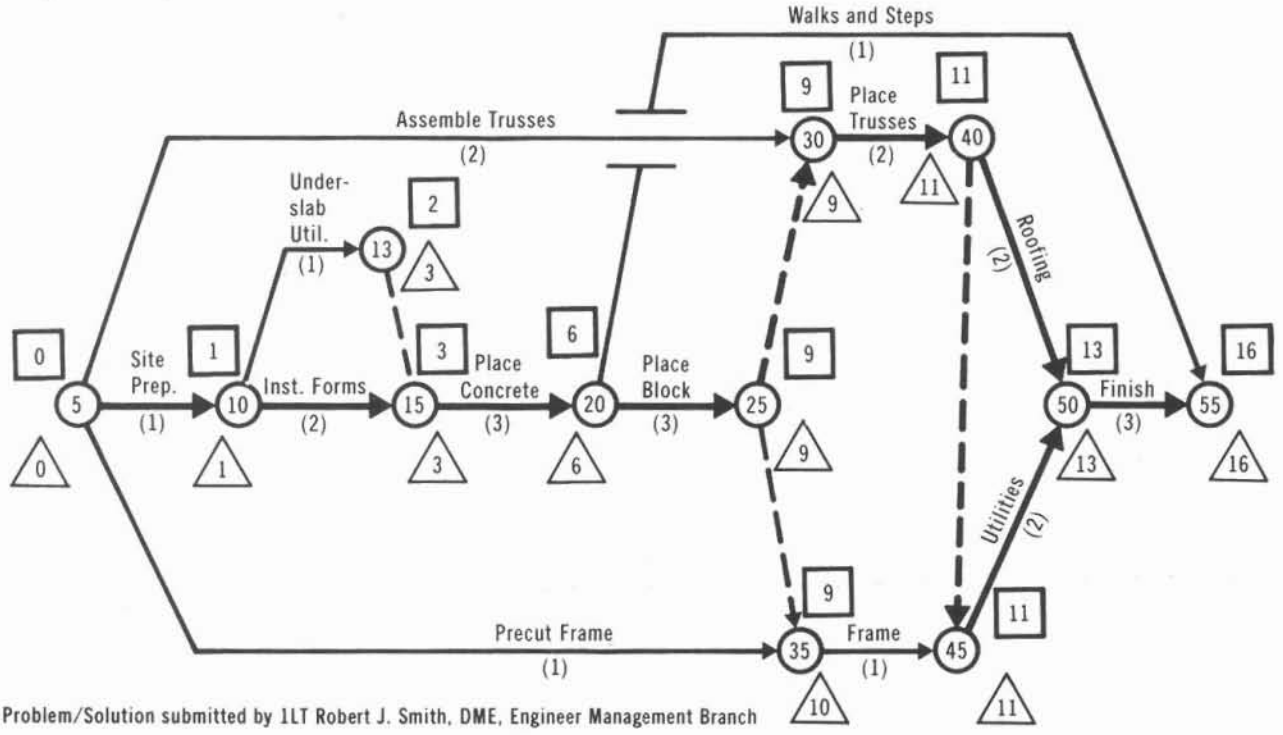
served over eight years as a Combat Engineer. Mr. Deponai received his master's degree from the University of Illinois.

Dr. James E. Snellen is a research programmer at the Microcomputer Systems Laboratory at the University of Illinois at Urbana. He has a master's degree from California State College at Long Beach and a doctorate from the University of California at Davis.

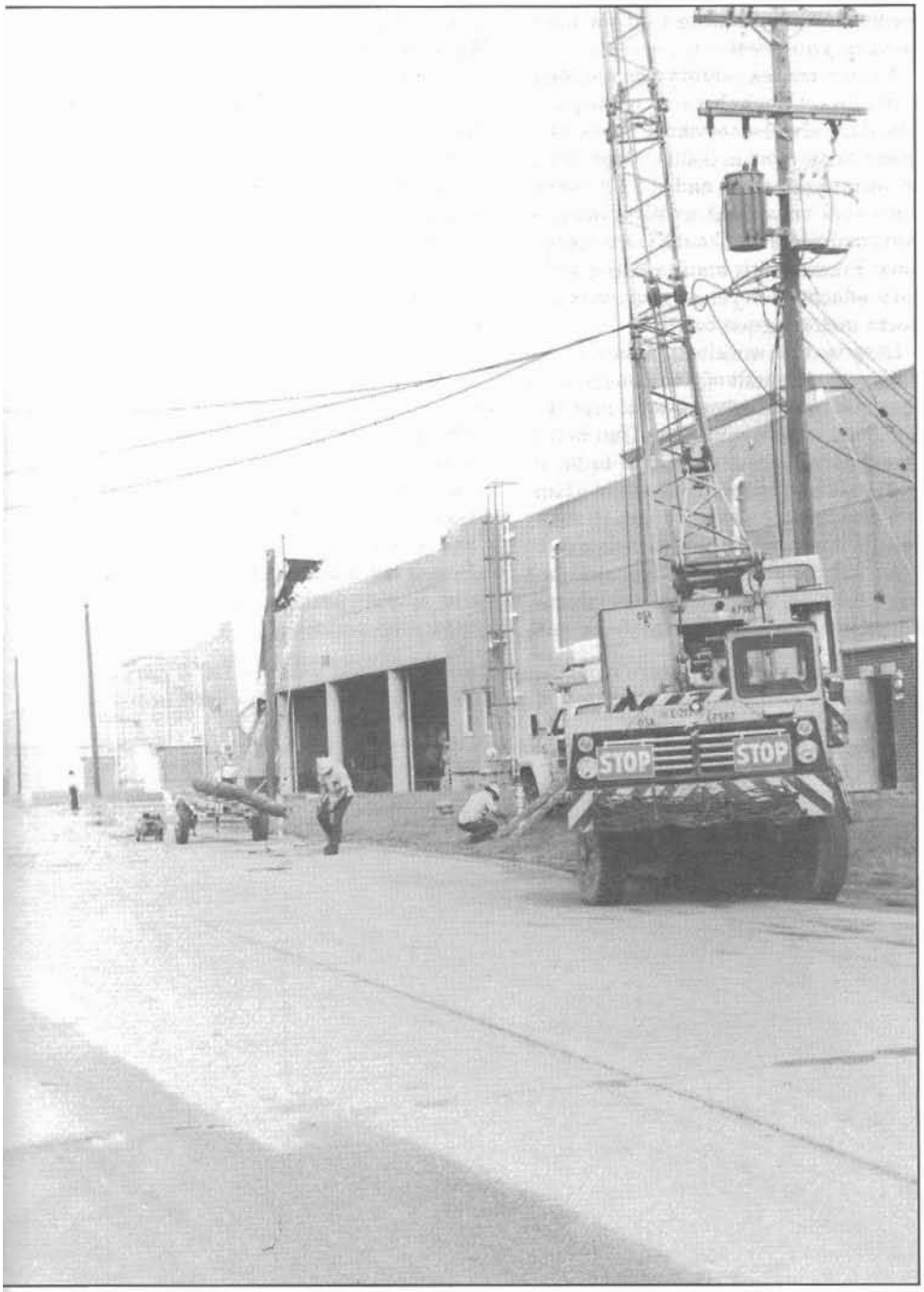
CPT Rick Jones is an instructor in the Field Engineering Branch, Department of Military Engineering, at the U.S. Army Engineer School. He was previously assigned to the 23rd Engineer Battalion in Hanau, Germany. CPT Jones graduated from the Engineer Officer Advanced Course and Virginia Military Institute.

CPT Leo J. Fontana is a project officer in the Technology Training Branch, Department of Military Engineering, at the U.S. Army Engineer School. He was previously assigned to the 78th Engineer Battalion (Combat) in Ettlingen, Germany. CPT Fontana is a graduate of the United States Military Academy.

Engineer Solution



Problem/Solution submitted by 1LT Robert J. Smith, DME, Engineer Management Branch



Exterior line crew, Jimmy Robertson and Herbert Hudgins, perform recovery operations to restore power knocked out when a plane crashed into Building 550 at Defense Depot Memphis (photo by Willie Jones).

The Facilities Engineer in a Defense Logistics Agency

by MAJ Roger L. Gorres

It all starts with a call from the Engineer assignments officer at MILPERCEN. "You're being nominated for a Facilities Engineer (FE) position in the Defense Logistics Agency (DLA)."

You hold your reply, and he asks, "Are you still there?"

By now you have recovered enough to say, "What is DLA?"

The conversation then encompasses the role and mission of DLA and how it serves the other Department of Defense organizations. The initial conversation ends with your needing to reply to MILPERCEN by a certain date, accepting the duty. Still in a state of surprise, you make urgent phone calls to your superiors, your former commanders, and others trying to learn the status of a position called Chief, Facility Engineering Division, Defense Depot Memphis.

The next day you receive a phone call from the present Engineer officer in the slot and have many of your questions answered—and new ones formed. So you call back the assignments representative and calmly say that you will take the job, little realizing that you have just agreed to perform the toughest duty in your military career to date.

When your name hits the installation commander's desk, he talks to the present FE and several of your previous commanders to receive a commander-to-commander report of your abilities. While this is taking place, you are reviewing your decision and wondering if you have made the right choice, even though it is considered a joint service assignment. This is all forgotten when the next phone call informs you that you have been accepted and must report on a certain date, after going through the Facilities Engineering Management Course (FEMC) at Fort Belvoir, VA.

Your time is busy as you leave your organization; go to the FEMC; take a short vacation; receive an orientation from the Director of Installation Services and Environmental Protection, HQ, DLA, Cameron Station, VA; and finally arrive at your new home. The outgoing FE and his family warmly welcome you, as do the other military members of the depot.

As the FE introduces you around, you quickly realize that 99 percent of the work force is civilian. You also observe that the FE is a very ***busy*** individual,

but you dismiss this as the usual urgency suffered by all officers preparing to depart a duty station. You even accompany him on an emergency call at 0200 concerning an air conditioning problem for the base computer facility. He shows you the emergency procedures to follow for the myriad utility requirements of the 642-acre complex (109 buildings, 33 miles of paved road, 26 miles of railroad track . . . total 1985 replacement cost of more than $837 million).

Toward the close of the two-week transition period, the FE spends more of his time preparing to leave, and you start sitting in ***the chair***. You make some initial decisions of minor importance and begin to feel that this job will be easy. After all, your official duty hours are from 0730 to 1600.

The old FE departs early on a Saturday morning, and the weekend is uneventful; so you approach Monday morning with a relaxed attitude. Then it happens. From the time the work bell rings until the office closes, you are BUSY. You make more decisions the first day than on any other day you can recall, including the worst days of your company command time. By the end of the first month, it starts to dawn on you just how BIG a job you have. Now you understand the old FE's last comment, the one about his inability to describe the difficulty of the job. You begin each day with the renewed determination and the desire to learn more, but you're grateful that the old FE left you with the work planned for the next four months.

Even with a 90-man, highly dedicated work force and no difficulty in obtaining funds for your work, you soon realize that you will never accomplish 100 percent of your requirements. There is just too much to do, and not enough time to do it in; so you concentrate on the most important 90 percent, an ability that must be acquired quickly.

The variety of work and complexity of decisions you must make are never-ending challenges. One minute you are in a telephone conversation with DLA headquarters concerning an $8 million MILCON (military construction) project, and the next minute you have an emergency phone call from security concerning a fire in a building.

You deal with your District Engineer, tenant commanders, architectural engineering firms, various EPA (Environmental Protection Agency) offices, and many other organizations. The realization soon sets in that *the buck stops at* ***your*** *desk.*

As time passes, you start to measure it in units of weeks because of the pace. The days are just too short to use as a guide. Some start at 0530 with physical training, and others end at 2200 hours with work on your Army War College's National Security Course Correspondence Program (to maintain the military education level of your counterparts ***not*** assigned to DLA).

Despite the workload, there is an unexpected benefit of your assignment that also comes to your attention at the six-months self-evaluation. That is the fact that you are always able to be at home with your family at night. This is a real treat, and they begin to enjoy your being there. The joy of seeing your wife and children each night and being able to plan time together—without last minute changes—is great!

Your first meeting with the other FEs at the DLA-wide RPMA (Real Property Maintenance Army) conference is an eye-opener. Your counterparts have many of the same challenges and goals that you do. This initiates some very beneficial communication at the conference, which continues with phone follow-ups until the next year's conference.

The following are just a few of the major concerns that FEs in DLA are currently working on:

Commercial Activities Program (CAP)

- Preparing a work statement for your requirements.
- Designing a most efficient organization for winning the bid between you and a commercial contractor.
- Preparing a budget for your entire division's personnel and non-personnel costs.

Two Memphis firefighters extinguish flames caused when a DC-3 cargo plane crashed through the roof of a Defense Depot Memphis warehouse (photo by Willie Jones).

- Computerizing the "stubby pencil" operations of the division, without benefit of IFS (Installation Facility System).

RPMA Actions

- Finding solutions to ongoing and old work for in-house, local, DLA-approved and MILCON work.
- Planning for the computerization of drafting requirements for CAD/CAM (computer-aided design/computer-aided manufacturing), including compatibility with the District Engineer and local architectural engineering firms.
- Streamlining the in-house work force in preparation for the CAP bid.
- Implementing FAR (Federal Acquisition Regulation) procurement changes which concerning all phases of FE work.
- Developing high-quality procurement specifications to FE contracts.

One of the pleasant surprises of working in DLA is the association with other "purple suit" military. The three-year tour provides an opportunity to learn and develop under the management practices of four services. As the headquarters level (lieutenant general/vice admiral) and field level (brigadier general/rear admiral or colonel/captain) commanders change, you adapt not only to a new command style, but also to different service methodologies. This interservice working relationship could be most beneficial in a future assignment. The experience goes far beyond the usual benefit of obtaining credit for "joint service" work.

But what is the mission of DLA? Briefly, DLA is responsible for acquiring, receiving, storing, and shipping military supplies common to two or more military departments. A key requirement of the mission is to get the supplies to the requester ***on time***. For the FE, this means ensuring that the physical plant is operational 24 hours a day, 7 days a week, 52 weeks a year.

This means that all utilities are available (especially the electrical needs of the computers), the appropriate areas are properly heated or cooled, adequate lighting is provided, the roads and rails are open and safe, and you are accomplishing ***all*** work (maintenance, repair, alteration, and construction) requirements in a timely manner to preclude interruption of the mission. For Engineers who have spent their time in either District Engineer or troop positions, the previous sentence says more than you can imagine. Those who have been in DEH assignments know what it means, but realize that it is impossible to convey to non-FE types.

If anyone is interested in doing such a job, there is more to consider. An example of what may happen at a moment's notice follows.

THE PHONE CALL (Every FE or DEH gets one, don't they?) comes in at 0100 on a Friday night. It has been a hectic week; the 40-hour official work week has really been 60 hours. You know the instant the security desk sergeant says his first word ("Major, . . .") that ***this is your PHONE CALL.***

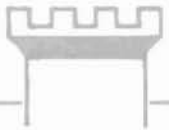
"Major, an airplane has just crashed into Warehouse XYZ, and the building is on fire."

One second you were sound asleep, and the next second you are wide awake, mentally analyzing the exact location of the building and its utility connections, while simultaneously dressing in record time.

You and the first fire truck meet at the crash site, and you're stunned at what you see. You leave the scene 16 hours later, feeling ***years*** older, with three airline personnel dead and the building and contents loss approaching $10 million. However, the DLA mission of receiving, storing, and shipping continues with little or no delay; and except for one fifth of one building destroyed, the installation is fully operational by Monday morning.

This is a brief synopsis of what a DEH in DLA (it's still called an FE) assignment is like. Some things are certain: You will never be bored, never run out of something to do, and never have enough time to do all that is required. If you are a major who wants the challenge of being the DEH (and not the operations officer) and don't want to wait until promotion for such a position, an assignment in DLA could be just what you are looking for.

MAJ Roger L. Gorres is Chief of the Facility Engineer Division, Defense Depot, Memphis, TN. He was previously assigned to the 547th Engineer Battalion, Darmstadt, Germany; the 14th Engineer Battalion (Combat), Fort Ord, CA; and the U.S. Army Readiness Group, Fort Snelling, MN. MAJ Gorres is a graduate of the Engineer Officer Basic and Advanced courses, the Command and General Staff College, and the Army War College's National Security Course. He has a bachelor's degree in industrial engineering from North Dakota State University and a master's degree in business administration from the College of St. Thomas in St. Paul, MN.



Hotline Q & A

Q. Can I plug into the Engineer School computer system with my home computer?

A. Dial-in access to the Engineer School computer system is scheduled to begin at the end of September. Computer software must be compatible with PLATO and will include lessons in general and military engineering, other military topics, and the Obstacle Planning Simulation (OPS). Computer courses delivered at Ft. Belvoir will also be available at education centers in CONUS. For further information, contact CPT Leo Fontana, (703) 664-3953, AV 354.

Q. What is the National Stock Number (NSN) for staples and tie wire used in constructing triple-strand concertina wire obstacles?

A. There is no NSN for the staples or tie wire. There is, however, a Federal Stock Number under Class 5315 and 9505, respectively. Staples can be fabricated locally, and #10 gage smooth wire can be used for tie wire.

Q. What is the Basic Initial Issue (BII) for the bridge transporter in a ribbon bridge platoon?

A. The BII for the M-812 is found in TM 5-5420-209-12, *Improved Float Bridge (Ribbon Bridge).* See pages B-4, C-1, and C-2.

Q. Where can we order copies of *Engineer Enlisted Professional Development?*

A. The publication has recently been reprinted and is available through the Engineer Proponency Office, ATZA-EP, Ft. Belvoir, VA 22060-2591. For further information, contact SFC Bob Wagner, (703) 664-3760, AV 354.

The Wallmeister

A Living Genie

by LTC Robert H. McDonald

The view of the valley below was absolutely breathtaking, especially after our German guide pointed out that we were over 500 feet above the valley floor. Perched cautiously below the roadway surface on one of the bridge piers, we paid close attention to our guide's instructions, crawled back to the security of solid ground under our feet, and departed. This was not a "budget special" tour of Europe, but an orientation visit with a wallmeister team.

Historical Perspective

The wallmeister, translated literally as "rampart master," is a highly specialized engineer of the German Army (Bundeswehr) who is a gold mine of information for fellow NATO Engineers. In performing his mission of territorial defense, he follows in the proud footsteps of his predecessors centuries ago.

Fortification specialists have always been key members of armies. One of the oldest examples of their work is the Great Wall of China, while the Porta Nigra (Black Gate) in Trier remains as one of the best examples of Roman fortifications in Germany. During the Middle Ages in Germany, the Festungsbaumeister (fortress construction master) supervised the building of fortified castles and the construction of town defensive works. The term "wallmeister" was used as early as 1693 when Prince Frederick III mentioned these craftsmen in his *"Standing Orders for Fortification Measures in the Fortress."*

Wallmeister Training

Originally passed down from master to apprentice, wallmeister training was formalized in a school founded in Berlin in 1886. Several similar schools were established in other German cities between 1886 and 1914. In 1922, the various training locations were centralized and consolidated at the German Army Engineer School in Munich, where wallmeister training continues to this day.

While training of the wallmeister before 1886 concentrated on the construction of massive defensive works, the Berlin school broadened the course of instruction, and wallmeisters who served in the Reichswehr (World War I) or the Wehrmacht (World War II) received a more diversified curriculum like that currently presented to wallmeisters. The course now includes training in terrain reinforcement, obstacles and explosives, and weapons-system capabilities so that the wallmeister may be a true source of Combat Engineering expertise. This training in purely military areas follows a two-year Engineering Technician's course that includes subjects such as technical drafting and construction of permanent structures. To keep abreast of new developments and share their work experiences, wallmeisters annually attend a week-long advanced technical course.

The modern wallmeister is a true specialist with no real counterpart in the U.S. Army. Typically, he is a senior Engineer noncommissioned officer who volunteered for wallmeister duty and was selected based on past duty performance and technical expertise. A wallmeister receives no special pay for his job. Like his peers in active Bundeswehr units, he is paid based on his rank and service time.

After his selection, the wallmeister attends the Bundeswehr Engineer School in Munich for his specialized schooling. Upon completion, he is sent to his first wallmeister assignment, based both on where vacancies exist and on his personal desires. Once assigned, he can expect to stay in that location for ten years or more, depending on the time remaining until his mandatory retirement at age 53 or until his enlistment term expires. The benefits to the Bundeswehr of such a long service in one location are as great as they are to the wallmeister and his family.

Wallmeister Team

A wallmeister team has three members. The team chief is normally an active military E8 or E9 who is in a career military status and likely to be a wallmeister until he retires. The other military member is normally an E7 who is either in a career status (and may become a team chief upon a vacancy in his team or another team) or is a long-term enlistee who serves on the team until reaching the end of his 10 or 15-year enlistment. The third member of the team, the driver, is a government civilian who commonly is also a Bundeswehr reservist.

Wallmeister teams normally operate from an office on a Bundeswehr

kaserne, but they are under the supervision of an Engineer officer at the Military Region Command (Verteidigungsbezirkskommando—VBK). The VBK staff engineer office sets work priorities and serves as the official link between the team NCOs and the Bundeswehr for personnel actions and other military matters.

The VBK, in turn, reports to the Military District Command (Wehrbereichskommando—WBK), which is subordinate to either the Northern or Southern Territorial Command whose mission is basically providing territorial defense rather than functioning as a major maneuver force headquarters.

Thus, while they are active-duty Engineers, wallmeisters are associated not with the active forces but with the home-defense element of the German military. This reporting chain shows why one of the paramount qualities considered in selecting an NCO for wallmeister duty is his ability to be a self-starter who thrives on working independently.

Typical Team

The team we visited is typical. HauptFeldwebel (Master Sergeant—HFw) Alfons Messner, team chief, has nearly 29 years of military service. Almost 17 of those were spent in various troop assignments or at the Engineer School in Munich. He has been a wallmeister for 12 years (the last 10 at his present location in central Germany) and expects to stay in his job for the remaining seven years until his retirement. The other sergeant was not present during our orientation visit. Since his 15-year enlistment term ends soon, he was on a job-hunting trip. The civilian driver has been with the team for four years and was a driver for the German Air Force before that. He is also an NCO in the Bundeswehr reserves. (As team drivers go, he is a relative newcomer. The driver for an adjacent wallmeister team has been driving for team members for just over 25 years.)

The modest team office consists of two rooms. One room is used by the team NCOs for paperwork and storing vast amounts of information. Plaques of appreciation for their support to various U.S. Army Engineer units on past exercises hang on the wall and are proudly pointed out to visitors. The other room is for the team driver and for the lockers in which they store extra clothing and equipment.

Members of a typical wallmeister team display their vehicle and equipment used to support their mission of territorial defense (photo courtesy of the German Military District Command (WBK) IV).

Introductory Briefing

HFw Messner enthusiastically gave us an overview briefing on his team's sector (which includes two counties in central Germany and follows their political boundaries), the types of obstacles found in it, obstacles being planned, demolitions storage sites, and how his team relates to the Territorial Command and can assist U.S. units.

He showed us copies of completed target folders for obstacles and explained the maps illustrating the target location, where its explosives are stored, routes between the storage site and target, cross-sectional drawings indicating where the explosive charges should be placed for optimal results, and blank forms used by the executing unit to report the extent of damage achieved. HFw Messner stated that in all cases the planned damage is the minimum amount required to produce an obstacle. Total destruction is not desired since it would considerably increase the time and cost necessary for the Germans to place the road or bridge back into use after hostilities. For each target he also maintains a folder outlining the target dimensions, estimated time and explosives needed to create the desired obstacle, and approximate cost to repair or replace the target.

He also showed us the engineer resource data books he maintains. These list local civilian firms which have such commodities as asphalt or concrete, lumber, gravel, or construction equipment.

Information on rivers and streams in his sector is also available to any unit for use in planning river crossings. Gathering this data integrates a curious mixture of modern technology (stream widths are measured using a sophisticated hand-held optical distance measurer) and basic Combat Engineering (stream velocity is commonly measured by throwing a stick into the stream and timing it over an estimated distance).

He told us that the team usually works in the office one day a week and travels the other four days checking various sites and updating information on engineer resources, waterway conditions, and target folder data. While there is no set schedule for these checks, his team normally visits each site in the sector at least monthly. During these visits, the team checks for damage or vandalism and also performs basic maintenance on the target demolition chambers or catwalks by greasing hinges or cleaning out accumulated dirt or rust. Only occasionally does he see his supervisor.

Most of their contact is by telephone or through his reports.

Team Van

Following the thorough office orientation on the duties of the wallmeister team, HFw Messner ushered us out to the team's transportation, an ordinary Volkswagen van that has been adapted by the team to support its work. The van has a worktable with drawers to serve as a field desk. Various hooks, boxes, and nooks hold the rest of the team's equipment—surveying stadia rod, measuring tapes, tools for removing demolition chamber covers, spare coveralls, wading boots, plus grease and cotton plugs to prevent water and dirt from clogging the demolition chamber cover openings. The van is a complete, yet compact, mobile work area organized with typical German precision.

Job Requirements

While the wallmeister is not assigned to the combat forces, his job not only requires close coordination with such forces, but makes him an unparalleled source of engineer information for Allied Nations as well as the Bundeswehr. For example:

- He must be an expert on the emplacement of obstacles in his sector to significantly assist in territorial defense.
- He must know the terrain and its tactical significance.
- He must know the types and capabilities of Bundeswehr munitions and equipment.
- He must know the local civilian sources of engineer resources in addition to any military sources within his sector.
- He must maintain a solid rapport with local political officials and civilian personnel involved with transportation systems, navigable waterways, power generation, communications, heavy construction, and industrial facilities within his sector.
- He must be familiar with the resources and planned obstacles in adjacent sectors.

In addition to being an information repository, the wallmeister assists Allied and Bundeswehr Engineers in planning obstacles—from site selection and determining the optimum type of obstacle to assisting in preparing necessary documentation for placing the target on a NATO list. If requested, wallmeisters normally will participate in unit field training exercises, lending their technical expertise and giving unit Engineers practical experience in coordinating host-nation support.

Typical Obstacles

During our visit, we were shown a stretch of public highway where a steel post obstacle can be installed quickly. With a river on one side and a steep slope on the other, this site appeared capable of being a very effective means of impeding enemy movement over the highway. Called a schachtsperr (beam post obstacle), the obstacle is created by placing steel I-beams (weighing nearly 500 pounds) into a prepared shaft in the roadway. The beam, rising nearly five feet above the road surface, is virtually impossible to remove from the shaft once emplaced, according to HFw Messner. In keeping with tactical doctrine, these shafts are built in rows, would have concertina wire placed among the beams and would be covered by fire. He explained that while this obstacle is more expensive to construct than demolition types, it is popular near urban areas since it is nonexplosive.

HFw Messner also showed us typical planned obstacle sites. We saw a railroad bridge and a highway bridge, each marked with the emplacement location for explosive charges to do effective, yet minimal damage to the structure. Each site has catwalks installed to assist troops in emplacing the charge and has routes marked for running the fuse or electrical wiring to the charge. We also saw a prechambered road crater site which is similarly engineered with a demolition chamber and fusing route requiring minimal troop time and effort to create an effective obstacle.

Demolition Storage

The wallmeister also monitors the storage of demolitions earmarked for barrier use. We were shown such a storage site, impressive not only for its size but also for the planning evident in the storage of the explosives themselves:

- All explosives and ancillary firing devices (blasting machine, fuse, detonating cord, and blasting caps) for a particular target are grouped together.
- Each grouping contains a complete inventory of the items stored for the target and a complete set of any tools a troop unit would need to gain access to the demolition chamber or target site and emplace the charges.
- The many types of explosives are clearly marked for rapid identification.
- A small forklift is stored in the bunker specifically for use by the troop unit in loading the explosives onto its vehicles.

A True Genie

This, then, is the wallmeister. He knows his sector, its terrain and resources, its planned obstacles, its people. He is a remarkable storehouse of information for any troop Engineer seeking his assistance. The French term for their military engineer is "genie." While the wallmeister may not be a genie in the fictional sense of an all-powerful spirit residing in a bottle or an Arabian lamp, he is a true genie (Engineer) in the military engineering sense and certainly must be considered a potential combat multiplier for any Engineer unit leader wise enough to tap the well of the wallmeister's extensive knowledge.

It was nearly noon when HFw Messner displayed one more aspect of his thorough sector knowledge—one that was not documented among his many files and folders. We headed for lunch in a gasthaus he considers to be the best in town.

LTC Robert H. McDonald is the Engineer Plans Officer for VII Corps. He served as S-3 and XO of the 94th Engineer Battalion (CBT)(HVY) in Germany. In addition to troop assignments in Germany and Korea, he has been an ROTC instructor at Clarkson College of Technology and a staff officer in the Directorate of Combat Developments, U.S. Army Engineer School.

He has completed Command and General Staff College and the Engineer Officer Basic and Advanced courses. He has bachelor's and master's degrees in civil engineering and is a registered professional engineer in Virginia.

Suggestions for further reading:

Gross, Dieter. "The Education and Mission of Demolition Engineers Today." *Die Wallmeister.* Munich: Wehrbereichskommando VI, 1983

Lechner, Anton. "The Wallmeister in History." *Die Wallmeister.* Munich: Wehrbereichskommando VI, 1983

Illustration of the Porta Nigra courtesy of the German Information Center, New York, NY.

Troop Construction in Korea

by LTC William D. Brown

With no designs available for firing positions, Engineers built and tested a prototype. The concrete firing pad was enlarged to accommodate self-propelled howitzers (photo by SP4 Tedric Garrison).

4P3 is an unlikely name for a troop construction project recently visited by the Chief of Engineers. Behind the unassuming title of 4P3 lies a most important effort to enhance the combat strength of the 2nd Infantry Division in Korea. An artillery fire support base, 4P3 is located just south of the Imjin River, only seven miles from North Korea. There, B Company, 44th Engineer Battalion (CBT) (HVY) completed what is perhaps the most interesting and challenging project undertaken this year in the 2nd Engineer Group.

B Company, commanded by CPT Don Curtis, deployed to 4P3 in March 1984 and bivouacked there in a tent city while constructing the facilities needed to support M-198 155mm howitzer batteries which will occupy the firebase on a rotational basis.

The complex includes six artillery firing positions, twelve wooden guard towers around the perimeter, three gate-guard buildings, ten 20×48-foot wood-frame billets, two latrines, a 40×64-foot dining facility, and a 20×48-foot administrative building. Other facilities, including two single-bay maintenance buildings, two fire direction control bunkers, interior roads and drainage, and perimeter fencing, were completed earlier under a CDIP (Combined Defense Improvement Program) initiative monitored by the Far East District.

While B Company was on site at 4P3, a great variety of challenges were met and overcome. The austere living conditions found the soldiers occupying G.P. medium tents from the very cold March weather to the rainy July conditions and on into the August heat, until the company moved into some of the just-completed billets. The nearest dining facility was at Camp Giant several miles away, while recreational facilities were even farther away.

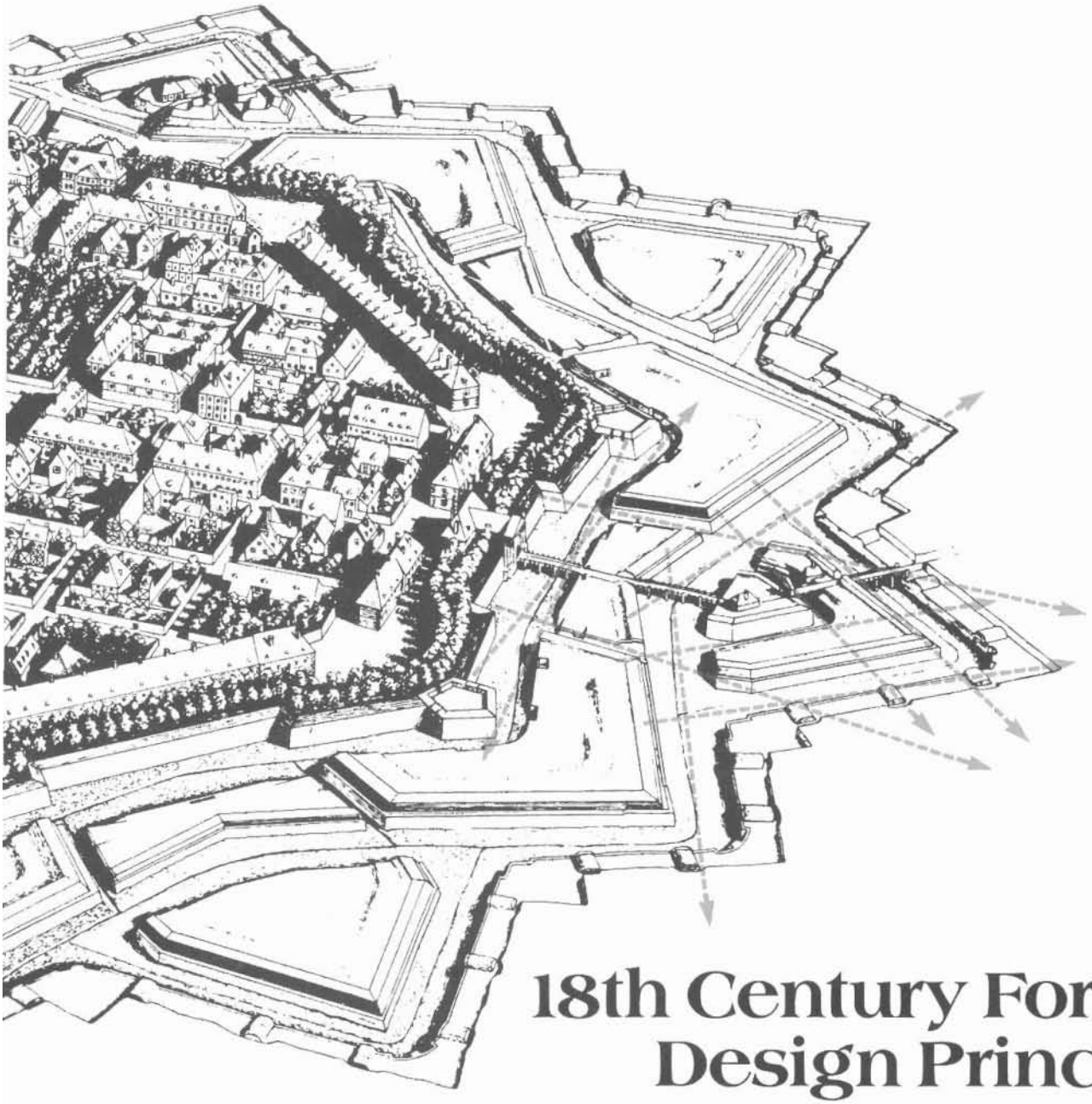
The construction itself was challenging since the company had no recent experience in this type of project. A design did not exist for the artillery firing positions. Thus, the platoon leaders and company commander, with the assistance of the battalion operations officer, prepared a design, built a prototype, and had the supported artillery battalion do a proof test with an M-198 155mm howitzer to verify the design. Based on this experience, the concrete firing pad was enlarged and the design modified to support self-propelled howitzers.

Flexibility and adaptability characterized other aspects of the construction as well. The standard theater-of-operations design for the guard towers would have required the guards to climb a ladder to reach the tower. Believing that an exterior stairway would make access easier and quicker, the 44th Engineer Battalion's S-3 design section modified the plans to accommodate a stairway, although this proved to be more complicated to build.

Engineer ingenuity was also required to find a way to place the concrete footers for several of the towers which were sited in areas inaccessible to wheeled vehicles. This problem was solved by using a D-7 bulldozer to very carefully tow the "old faithful" 16-S mixer into position to accomplish what the M-919 concrete mobile truck or commercial truck could not.

Although the project provided construction training and earned B Company recognition from the many visitors at the site, the company pushed hard to complete the remaining work on schedule, redeploy to its home base at Camp Nimble, and then immediately launch into its fall ARTEP. Once again, the men of the 44th Engineer "Broken Heart" Battalion lived up to their motto, *Builders of Freedom.*

LTC William D. Brown is the commander of the 44th Engineer Battalion (CBT)(HVY), Camp Mercer, Korea. He was a staff officer in the Program Analysis and Evaluation Directorate, Office, Chief of Staff, Army; Executive to the Chief of Engineers, OCE; and Executive Officer, 20th Engineer Battalion (CBT), Fort Campbell, KY. LTC Brown completed the Project Manager Course, the Defense Ssytems Management College, Command and General Staff College, and the Engineer Officer Advanced Course. He has graduate degrees in nuclear engineering from MIT and in operations research from George Washington University.



18th Century Fortress Design Principles

Antitank Ditch Systems

by MAJ Steven H. Myer and MAJ Jefferson J. Irvin

Illustration of Neuf Brisach is from **The History of Fortifications** *by Ian Hogg. Copyright 1982, St. Martin's Press Inc., New York.*

In *"History and Military Engineering Design: An 18th Century Example"* (Spring, 1985), we argued that the profile of an 18th century European fortification yielded some general principles applicable to obstacle design. The plan view of the same fortification also reveals some useful ideas. From a vantage point overhead, the baroque fortress appears as a series of detached fortifications projecting from an intact main perimeter. Each outer fortification and the main perimeter are protected by interconnected linear obstacles: the fortress ditch system.

This article first discusses the principles governing the layout of this ditch system, highlighting the inherent advantages of the linear obstacle. It then gives an example of how these advantages can be exploited in the design of antitank ditch systems for antiarmor defense.

Neuf Brisach (shown above) is one of of the border fortifications built for France during the reign of Louis XIV. (This fortification is an easy day's excursion from Karlsruhe or Stuttgart.) The main fortress perimeter is the polygon delineated by the double row of trees. Firing platforms for 24-pound cannon point outwards from the lines of trees. Beyond the main perimeter are the detached forts. The raised edges on the outer sides of these forts are also firing platforms for cannon.

The shaded areas between the forts and main perimeter comprise the ditch system. The ditch walls on the outer (towards the enemy) side of each ditch are 12 feet high. The walls on the inner side of the ditches, which generally lead vertically up to the raised gun platforms, are 30 feet high. The ditches were thus difficult to enter on the enemy side (a 12-foot drop) and virtually impossible to scale on the friendly side. The layout of these outer forts and

their encircling ditches was a strict geometric exercise directed towards maximizing the effectiveness of the linear ditch obstacles.

The portion of the fortification overview overmarked with defending artillery lines of fire shows the following:

1. Every ditch segment was directly enfiladed by a rearward or adjacent artillery platform. Cannonballs fired from this platform bowled along the ditch length, caroming off hard masonry ditch walls if fired slightly off line.

2. If an outer fortification was taken, there was a ditch behind that fortification, between it and the next rearward layer of forts. This ditch, like all ditches, was enfiladed by defensive fire. Because the outer forts were open to the rear and lower than the more inward forts, the outer gun platforms were themselves enfiladed by rearward, commanding fires. The enemy thus received no relief when he took an outer fort; he remained in crisscrossing zones of enfilading fire. The system was a rational series of linear obstacles in depth.

A brave enemy could storm the open area preceding the ditch system, betting against the ability of the defending infantry and artillery to hit isolated, scattered, moving targets. Once into the ditches, the attacker had a problem. He stood directly in the preset line of fire of defending cannon.

This is the significant advantage of a linear obstacle. It greatly reduces the difficulty of defensive target acquisition. The easiest example to cite as a modern equivalent is the deployment of barbed wire in infantry defense. We employ concertina directly along the final protective lines of machine guns.

Linear obstacles also aid in the modern antiarmor defense. We will first explain why minefields do not possess the advantages of linear obstacles, and in contrast why antitank ditches do. Then we will give a simple example exploiting the lessons of the 18th century fortress ditch system in the design of antitank ditch systems.

An effective minefield in an armor kill zone serves one major purpose: it forces enemy lead tanks to lower and use rollers and plows. This substantially slows the enemy column, prolongs the time the column spends in the kill zone, and allows more targets to be successfully engaged. The TOW gunner, however, must still search through a three-dimensional fan of fire for individual moving targets; and the enemy has some capacity to take evasive action moments before TOW missile impact.

A proper antitank ditch is designed like its 2½-century-old French counterpart. It is painful to enter and difficult to exit. The attacking tank must laboriously collapse the forward and rear ditch banks through time-consuming dozing and rocking motions. During this period of breach, if the ditch is aligned along TOW principal directions of fire, the TOW gunner is bowling along a lane in much the same manner as the artillerist on the late medieval French rampart.

The ditch need not be directly pointing towards the TOW position, as this would be an invitation for enemy artillery or air strikes. The ditches need only be aligned so the angle is within the TOW's main fan of fire. The ditch alone reduces the target search from three to two dimensions. The more the ditch alignment approaches the TOW direction of fire, the more the search becomes one dimensional, and the more the flank of the trapped tank is exposed. For the breaching period, the ditch fixes the moving target. There is no evasive action.

The following example of task force antiarmor defense in sector is taken from the *Antiarmor Handbook* published by the 7th Infantry Division in February 1982 (pages 3-1 to 3-10). The handbook discusses the considerations surrounding the choice of TOW and platoon positions and the designation of armor kill zones. These locations are shown in Figure 1. An antitank ditch

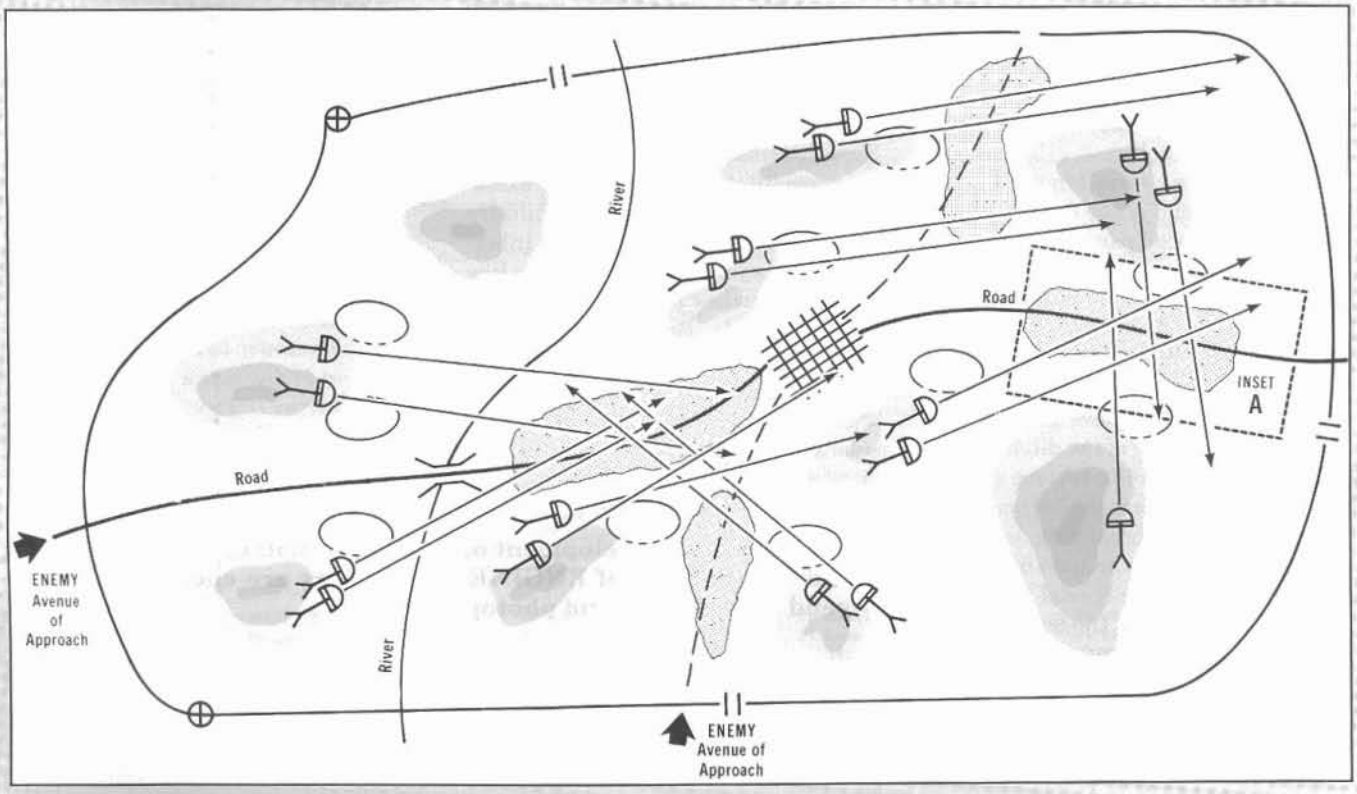


FIGURE 1. Overview of inset A (from Antiarmor Handbook)

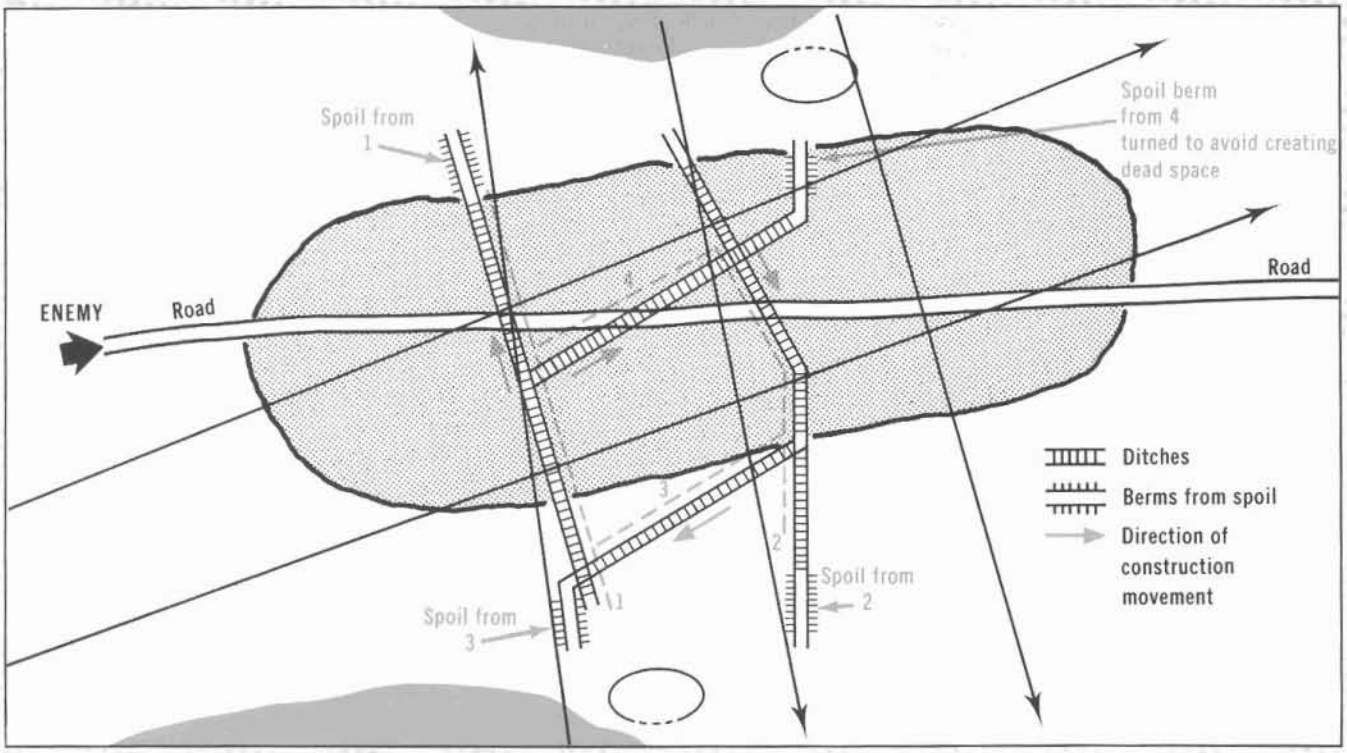


FIGURE 2. Close-up of inset A

system for the armor kill zone marked "A" is shown in a close-up in Figure 2. Note the following concerning the design of this system:

1. The rough pattern of the design is that of a pound sign, or crosshatching. This pattern has advantages in construction, as earthmovers can dig and dump in continuous loops. One set of 290M tractors can circuit, cutting ditches 3 and 4. Spoil berms are placed roughly parallel to defensive fires, creating no dead space, but forming additional obstacles.

An interesting variation would be to create at the end of the ditch segment two closely spaced parallel berms. The rearward berm would be higher than the forward, with the space between covered by enfilading fire. Tanks climbing over the first berm would plunge nose down into the base of the second: an antitank ditch above ground.

The leading edge of the ditch system should be sited on the reverse slope of a slight rise in terrain to mask the obstacle from approaching tanks. If this is not possible, the spoil from ditch segment 3 would be spread in front of the obstacle to mask the leading edge.

2. The crosshatching pattern is possibly broken (Figure 2) and oriented slightly askew from the lines of fire of intersecting pairs of TOWs. As mentioned before, this prevents the use of ditch orientation as a pointer to TOW locations.

3. The crosshatching creates "detached forts" in a manner similar to the 18th century pattern. Once the first ditch is breached, a second and possibly third ditch segment must be breached. The observant enemy tank commander would head for the ditch segment intersections to avoid multiple ditch breaches. These areas of intersection would be saturation mined.

This article serves several purposes. First, it demonstrates that history provides useful, frequently simple examples of the application of basic military principles. Second, it shows the inherent advantages of linear obstacles like antitank ditches over area obstacles like minefields. Both slow down the enemy, but the linear obstacle fixes the enemy along lines of fire. This advantage is worth the expenditure of considerable additional effort. Finally, it gives a simple procedure for basic antitank ditch pattern design, along the lines of logic defined by the French in the early 1700s.

MAJ Steven H. Myer is an assistant professor of mathematics at the U.S. Military Academy and served as a platoon leader in the 1/27th Infantry Battalion, 25th Infantry Division in Hawaii. He was company commander, 1/504th Infantry and assistant G-3 OPS in the 82nd ABN Division at Fort Bragg, NC. MAJ Myer has a bachelor's degree from the U.S. Military Academy and a master's degree from Stanford University.

MAJ Jefferson J. Irvin is an assistant professor of geography and computer science at the U.S. Military Academy. He served as a platoon leader and company commander in the 94th Engineer Battalion in Germany. MAJ Irvin has a bachelor's degree from the U.S. Military Academy and a master's degree from Stanford University.

Professional Development of Engineers will be the theme of the Winter issue of ENGINEER. Readers are encouraged to send manuscripts and photographs to:

ENGINEER Magazine
ATTN: ATZA-TD-P, Stop 291D
Fort Belvoir, VA 22060-5291

Engineer Command Update

ACTIVE ARMY

7th Engineer Brigade
Kornwestheim, Germany
COL Jim Velezis
CSM Harold Lane

18th Engineer Brigade
Karlsruhe, Germany
COL Carl Magnell
CSM Harold Thomas

20th Engineer Brigade (C)(ABN)
Ft. Bragg, NC
COL Bob Howard
CSM Acie Gardner

130th Engineer Brigade
Hanau, Germany
COL Boyd Jones
CSM Billie Spearman

2nd Engineer Group
Camp Coiner, Korea
COL Ernie Harrell
CSM James Brown

36th Engineer Group
Ft. Benning, GA
COL Paul Chinen
CSM Ernest Farley

937th Engineer Group
Ft. Riley, KS
COL Jerry Hubbard
CSM Felomino Orita

1st Engineer Bn., 1st Inf. Div.
Ft. Riley, KS
LTC Jerry Sinn
CSM Alvis Poe

2nd Engineer Bn., 2nd Inf. Div.
Camp Casey, Korea
LTC Ron Dabberi
CSM James Stevens

3rd Engineer Bn., 24th Inf. Div.
Ft. Stewart, GA
LTC Hank Miller
CSM John Finnie

4th Engineer Bn., 4th Inf. Div.
Ft. Carson, CO
LTC Dick Johns
CSM Kermit Birchfield

5th Engineer Bn. (CBT)(CORPS)
Ft. Leonard Wood, MO
LTC Roger Lorber
CSM Otha Ellis

7th Engineer Bn., 5th Inf. Div.
Ft. Polk, LA
LTC John Behrens
CSM Robert Strickland

8th Engineer Bn., 1st Cav., Div
Ft. Hood, TX
LTC Steve Page
CSM George Ramirez

9th Engineer Bn., (CBT)(CORPS)
Aschaffenburg, Germany
LTC Pete Hines
CSM Donald Schmidt

10th Engineer Bn., 3rd Inf. Div.
Kitzingen, Germany
LTC Russ Furhman
CSM Dennis Watters

11th Engineer Bn., (CBT)(HVY)
Ft. Belvoir, VA
LTC Charles J. Mills
CSM William Crisp

12th Engineer Bn., 8th Inf. Div.
Dexheim, Germany
LTC Carl Jensen
CSM Colin Hargrove

13th Engineer Bn., 7th Inf. Div.
Ft. Ord, CA
LTC Mike Kuehn
CSM Roscoe Harshaw

14th Engineer Bn. (CBT)(CORPS)
Fort Ord, CA
LTC George Meador
CSM James Coley

15th Engineer Bn., 9th Inf. Div.
Ft. Lewis, WA
LTC Mike Norris
CSM John Ramsey

16th Engineer Bn., 1st Armd. Div.
Furth, Germany
LTC Robert J. Greenwalt
CSM Dallas Bailey

17th Engineer Bn., 2nd Armd. Div.
Ft. Hood, TX
LTC Pete Sowa
CSM Marvin Williams

19th Engineer Bn. (CBT)(CORPS)
Ft. Knox, KY
LTC Jim Gnage
CSM Langford Clay

20th Engineer Bn. (CBT)(CORPS)
Ft. Campbell, KY
LTC Gary Morgan
CSM Tom Singleton

23rd Engineer Bn., 3rd Armd. Div.
Hanau, Germany
LTC Dick Kanda
CSM Donnie Stoneking

27th Engineer Bn. (ABN)
Ft. Bragg, NC
LTC Mike Diffley
CSM George Shaw

29th Engineer Bn. (TOPO)
Ft. Shafter, HI
LTC Bob Kerby
CSM Robert Marshall

30th Engineer Bn. (TOPO)
Ft. Belvoir, VA
LTC Gene Hazel
CSM John Sewell

34th Engineer Bn. (CBT)(HVY)
Ft. Riley, KS
LTC Jim Lyles
CSM James Mangram

39th Engineer Bn. (CBT)(CORPS)
Ft. Devens, MA
LTC Philip Shoemaker
CSM Donald Boxall

43rd Engineer Bn. (CBT)(HVY)
Ft. Benning, GA
LTC Rick Shuler
CSM Edmund Armstrong

44th Engineer Bn. (CBT)(HVY)
Camp Mercer, Korea
LTC Doug Brown
CSM Delnora Rector

46th Engineer Bn. (CBT)(HVY)
Ft. Rucker, AL
LTC Hamp Conley
CSM Douglas Harris

52nd Engineer Bn. (CBT)(HVY)
Ft. Carson, CO
LTC Mike Collmeyer
CSM Bernd Dela-Cruz

54th Engineer Bn.
Wildflecken, Germany
LTC Jack MacNeil
CSM Arthur Browning

62nd Engineer Bn. (CBT)(HVY)
Ft. Hood, TX
LTC Mike Thuss
CSM Robert Sullivan

65th Engineer Bn., 25th Inf. Div.
Schofield Bks, HI
LTC Phil Carroll
CSM Matthew Lee

76th Engineer Bn. (CBT)(HVY)
Ft. Drum, NY
LTC Bill Traubel
CSM Charles Adams

78th Engineer Bn. (CBT)(CORPS)
Ettleingen, Germany
LTC John Wildenberg
CSM William Cleveland

79th Engineer Bn. (CBT)(HVY)
Karlsruhe, Germany
LTC Jess Gatlin
CSM Ivan Wentworth

82nd Engineer Bn. (CBT)(CORPS)
Bamberg, Germany
LTC Jim Craig
CSM Merlyn Pence

84th Engineer Bn. (CBT)(HVY)
Schofield Bks, HI
LTC Denny Cochrane
CSM Preston Thompson

92nd Engineer Bn. (CBT)(HVY)
Ft. Stewart, GA
LTC Floyd Griffin
CSM Irones Bryant

94th Engineer Bn. (CBT)(HVY)
Darmstadt, Germany
LTC Joe Larremore
CSM Wash Knoten

237th Engineer Bn. (CBT)(CORPS)
Heilbronn, Germany
LTC John Pierce
CSM Joseph Oliver

249th Engineer Bn. (CBT)(HVY)
Knielingen, Germany
LTC Mel Lynch
CSM Eugene Roberts

293rd Engineer Bn. (CBT)(HVY)
Balmholder, Germany
LTC John Glass
CSM Edward Price

299th Engineer Bn. (CBT)(CORPS)
Ft. Sill, OK
LTC Jim VanEpps
CSM Franklin Zorn

307th Engineer Bn., 82nd Abn. Div.
Ft. Bragg, NC
LTC Bob Flowers
CSM Bobby Ewell

317th Engineer Bn. (CBT)(CORPS)
Eschborn, Germany
LTC Jim Cooper
CSM James Terrell

326th Engineer Bn. (CBT)(AVLB)
Ft. Campbell, KY
LTC Jeff Wagonhurst
CSM Walton Woodall

536th Engineer Bn.
Panama
LTC Larry Winchester
CSM John Lobash

547th Engineer Bn. (CBT)(CORPS)
Darmstadt, Germany
LTC Steve Winsor
CSM Robert Thames

548th Engineer Bn. (CBT)(HVY)
Ft. Bragg, NC
LTC Bruce Malson
CSM Clarence Blackburn

549th Engineer Bn (SVC)
Schwetzingen, Germany
LTC Dan Waldo
CSM David Moore

559th Engineer Bn. (COMP)
Hanau, Germany
LTC Billy Ricks
CSM Richard Wilson

565th Engineer Bn. (COMP)
Nevrevt, Germany
LTC John Mills
CSM Kenneth Wojczynski

588th Engineer Bn. (CBT)(HVY)
Ft. Lewis, WA
LTC Wayne Murphy
CSM Thomas Carr

649th Engineer Bn. (TOPO)
Schwetzingen, Germany
LTC Samuel Schwartz
CSM Robert Turner

Composite Engineer Bn.
Ft. Bragg, NC
LTC Tim Pratt
CSM Wade Gattes

802nd Engineer Bn. (CBT)(HVY)
Camp Humphries, Korea
LTC Robert Froude
CSM Sam Moore

TRADOC

Engineer School Bde.
Ft. Belvoir, VA
COL George LaBlonde
CSM Robert MacKissock

2nd AIT Bde.
Ft. Leonard Wood, MO
COL Leo Holland
CSM Vernon Allen

3rd AIT Bde.
Ft. Leonard Wood, MO
COL James E. Brayboy
CSM Leroy N. Mello

4th AIT Bde.
Ft. Leonard Wood, MO
COL Fred Edwards
CSM Russell E. Fultz

SPT Bde.
Ft. Leonard Wood, MO
COL Jude Patin
CSM Eugene A. Rasmussen

1st Bn., 2nd Bde.
Ft. Leonard Wood, MO
LTC Dick Hoover
CSM Edward O. Strunge

2nd Bn., 2nd Bde.
Ft. Leonard Wood, MO
LTC Jim Raymond
CSM Roy Duffield

4th AIT Bn., 2nd Bde.
Ft. Leonard Wood, MO
LTC Don Holzwarth
CSM James Williams

2nd AIT Bn., 4th Bde.
Ft. Leonard Wood, MO
LTC Tom Jacobus
CSM Timothy E. Arnold

3rd Engineer Bn., 4th Bde.
Ft. Leonard Wood, MO
LTC Jim Jenkins
CSM Domer Richter

TRADOC CONTINUED

4th Engineer Bn., 4th Bde.
Ft. Leonard Wood, MO
LTC Dave Lindsay
CSM Paul Fulwood

2nd Bn., 3rd Bde.
Ft. Leonard Wood, MO
LTC Hal Alvord
CSM Wayne A. Utley

5th Bn., 3rd Bde.
Ft. Leonard Wood, MO
LTC Bill Boutin
CSM Roy C. Burton

1st Engineer Bn., USAESB
Ft. Belvoir, VA
LTC John Carey
CSM Joseph C. Alexander

3rd Engineer Bn., USAESB
Ft. Belvoir, VA
LTC Al Jansen
CSM Jerry Coughill

NATIONAL GUARD

ALABAMA

1169th Engineer Group
(CBT)(CORPS)
Huntsville, AL
COL Andrew J. Heritage
CSM Frank M. Birmingham

145th Engineer Bn.
Centreville, AL
LTC Joseph A. Harris
CSM Alex M. Latham

151st Engineer Bn. (CBT)(CORPS)
Fort Payne, AL
LTC David E. Powell Jr.
CSM Robert T. Turner

877th Engineer Bn. (CBT)(HVY)
Hamilton, AL
LTC John A. Nichols III
CSM Norman K. Emerson

1203rd Engineer Bn. (TOPO)
Dothan, AL
LTC Dwight W. Tew
CSM Marion M. Spivey

1343rd Engineer Bn. (CBT)(CORPS)
Athens, AL
LTC Joel N. Pugh
CSM Billy G.Swanner

31st Engineer Co.
Fayette, AL
MAJ John F. Parker
1SG Jesse C. Rainey

166th Engineer Co. (AFB)
Centreville, AL
CPT Jackson W. Pow
1SG John N. Nichols Jr.

167th Engineer Co. (AFB)
Demopolis, AL
CPT Arthur D. Evans
1SG Joseph A. Langford

168th Engineer Co.
Eutaw, AL
CPT Jeffrey Clary
1SG Bennie L. Abrams

1204th Engineer Co. (CARTO)
Slocomb, AL
CPT Otis Corbin Jr.
1SG David H. Avery

1205th Engineer Co. (SURVEY)
New Brockton, AL
CPT James M. Morris
1SG Charles E. Goodson

ARIZONA

258th Engineer Co. (CSE)
Phoenix, AZ
CPT Thomas T. Galkowski
1SG Thomas Matthew

259th Engineer Co. (CSE)
Phoenix, AZ
CPT David Freeland
1SG Bruce Ward

ARKANSAS

875th Engineer Bn. (CBT)(CORPS)
Jonesboro, AR
LTC William L. Stanley
CSM Charles T. Purvis

239th Engineer Co.
Clarksville, AR
MAJ Ronald S. Chastain
1SG James A. Carter

CALIFORNIA

132nd Engineer Bn.
Sacramento, CA
LTC Ronald W. Cross
CSM Gerry D. Keese

579th Engineer Bn. (CBT)(CORPS)
Santa Rosa, CA
LTC Jerrold L. Jurrin
CSM John David

112th Engineer Co.
Chico, CA
CPT Michael F. Hau
1SG John Whittier

CONNECTICUT

192nd Engineer Bn.
Putnam, CT
MAJ Richard E. Blake
CSM Gerald S. Bennett

242nd Engineer Bn. (CBT)(CORPS)
Stratford, CT
MAJ Joseph T. Wojtasik
CSM John Bodnar III

248th Engineer Co.
Norwich, CT
CPT Carl A. Blackstone
1SG John J. Sigersmith III

250th Engineer Co. (MGB)
Danielson, CT
1LT Richard A. Donais
1SG Joseph O. Gadbois

FLORIDA

153rd Engineer Co.
Lake City, FL
MAJ Richard G. Donoghue
1SG Richard T. Patterson

269th Engineer Co.
Live Oak, FL
CPT Ronald T. Duguid
1SG James G. Gaskins

GEORGIA

265th Engineer Group
Marietta, GA
COL John R. Paulk
CSM King D. Laviner

560th Engineer Bn.
Columbus, GA
LTC Benjamin W. Grinstead
CSM Morris E. Stafford

878th Engineer Bn. (CBT)(HVY)
Augusta, GA
LTC Thomas R. Williams
CSM Donald L. Hartley

1148th Transportation Co.
Augusta, GA
CPT Bobby J. Donaldson
1SG Wayne E. Henderson

HAWAII

227th Engineer Co.
Honolulu, HI
CPT Kerry K. Oshiro
1SG James Ilae Jr.

IDAHO

116th Engineer Bn. (CBT)(CORPS)
Lewiston, ID
MAJ Michael P. Whiles
CSM Gordon J. Hubbard

248th Engineer Bn.
Idaho Falls, ID
LTC Forrest P. Hanson
CSM Clifford C. Carlson

129th Engineer Co.
Payette, ID
CPT Randy J. Dillon
1SG Fredrick J. Egurrola

ILLINOIS

233rd Engineer Co.
Joliet, IL
MAJ John G. Zupancic
1SG Harlow A. Peues

INDIANA

113th Engineer Bn.
Valparaiso, IN
LTC Charles F. Burns
CSM (Vacant)

1313th Engineer Co.
Edinburgh, IN
1LT James A. Fritsche
CSM Ancil D. Ballinger

IOWA

224th Engineer Bn.
Fairfield, IA
MAJ Roger C. Roskens
CSM Dale L. Blodgett

KANSAS

891st Engineer Bn. (CBT)(CORPS)
Iola, KS
MAJ James E. Lee
CSM Chester C. Johnston

KENTUCKY

201st Engineer Bn. (CBT)(CORPS)
Ashland, KY
MAJ Bruce W. Pieratt
CSM Edwin F. Conley

LOUISIANA

225th Engineer Group (CONST)
Cape Beauregard, LA
COL Charles Lindsay
CSM Riley Woods

205th Engineer Bn. (CBT)(HVY)
Bogalusa, LA
LTC Wilson Maloz Jr.
CSM Howard Jordan

527th Engineer Bn. (CBT)(HVY)
Bossier City, LA
LTC Charles M. Partin
CSM Robert Bott

528 Engineer Bn. (CBT)(HVY)
Monroe, LA
LTC Edmund Giering III
CSM Fred Lindsay

769th Engineer Bn. (CBT)(HVY)
Baton Rouge, LA
LTC Fred Palmer
CSM Clarence Thibodeaux

2223rd Engineer Bn. (MAINT)
Baton Rouge, LA
LTC Donald Bringol
CSM Earl Picard

256th Engineer Co.
Opelousas, LA
CPT Michael Richardson
1SG Herbert Prudhomme

2228th Engineer Co.
Bunkie, LA
CPT Joseph Kutch
1SG Roger D. Sv-an

MAINE

240th Engineer Group
Waterville, ME
COL Roscoe Tibbetts
CSM Raymond A. Young

133rd Engineer Bn.(CBT)(HVY)
Portland, ME
MAJ Donald Laflin
CSM Fred Desarno

262nd Engineer Bn.
Bangor, ME
LTC Norman Giroux
CSM Richard Graves

MARYLAND

121st Engineer Bn. (CBT)(CORPS)
Ellicott City, MD
LTC Maurice W. Partin
CSM John H. DuVall Jr.

MASSACHUSETTS

101st Engineer Bn.
Reading, MA
LTC John J. Hannon
CSM Paul S. Rouillard

181st Engineer Co. (CSE)
Whitman, MA
CPT Brian E. Gilmore
1SG David B. Martin

MICHIGAN

46th Engineer Group
Flint, MI
COL Elon M. Pearson
CSM David R. Daly

107th Engineer Bn.
Ishpeming, MI
LTC James P. Dougovito
CSM William A. Eckloff

207th Engineer Bn.
Bay City, MI
MAJ Michael L. Paluda
CSM (Vacant)

507th Engineer Bn.
Wyoming, MI
LTC Edward E. Eckart
CSM Dale A. DeMarr

1432nd Engineer Co. (MGB)
Wyoming, MI
1LT Marvin R. Deur
1SG Donald J. Roberts

1433rd Engineer Co.
South Haven, MI
CPT Dennis L. Knappen
1SG Alfred L. Edmonds

1435th Engineer Co.
Bay City, MI
CPT James R. Anderson
1SG Phillip A. Wagner

1436th Engineer Co.
Muskegon, MI
CPT Edwin S. Braden
1SG Joseph R. Schwartz

1437th Engineer Co. (AFB)

Sault Ste Marie, MI
CPT Robert H. Beauprey Jr.
1SG Howard G. Sanderson

MINNESOTA

682nd Engineer Bn.
Roseville, MN
LTC Kurt H. Hoehne
CSM Allan K. Knutson

MISSISSIPPI

168th Engineer Group
Vicksburg, MS
COL Jerry Keeton
CSM Marvin Smith

223rd Engineer Bn. (CBT)(HVY)
West Point, MS
LTC Dennis Self
CSM Royce E. Fulgham

890th Engineer Bn. (CBT)(HVY)
Gulfport, MS
LTC Woodrow Lyon
CSM Barnard A. Harrington

MISSOURI

35th Engineer Bde.
Jefferson Barracks, MO
BG Waylen E. Jobe
CSM Claude J. Huskey

135th Engineer Group
Cape Girardeau, MO
COL Robert A. Harry
CSM Herschel L. Hunt

110th Engineer Bn.
Kansas City, MO
LTC Harlan L. Hess
CSM Sherman Todd

203rd Engineer Bn. (CBT)(HVY)
Joplin, MO
LTC Andrew J. Hager Jr.
CSM Philip H. Chew

880th Engineer Bn.
Jefferson Barracks, MO
LTC Donald R. Sievers
CSM Harold V. Munson

1138th Engineer Bn.
Jefferson Barracks, MO
COL Ronald Weiscopff
CSM William Leeper

1140th Engineer Bn.
Cape Girardeau, MO
COL David R. Moll
CSM Paul R. Summers

220th Engineer Co.
Jefferson Barracks, MO
CPT Norman D. Charleville
1SG Guy N. Swiger

1438th Engineer Co.
Rolla, MO
CPT Paul E. Monda
1SG William B. Formy-Duval

MONTANA

1063rd Engineer Co.
Missoula, MT
MAJ Maurice W. Anding
1SG Jerry A. Jones

NEBRASKA

867th Engineer Co.
Ashland, NE
MAJ Richard L. Robinson
1SG William L. Smith

NEW JERSEY

104th Engineer Bn.
Teaneck, NJ
LTC Thomas J. McCaffery
CSM Robert B. Beling

NEW YORK

221st Engineer Group
Buffalo, NY
COL Daniel B. Tauriello
CSM George M. Brill

102nd Engineer Bn.
New York, NY
LTC Robert J. Guarneri
CSM Joseph R. Bernardo

152nd Engineer Bn.(CBT)(CORPS)
Buffalo, NY
MAJ Stanley M. Koren
CSM James L. Schauger

204th Engineer Bn. (CBT)(HVY)
Binghampton, NY
LTC Richard S. Fidurski
CSM Thomas J. Scalise

NORTH CAROLINA

30th Engineer Bde. (CBT)(CORPS)
Charlotte, NC
BG Furman P. Bodenheimer Jr.
CSM Fred E. Hudson

105th Engineer Group
Winston-Salem, NC
COL Harvey L. Poole
CSM John P. Martin

505th Engineer Bn. (CBT)(HVY)
Gastonia, NC
LTC James W. Emerson
CSM Marshall B. Willis

881st Engineer Co.
Rockingham, NC
MAJ Thomas R. Curtis
1SG Major B. Brown

OHIO

16th Engineer Bde. (CBT)(CORPS)
Columbus, OH
BG Ronald Bowman
CSM Lawerence Mead

134th Engineer Group
(CBT)(CORPS)
Hamilton, OH
COL Jack D. Arnett
CSM James T. Dougherty

416th Engineer Group
(CBT)(CORPS)
Walbridge, OH
COL Richard F. Mueller
CSM Carl S. Bicanovsky

112th Engineer Bn. (CBT)(CORPS)
Brook Park, OH
LTC Louis V. Leo
CSM Clarence W. Smith

216th Engineer Bn. (CBT)(CORPS)
Portsmouth, OH
LTC Lynn V. Coriell
CSM Larry D. Rase

372nd Engineer Bn. (CBT)(CORPS)
Kettering, OH
LTC Roger E. Rowe
CSM Thomas G. Brown

512th Engineer Bn.
Cincinnati, OH
MAJ Chester Lewis
CSM Albert F. Spiller

612th Engineer Bn. (CBT)(CORPS)
Walbridge, OH
LTC Vivan Duffy
CSM James A. Robarge

26th Engineer Co. (ACR)
Brook Park, OH
CPT Timothy J. Harmon
1SG Richard Gadke

OKLAHOMA

120th Engineer Bn. (CBT)(HVY)
Okmulgee, OK
LTC Alfred F. Westrope
CSM Larry E. Edmonston

245th Engineer Co.
Muskogee, OK
CPT William D. Fillman Jr.
1SG Eugene N. Foster

OREGON

1249th Engineer Bn. (CBT)(CORPS)
Salem, OR
LTC Fred R. Flint
CSM Donald W. Knapp

162nd Engineer Co.
Lake Oswego, OR
CPT William V. Clement
1SG Robert M. Cule

PENNSYLVANIA

103rd Engineer Bn.
Philadelphia, PA
LTC James J. DiBella
CSM John F. Hoke

876th Engineer Bn. (CBT)(CORPS)
Johnstown, PA
LTC Charles Bechtel
CSM Terry L.Lienhardt

PUERTO RICO

130th Engineer Bn. (CBT)(CORPS)
Camp Tortuguero
Vega Baja, PR
MAJ Emilio Diaz-Colon
CSM Angel Birriel

RHODE ISLAND

243rd Engineer Bn.
Warwick, RI
MAJ James T. Dunn
CSM Jean T. Vanti Jr.

861st Engineer Co.
East Greenwich, RI
CPT Herbert J. Andrade
1SG Ronald A. Cunha

1118th Engineer Co.
Woonsocket, RI
CPT Albert Guarnieri Jr.
1SG Arthur W. O'Rourke

SOUTH CAROLINA

122nd Engineer Bn.
Edgefield, SC
MAJ Frank H. Chapman
CSM Donald G. Robinson

122nd Engineer Co.
Saluda, SC
1LT William C. Derrick
1SG Kenneth D. Miller

125th Engineer Co.
Camden, SC
CPT Xanthan W. Polk
1SG Jerry W. Strawbridge

SOUTH DAKOTA

109th Engineer Group
Rapid City, SD
COL Richard P. Gross
CSM John W. Mechling

109th Engineer Bn.
Sturgis, SD
LTC Robert D. Daane
CSM Norman L. Pudwill

137th Engineer Bn.
Wagner, SD
LTC Lawrence L. Weiss
CSM James L. Selers

153rd Engineer Bn.
Huron, SD
LTC Robert M. Benson
CSM Robert L. Stratton

200th Engineer Co. (ABR)
Chamberlain, SD
CPT Michael J. Dacy
1SG Ronald E. Globke

211th Engineer Co. (MGB)
Lemmon, SD
CPT Harold D. Irland
1SG John Jund Jr.

214th Engineer Co.
Hot Springs, SD
CPT David A. Oerlline
1SG Phillip G. Knapp

842nd Engineer Co. (CSE)
Spearfish, SD
1LT Charles R. Gray
1SG Harold D. Haivala

854th Engineer Co.
Wagner, SD
CPT Norbert L. Mohnen
1SG Vernon J. Sip

TENNESSEE

194th Engineer Bde.
Nashville, TN
BG Lytle Brown III
CSM Billy J. Law

230th Engineer Bn.
Martin, TN
LTC Allen Strawbridge
CSM Samuel J. Fugua

155th Engineer Co.
Waverly, TN
CPT Robert M. Stooksberry
1SG Charles Cullum

212th Engineer Co. (CBT)(HVY)
Monteagle, TN
CPT Larry L. Owens
1SG C. D. Fenstermacher

913th Engineer Co.
Union City, TN
CPT Terry M. Smyth
1SG Frank L. Mandrell

2998th Engineer Co.
Martin, TN
CPT Ken R. Parks
1SG Joseph D. Smith

TEXAS

111th Engineer Bn.
Abilene, TX
LTC Clifford B. Barkley
CSM Tommy W. Ivison

386th Engineer Bn. (CBT)(CORPS)
Houston, TX
LTC Alvin J. Haley
CSM Eston L. Boehm

VERMONT

45th Engineer Co.
Rutland, VT
CPT Paul M. Liberty
1SG Robert F. Knight

131st Engineer Co. (CSE)
Burlington, VT
CPT Dale R. Norton
1SG John J. McCarthy

VIRGINIA

176th Engineer Group
Richmond, VA
COL Thomas T. Thompson
CSM Gay W. Davis

276th Engineer Bn.
Richmond, VA
LTC Larry E. Gilman
CSM James C. Bishop Jr.

1030th Engineer Bn.
Gate City, VA
MAJ Claude A. Williams
CSM Billy T. Gilreath

237th Engineer Co.
Fredericksburg, VA
CPT Kenneth E. Lankey Jr.
1SG Winston Ward

1031st Engineer Co.
Gate City, VA
CPT Robert L. Sparks
1SG Billy Larke

WASHINGTON

286th Engineer Co.
Bellingham, WA
MAJ Donald L. Adderley
1SG Arnold H. Wahl

WEST VIRGINIA

111th Engineer Group
Saint Albans, WV
COL Eldridge R. Casto Jr.
CSM Joseph J. Sale Jr.

1092nd Engineer Bn. (CBT)(CORPS)
Parkersburg, WV
LTC John R. Mathews
CSM Denver L. Guthrie

119th Engineer Co. (CSE)
Clarksburg, WV
CPT James B. Henderson
1SG John H. Sandy

193rd Engineer Co.
Oak Hill, WV
CPT William H. Miller
1SG Thomas M. Powell

WISCONSIN

264th Engineer Group
Eau Claire, WI
COL Michael L. Downey
CSM Palmer Johnson Jr.

426th Engineer Bn.
Onalaska, WI
LTC James Nelson
CSM Willis B. Fernholtz

724th Engineer Bn. (CBT)(CORPS)
Superior, WI
MAJ Robert G. Treland
CSM Thomas L. Meronek

32nd Engineer Co.
Onlaska, WI
CPT Wayne E. Wright
1SG Richard Roth

229th Engineer Co.
Prairie du Chien, WI
CPT Wayne D. Sharp
1SG Gerald J. Zuhlsdorf

273rd Engineer Co.
Onalaska, WI
CPT Bill G. Koch
1SG James E. Schwaegerl

WYOMING

133rd Engineer Co. (CSE)
Laramie, WY
CPT Martin R. Gill
1SG Wayne Anderson

The names of the commanders and command sergeants major for all active units were obtained from MILPERCEN. Information on National Guard units was supplied by individual states. The Army Reserve Command Update is scheduled for the Fall issue. Readers are encouraged to send any additional information to ENGINEER.

Commissioned Officers' Branch

Revised OPMS:

The revised Officer Personnel Management System (OPMS) will gradually change the officer corps from a dual specialty system to one in which officers will be managed, developed, and promoted by branch and/or functional area. The revised OPMS will affect many facets of the current system.

One major change will be the consolidation of multiple specialties into a single branch (Figure 1). For the Engineer community, that equates to converting specialty codes 22 and 23 to "areas of concentration" within Engineer Branch.

NEW DESIGNATION		PREVIOUS DESIGNATION	
General Engineer	21A	21K	General Engineer
		21G	General Army Support Engineer
Combat Engineer	21J	21A	Combat Engineer
		21B	Construction Engineer
		21E	Battlefield Support Engineer
		21J	Combat Engineer
Topographic Engineer	21C	21D	Topographic Engineer
		22A	Topographic Engineer
Construction Engineer	21D	21C	Engineer Management Officer
		21F	Garrison Support Engineer
		21H	Specialized Support Engineer
		23A	Facility Management Engineer
		23B	Contract Construction Management Engineer

Figure 1. Evolution of Engineer Specialty Codes.

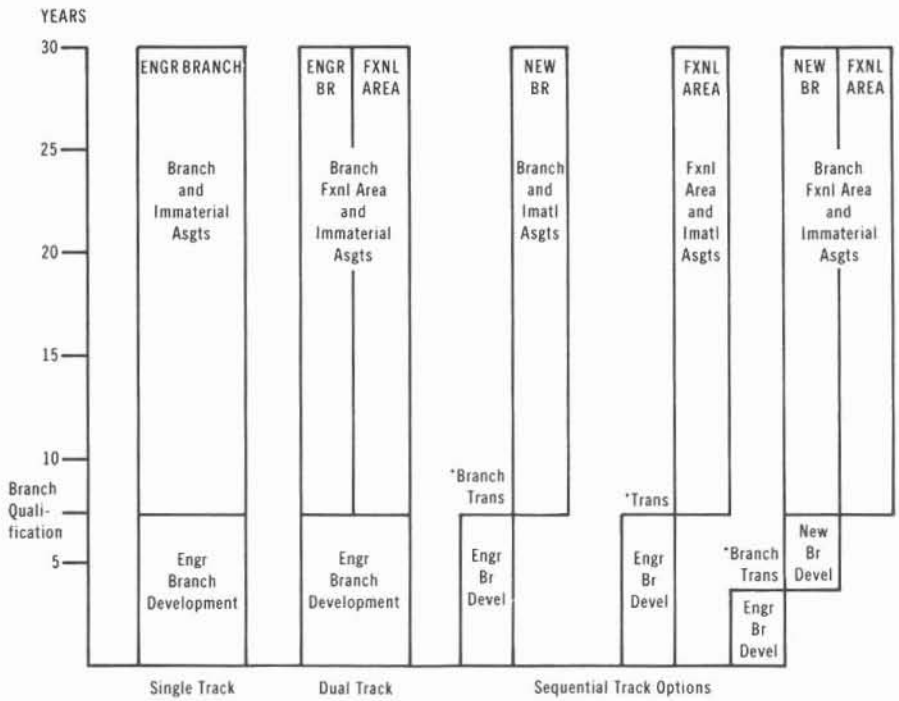
As outlined in *Commanders Call* (October 1984), major features of the revised system include:

- One branch per officer.
- Multiple career paths (single, dual, and sequential).

Many Engineer officers will single track within Engineer Branch. To provide the flexibility to develop individual officers within their abilities and to meet the Army's and the Corps of Engineers' needs, some Engineer officers will also be developed in a functional area by either dual or sequential tracking (Figure 2).

The officers under the current OPMS (generally senior captains and field grade officers) will be grandfathered if they are equally qualified in both of their currently held specialties. This means that, for example, an officer who holds specialties 21 and 53—and is determined to be qualified in both—will retain those specialties.

- Officers qualified in specialties 21 and 23, or 21 and 22, will single track in Engineer Branch, as they currently are doing, and retain classification code 21.
- Officers not qualified in their currently designated additional specialty may be able to single track within Engineer Branch, dual track by selecting another functional area, or sequentially track and serve in



NOTES: 1. Branch includes assignments and development in one or more areas of concentration.
2. Branch immaterial (USAREC, ROTC, Instructor, Protocol, IG, OESO, Community Commander) - All Branches.
3. Combat Arms immaterial (Reserve Advisor, Chief of Staff, Instructor) - IN, AD, AV, AR, FA, EN.
4. Logistics immaterial (Logistics Officer, G-4, Instructor, Reserve Advisor) - OD, QM, TC.
* These transfers do not necessarily occur at only the 7 and 3 year points, but are shown here for illustration.

Figure 2. Typical Career Patterns for Engineer Officers Under Revised OPMS.

only a functional area as their qualifications and Army requirements permit.

- Some officers currently holding specialties in two branches may retain both or be designated into a single area of concentration within the second branch. For example, an officer qualified as a 21/81 (Petroleum Engineer) might be designated as 21/92F, the new branch and area of concentration code for petroleum management within the Quartermaster Corps.

These are some of the difficult options being considered by MILPERCEN in developing the transition plan. Individual qualifications will be reviewed and the desires of the officers affected will be solicited before a decision is made on reclassification. Full implementation of the revised classification system is expected in FY 87.

Officers in Year Group 79 are scheduled to have additional specialties designated in late 1985. Not all officers will receive a second specialty, but those who do are expected to be designated into functional areas rather than into specialties of other branches.

Commissioned Officers' Branch (continued)

Revised OPMS: (continued)

The revised classification system will enhance and strengthen the branch concept which has been diminished under the current system. This "rollup" of specialties 21, 22, and 23 into one branch code within Engineer Branch is similar to the "rollup" which occurred in Military Intelligence and Aviation Branches and the Ordnance, Quartermaster, and Signal Corps. The new management structure will improve the Army's ability to manage and develop its Engineer officers.

Engineer Branch Chief:

MAJ John Basilotto is acting Chief of Engineer Branch, Office of Personnel Management, at MILPERCEN. LTC Jim Simms takes over the branch in September.

Warrant Officers' Branch

Qualified Personnel Needed:

Engineers need qualified personnel to apply for warrant officers in the following fields:

621A Engineer Equipment Repairs Technician
821A Survey Technician
841A Terrain Analysis System Technician

For more information, contact CW4 Edward Cole, AV 221-7839.

Warrant Officers Training Program:

Applicants for warrant officer must complete a "triple check" evaluation under the new Warrant Officers Training Program before being assigned to their first unit. The new Warrant Officers Training Program abolished direct appointments on Oct. 1, 1984.

The "triple check" process consists of the following.

First, the applicant must be approved by a centralized board drawn from MILPERCEN and the different proponents.

Second, once selected, the service member must complete the Warrant Officer Entry Course (WOEC). This training consists of almost seven weeks of mandatory MOS immaterial training in leadership, ethics, communications, military history, Army structure, and other common core subjects. WOEC is conducted in a high stress, OCS-type environment at Ft. Rucker, AL; Aberdeen Proving Ground, MD; and Ft. Sill, OK.

- Individuals must have a current physical examination which allows them to undergo rigorous physical training.
- Individuals must pass a *standard* Army physical readiness test without modification (activities like bicycling or swimming may not be substituted).

• Individuals over 40 years of age must have "over 40" PT clearance.

Third, candidates in Engineer MOSs will receive their technical training at Ft. Belvoir, VA, or Ft. Leonard Wood, MO. The Engineer School is responsible for certifying the individual is qualified for appointment in his or her MOS based on diagnostic examinations and completion of a resident technical course.

Soldiers interested in applying for warrant officer appointment should refer to DA Circular 601-84-4, *WO Procurement Program FY 85*. For more information, contact CW4 Edward Cole (703) 325-7839, AV 221-7839.

NCO and Enlisted Soldiers' Branch

Promotion Point Worksheet:

The U.S. Military Personnel Center announced that the revised Promotion Point Worksheet (DA Form 3355) for promotion to E5 and E6 was fielded in April 1985. Scheduled for implementation in May and June, the form emphasizes physical fitness, self-discipline, professional competence, and a commitment to self-improvement and achievement. The commander's recommendation for promotion will also be a part of the form.

Duty performance points awarded by the commander were decreased from 200 to 150 points. Promotion board points were also decreased from 250 to 200 points.

The standards and points awarded for other areas such as education, SQT training, and time in service and time in grade were also changed or eliminated.

Master Bridge Builder Dies

Sir Donald Coleman Bailey, 83, inventor of the Bailey Bridge, died recently in Bournemouth, England. Bailey spent much of his early life creating small models of bridges from pieces of wood. He drew the original design of his reknown structure on an envelope and sold it to the British War Department in 1941 for 12,000 pounds ($48,000).

Bailey's idea for his particular design came when he sensed the need for bridging narrow water barriers. The bridge was ideally suited for the terrain and streams encountered in Europe during WWII. Except for the major rivers, most water obstacles had steep banks; yet they were within the limits of the design. The usual cluster of village housing at destroyed crossing sites restricted any mechanical lifting, hence only manpower could be used. Additionally, there were mountain sidecuts, canals, and railroad overpasses requiring passage.

"Without the Bailey Bridge we would not have won the war," Field Marshal Montgomery once said. "It was the best thing in that line we ever had."

MPs control traffic during Scarlet Saber II. The 902nd Engineer Company (AFB) supported by the 1438th Engineer Company (Missouri National Guard) constructed a 44-bay ribbon bridge across the Arkansas River (photo by CPT Kevin Brice).