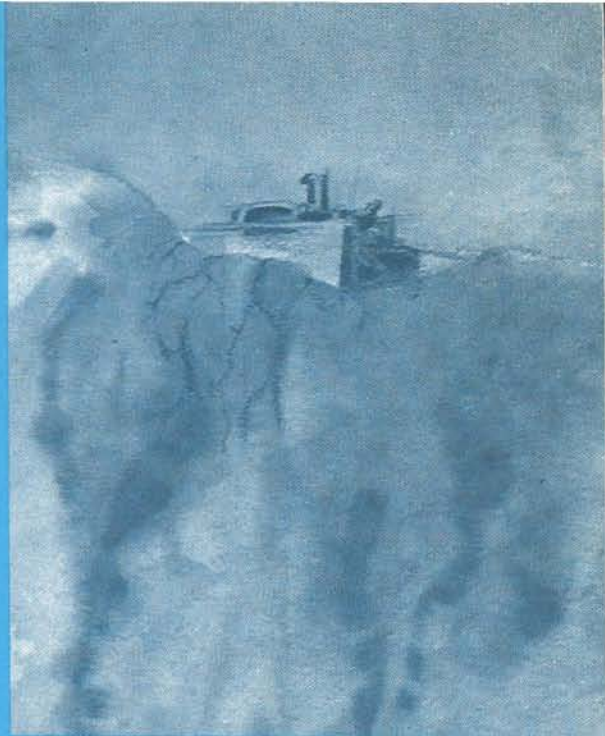
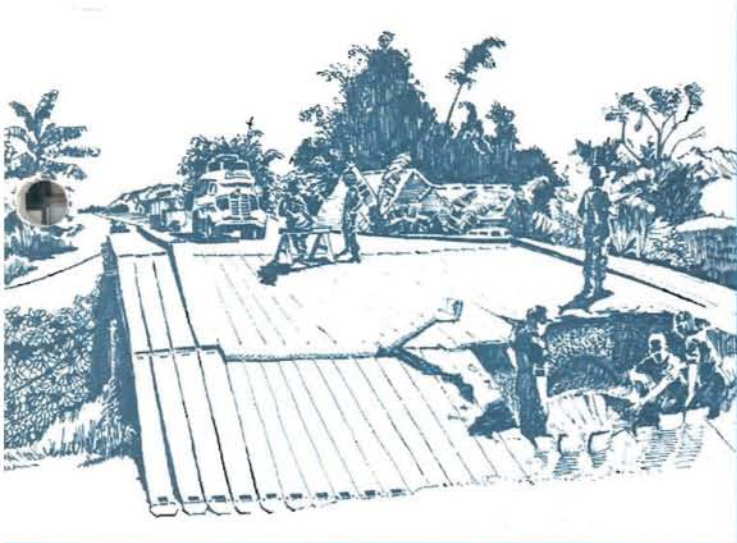




THE ENGINEER



JUL AUG
SEP 1977



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Engineer School
Fort Belvoir, Virginia**

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CHIEF'S BRIEFS

Brigadier General Henry M. Robert was born May 2, 1837 in South Carolina. Upon graduation from the United States Military Academy on July 1, 1857 he was promoted Brevet Second Lieutenant, Corps of Engineers.

Robert taught at West Point and then was assigned fortification construction and wagon road exploration duty in the West. During the Civil War he participated in construction of the defenses of Washington, D.C. and in fortifications work elsewhere.

From 1867 to 1901 Robert served on numerous boards dealing with rivers and harbors, lighthouses, and fortifications. His assignments included duty as Northwest and Southwest Division Engineer.

Upon promotion to Brigadier General on April 30, 1901 Robert was appointed Chief of Engineers and served in that capacity until retirement, required by law, two days later.

General Robert wrote the famous compendium of parliamentary law known today as *Robert's Rules of Order*. He died May 11, 1923 at Hornell, New York.

JOHN M. DERVAN
Assistant Curator
U.S. Army Engineer Museum

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PIPELINE. PIPE

BERH CELEBRATES DIAMOND JUBILEE AS INDEPENDENT REVIEW BOARD FOR ARMY CHIEF OF ENGINEERS

The Board of Engineers for Rivers and Harbors is 75 years old. It was created by Congress under Section 3 of the River and Harbor Act of June 13, 1902.

In celebrating its diamond jubilee, the Board has completed three quarters of a century as the agency of independent review of water resources projects for the Chief of the Army Corps of Engineers. Following authorization and funding of studies by Congress, District and Division Engineers prepare reports on prospective projects which are then submitted to the Board for review. After its review, the Board's recommendations are passed to the Chief of Engineers for further processing to the Secretary of the Army, the Office of Management and Budget, and to Congress for consideration.

During its first 75 years the Board has reviewed more than 8,300 project reports for the Chief of Engineers. Less than 45% of these (3,711) were recommended for construction while more than 4,600 were not.

In addition to its primary statutory mission to review reports on water resources development, the Board is also charged by law to publish information on United States Coastal ports. Port facilities are described in the Port Series, a group of 45 reports which are published on a rotating basis.

The Board also conducts for the Chief of Engineers the pri-

mary training program for Corps planners. Each year a class of 15 selected planners throughout the Corps undertakes the Planning Associates Program, eleven months of resident training heavily oriented to policy, plan formulation, public involvement, environmental considerations, benefit analysis, and other pertinent subjects. The Planning Associates return to the Corps Districts after completion of their year at the Board and join the growing cadre of graduates, which now numbers 173.

The Board is unique within the Federal establishment. Created by Congress to provide a uniform overview and approach to planning and construction, its members are chosen by the Chief of Engineers from among the senior general officers of the Corps of Engineers to provide an objective, critical review of proposed projects. The Board is supported by a professional and administrative civilian staff of 66 which includes engineers, environmental planners, economists, and transportation specialists.

VA WORK-STUDY PROGRAM

Full-time veteran students who foresee money problems at fall enrollment time should look into the Veterans Administration's work-study program.

The VA says that new GI Bill payment procedures might leave students who don't have savings from summer jobs in a bind to pay necessary enrollment and subsistence expenses. To help offset this financial headache, VA will

make more work-study jobs available.

GI Bill students can work up to 250 hours per semester for VA and receive \$2.50 per hour in addition to their usual education assistance allowances. An advance of up to \$250 is available as soon as the employment agreement is processed. The advance covers the first 100 hours of work.

Jobs are available for VA-related work on a given campus or at a VA facility. Priority is established on the basis of service-connected disability, financial need, motivation and the nature of the work. After the first 100 hours, VA pays work-study students after each 50 hours of work.

Details are available from campus veterans counselors or any VA office.

CASH PAY OPTION

Beginning July 1 the "CASH PAY OPTION" was eliminated in Korea. All Eighth Army soldiers will now receive their pay, mid-month and end-of-month, by check. According to MILPERCEN officials, the policy change is being implemented to improve efficiency of operations and to provide a better service to the soldiers. Soldiers leaving CONUS for assignment to Korea are encouraged to check on the advantages of establishing a "Check to Bank Option" at the bank of their choice.

ADVANCE SHA

The Army has proposed advance housing allowance overseas. The Army proposal would amend present legislation to authorize an advance

LINE. PIPELINE.

payment of housing allowance overseas. If the proposal becomes law, it will relieve some cases of financial hardships due to the extraordinarily large cash payments demanded for security deposits on housing in certain foreign areas where housing is in short supply.

CHECKBOOK HELP ON THE WAY

The Army plans to distribute a training "package" this summer designed to help arm soldiers with the knowledge required to manage checking accounts properly.

The program is a result of an Armywide survey indicating a basic lack of knowledge concerning checking account management and banking procedures.

Pointing up the seriousness of the problem, Army officials reported that more than \$6 million in bad checks were passed at CONUS and Pacific commissaries and clubs last year. (USAREUR figures were not included). Even when the bad checks are redeemed, the administrative cost of processing the checks affects the funds available for morale and welfare support activities.

The training program stresses the importance of sound checkbook management, and warns of the consequences of passing bad checks some of which include administrative or disciplinary actions.

Officials at The Adjutant General Center (TAGCEN) say that the training plan will supplement AR 608-16. Since the reg went into effect in 1975, officials claim that the number of bad checks has declined and

expect the new program to reduce the number of even more.

REFORGER UNDERWAY

The strategic mobility exercise REFORGER, in which U.S.-based troop units are deployed to Europe in support of NATO training objectives.

This year's REFORGER marks the second consecutive year that troops will arrive in Germany accompanied by some of the equipment needed to sustain them. In REFORGERS prior to 1976, only the soldiers moved, drawing prepositioned equipment maintained in readiness at installation sites in West Germany.

Heavy tracked vehicles—including the Army's main battle tanks—will be shipped across the Atlantic. Last year's exercise, REFORGER 76, stressed air assault tactics and featured the large scale movement of helicopters.

Upon closing ranks with Europe-based U.S. soldiers and NATO allies, troops from the 1st Infantry Division at Fort Riley, Kansas and 4th Infantry Division (mechanized) at Fort Carson, Colorado will participate as REFORGER elements in the annual AUTUMN FORGE exercise conducted by NATO's Allied Command, Europe.

All NATO nations with military forces committed to the defense of allied countries have scheduled forces to participate this year. In addition to REFORGER, other AUTUMN FORGE exercises include:

CRESTED CAP—the U.S. Air Force's strategic mobility exercise involving U.S.-based fighter bombers deploying to Germany;

COLD FIRE—a multinational exercise connected with several land exercises in the central Europe region;

DISPLAY DETERMINATION—a sea/land/air exercise in the Mediterranean area involving forces of southern region nations, the United Kingdom and the United States;

ARROW EXPRESS—an Allied Command Europe (ACE) mobile for exercise in the northern region;

ABLE ARCHE R—an Allied Command Europe command post exercise.

REFORGER 77 also marks the second consecutive year that personnel of the Military Traffic Management Command's Eastern Area (MTMCEA), will play a major role in the logistical phases of the exercise.

The return phase of REFORGER 77 will begin in late September when equipment moves by train and barge from exercise areas to MTMC's Military Ocean Terminal at Bremerhaven, Germany and Benelux Terminal at Rotterdam.

Major emphasis during REFORGER 77 will be placed on strengthening the interoperability capabilities of NATO allies Common Language doctrine and procedure will be exercised, tested and evaluated by the participants. Improvements in these areas are considered indispensable to providing a reliable deterrent and defense capability by NATO at reasonable costs.



TRAINING

NOTES

FM 6-20 IS COMING!

The final approved draft of FM 6-20, **Fire Support in Combined Arms Operations**, the Army's capstone How to Fight manual for fire support, is now being distributed to active Army maneuver and fire support units. This manual provides the first comprehensive treatment of the maneuver commander-fire support coordination (FSCoord) relationship and illustrates how to integrate all fire support into combined arms operations. It was written by maneuver and fire support personnel, with input from elements throughout the Army, and is designed for all members of the combined arms team.

The doctrine contained in the final draft of the FM is approved by HQ, TRADOC, for instruction at TRADOC installations and for training in the MACOM's. The final approved draft will remain current until superseded by the official Department of the Army printing of the manual in late summer 1977. The DA print will be announced by TRADOC message and will be sent to units, both active and reserve, through pinpoint distribution. If units do not receive the manual within 30 to 60 days from the date of the message, it may be ordered via DA Form 17, addressed through publications channels to: USA AG Publications Center, 2800 Eastern Boulevard, Baltimore, Maryland 21220.

FM 6-20 is not an FA tactics manual. Rather, it is the maneuver commander's and FSCoord's total fire support manual. As such, it complements all TRADOC How to Fight FM's and is to be used in conjunction with those manuals listed in Appendix B of FM 100-5. In addition to FM 100-5, FM 6-20 specifically supports and complements information contained in FM's 101-5, 71-100, 71-101, and 71-2. FM 6-20 will be followed by FM 6-21, **FA Cannon Battalion**, and FM 6-22, **Division Artillery**, **FA Bridge**, and **FA Assigned to the Corps**, which discuss tactics and operations for internal FA organizational use. Each manual will be "product improved" as the need arises.

RESERVE AMPHIB TRAINING

Ft. Monroe, Va. (TNS) — Members of the Army's reserve components are now eligible to apply for resident training at the Navy's amphibious school in Norfolk, Va.

Of special importance are two one-week courses in amphibious warfare and planning, which are designed to train combat staff officers who have little or no experience in beach assault tactics.

The catalog may be obtained by writing to Commanding Officer, Naval Amphibious School (Little Creek), ATTN: Senior Education Advisor, Norfolk, Va. 23521.

SQT PERSONALIZED

Ft. Monroe, Va. (TNS) — The new Skill Qualification Test (SQT) is not exactly "personalized" for each soldier, but it is being tailored to meet the soldier's actual job requirements.

A spokesman for U. S. Army Training and Doctrine Command explained that SQT developers have constantly kept in mind that a soldier has certain tasks each day that may not be performed by others in the same MOS. "We want SQT to be as fair and realistic as possible. We knew, for instance that within MOS 11E (Armor Crewman), a soldier could be working with the M60A1, M60A2, or M551 Sheridan. So the test has three "tracks." Some 'tracking' has to be done or the tests wouldn't be fair or valid.

"The SQT is designed to test a soldier's ability to perform the tasks that are critical to success of his mission and survival on the modern battlefield. So we test every soldier — no matter what MOS — in some common soldiering skills, such as first aid.

"Then we get specific. For instance, soldiers in Air Defense MOS 16P could be working with either the Chaparral system or Vulcan. We find out who works with which system and that's the test he gets."

Another MOS which boasts of a "tracked" SQT is MOS 11C, which discriminates between the 4.2 inch mortar and 81mm mortar.



The spokesman added, "Other MOS with obvious differences like those will show up with appropriate tracks to solve the needs of most soldiers."

The spokesman pointed out Test Control Officers (TCO) at each installation have a listing of each soldier by MOS and job. The TCO then tells the Individual Training and Evaluation Directorate at Ft. Eustis, Va., who gets which test.

Approximately 60 days prior to the beginning of the testing period each soldier receives an SQT Notice, which outlines each of the tasks to be tested on his individual SQT. SQT Notices now being prepared include a sample question for each task tested in the written component and a complete checklist for the hands-on component.

ANNOUNCEMENT OF WEEKEND COURSES FOR RESERVE COMPONENTS FISCAL YEAR 1978

The United States Army Engineer School Fort Belvoir, Virginia will conduct weekend courses in FY 78. Each course will be approximately 14 hours long. Application will be through the chain of command. The courses are oriented towards those whom by MOS or job assignment are responsible for planning, conducting or supervising training in the following subjects.

Date	Course Number	Subject
19-20 Nov 77	78-RC-SP1	Mine/Countermines Hardware, Doctrine and Operations at Battalion Level
10-11 Dec 77	78-RC-SP2	Terrain Evaluation
14-15 Jan 78	78-RC-SP3	Engineers in River Crossing Operations
28-29 Jan 78	78-RC-SP4	Division Obstacle Plans and Retrograde Operations
25-26 Feb 78	78-RC-SP5	Engineers in River Crossing Operations
11-12 Mar 78	78-RC-SP6	Division Obstacle Plans and Retrograde Operations
18-19 Mar 78	78-RC-SP7	Mine/Countermines Hardware, Doctrine and Operations

COURSE IN PRIME POWER PRODUCTION OPEN

You may be eligible now for training as a specialist in Prime Power Production. Applications are being accepted from career enlisted personnel for studies encompassing engineering, plant technology, maintenance and operations. Those interested should contact their military personnel office immediately for a copy of AR 350-224.

The next class starts in April 1978 so you may want to check requirements for entering the program as soon as possible. If you are grade E6 or less on active duty, scored at least 115 in aptitude area EL and GT, and scored 70% or better in Basic Mathematics and Science Proficiency Test (revised 1975), you may be eligible for this expanding career program.

The year-long course in academics, specialty and operations is conducted by the Facilities Engineering Support Agency (FESA), a field operating agency of the Corps of Engineers, located at Fort Belvoir, Virginia. Teams of

highly skilled technicians trained by FESA are being deployed at Army installations around the world to conduct infrared surveys of electrical systems, perform detailed repair and maintenance of utility systems, and put into operation the latest in applied power technology in addition to operating and maintaining the Army's nontactical generator assets. FESA has also taken on an increasingly important role in energy conservation and is now the lead Army agency in this area.

The program offers opportunities for professional work, varied assignments, additional college credit, and life-long benefits. Applications are processed through local command channels to the installation adjutant general. Time may be short to process your application so please respond today if you are motivated to complete the program and gain status in your chosen career as an Army Prime Power Production Specialist. Further information may be had by calling Training Division, FESA: AV 354-5235.

**ENIWETOK,
A Household
Word Again**

John J. Connor

Between 1944 and 1958 Bikini and Eniwetok, two atolls in the mid-Pacific Marshall Islands were "household words." They were in the news because they were the sites of American nuclear bomb tests. In fact, the word "bikini" has become a regular part of our vocabulary. According to one dictionary the name infers an atomic bomb when it was first introduced.

Eniwetok is in the news again because of the massive "cleanup" now getting underway there. We can expect to hear much more about this remote atoll as the ambitious project progresses. This article will not discuss the project in any detail but only serves to "introduce" Eniwetok and say a few words about the Marshall Islands and how they have fared since World War II.

Eniwetok (the island looking east) is comprised of 40 islets of a total 2¼ square miles strung on a circular coral reef that rings a lagoon of 388 square miles. Of the 34 atolls and single islands that comprise the Marshalls, Eniwetok is only the thirteenth in land area, but its lagoon is the second largest! Located roughly 2,500 miles southwest of Hawaii, it was first sighted in 1529 by a Spaniard, Alvarado de Saaverda. However, the first record of a westerner setting foot on the atoll was not until 1792.

In the 1930's, Japan began fortifying the Marshall Islands in violation of the League of Nations mandate giving her control of most of Micronesia. Eniwetok was developed as both an airbase and a naval anchorage. When the United States was selecting targets during the "island hopping," of WWII Eniwetok was chosen to be invaded. The operation, code named CATCH-POLE, kicked off on February 17, 1944 as the 22nd Marine Regiment landed on Engebi Island on the northern rim of the atoll. Attacks on Parry and Eniwetok Islands followed. In four days of fierce fighting 339 Americans and 2,677 Japanese died. Bikini Atoll was taken without resistance. Eniwetok now served as an advanced anchorage for the United States Navy and a staging area for U.S. ground forces preparing for assaults on Saipan, Tinian and Guam, 1,000 miles westward in the Marianas.

In February 1946 the United States chose Bikini Atoll as a site for nuclear weapons testing; and in December 1947, Eniwetok was selected as a second test site. First however, the 167 residents of Bikini and the 145 residents of Eniwetok had to be "resettled." When the testing ended in July 1958 both atolls were ravaged. Radiation prevented the relocated inhabitants from returning.

Neither atoll is entirely safe today — nearly 20 years later! — but the people of Bikini and Eniwetok still long to return.

The attempt to clean up Bikini began in 1969. In mid-1974 it appeared that the former residents would be "home for Christmas." However, new tests showed that radiation levels were still too high for children, and women of child-bearing age. The effort to restore Bikini was beset with problems to include logistical support and construction costs. A Marshall Islands-based construction firm struggled to complete the project only to find that the community leaders didn't approve. Then came the news of the radiation levels.

When the more ambitious Eniwetok cleanup project was being planned, officials wanted to avoid the pitfalls encountered during the Bikini work, despite increasing costs. The United States felt obligated to revitalize Eniwetok and allow its people to return. In an attempt to lower the price of the initial phase it was suggested as far back as 1973 that Army Engineer troop units be employed. To the surprise of many, this was approved.

Some nostalgia pacific soldiers would be surprised to see the area today. Some of the remote islands have changed little, but life in the District Centers has progressed at a fast pace, especially in the last 7-10 years. At Majuro Atoll 680 miles southeast of Eniwetok, a \$3-million Corps of Engineers-supervised construction program was carried out between 1971 and 1974. The products include an international airport and terminal, paved roads, a water distribution system, a vocational high school, a district courthouse, and other municipal facilities. On Kwajalein Atoll, home of the Kwajalein Missile Range, and about 400 miles southeast of Eniwetok, the atmosphere is "suburbia in the mid-Pacific." But the scene on Eniwetok is still stark. The vegetation shows the effects of the nuclear tests of two decades ago: the palm trees, where they exist, are only half the height of the telephone poles! The rebirth of Eniwetok is really just beginning, but before this project is complete, "Eniwetok" should be a "household word," **again**.

CPT John J. Connor received his BS in Geology from Boston College. He is a graduate of the Engineer Officer Advanced Course and OCS. CPT Connor previous assignments were Project Engineer, for Majuro Atoll, Marshall Islands and Information Officer, HQ 39th Engineer Battalion, Ft. Devens. Presently CPT Connor is retired.

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COLONELS:

REFERENCES PLEASE: If you have moved since you last sent us a preference statement, please submit Nov 75 edition of DA Form 483 in the mail. Sections of Form 483 that are of special interest are family size and ages of children (for school and quarters consideration), whether you are interested in an overseas tour, whether you own a house that you would like to live in, and current address/telephone numbers. The more we know of your current status, the better we can consider and accommodate your "druthers." If the form doesn't suit all your needs, a letter or phone call would be appreciated.

SPECIALTY DESIGNATION: Colonels Division has just finished a complete review and adjustment of specialty designations. One of the major changes was the replacement of the Logistics Management Specialty (SC 70) with other logistics specialties as designations for Colonels. In making changes we have looked at a number of alternate specialties in light of recent assignment experience and requests. Each affected officer should have received a letter specifying any changes. If you have questions, please drop us a note or give us a call.

PLANNING AHEAD: The earlier view we have of changes in assignments the less trauma is created for yourself and others. Let us know about six months ahead if you plan to request an extension or if you begin to make retirement plans. A month or two trade-off in the planning stages may make approvals and relocations easier for all.

LIEUTENANT COLONELS:

WELCOME TO NEW SELECTEES: Congratulations to those officers selected for promotion by the recent Lieutenant Colonel (AUS) board. The competition was tough and each of you can take pride in your selection. You will face new challenges and new demands as O5's and MILPERCEN welcomes the opportunity to work with you in meeting your career plans and needs.

DON'T BE AN ENIGMA! For old and new: Read the comments for Colonels in regard to preference statements. They apply to LTCs, too. If we have your preferences and your telephone number we can discuss your next assignment with you. If we don't have that information, the assumption is that you have no strong preferences. So **please**, take a few minutes to let us know your interests.

SAY IT AGAIN SAM! Most of the assignments LTCs desire require CGSC level schooling. It does not matter how you accomplish it — just that you do. If you have not already attended or been selected for resident schooling, then invest some time in your future by taking the non-resident course. It will open up many opportunities for you and will be time well spent.

POTPOURRI

MAJORS:

Congratulations to those of you selected for promotion to major. You can provide much needed help making up the critical shortage of engineer majors. Your goals as a major should include completion of CGSC (to include the non-resident course if you aren't selected for attendance either this year or next), becoming qualified in your alternate specialty and completing a masters degree which will support engineering or your alternate specialty. Majors Division of MILPERCEN operates differently than does the company grade branches. Each of you now have two assignment officers (myself and your alternate specialty manager) and a professional development officer. All three of us act on each action concerning you, whether it is on civil schooling, alternate specialty change, assignment, etc.

ASSIGNMENTS: Army Readiness Regions (ARR) continue to receive very high priority. At present there are 79 positions that must be filled by engineer majors. Overseas vulnerability is changing! New majors who had one overseas assignment to date, should consider themselves on the launching pad! That does not mean the senior major is entirely off the hook. Many considerations are involved, to include availability, special qualifications for a particular position, professional development, and individual desires.

GENERAL:

MILPERCEN continues to emphasize the importance of such items as a current photo and physical, and an update of your record brief. Also, if your records will go before a promotion board (LTC AUS or RA MAJ) you should review your official file before the board convenes. This is especially important now that your file is being microfiched. If it is impossible for you to visit us, I recommend that you request a microfiche copy of your file. That would provide a check for completeness. Request should be sent to DAPC-PSR-S 200 Stovall Street Alexandria, Virginia 22332. Fees are \$2.00 for the first fiche and five cents for each additional fiche; a bill is forwarded when the request is filled.

CAPTAINS AND LIEUTENANTS:

NEW ARMY POLICIES: Effective 16 June 1977, Ranger training is available only for officers commissioned in the Infantry, Armor, Field Artillery, Air Defense Artillery, Engineer, and Signal Corps branches who are eligible for assignments to Category I units, officers scheduled for Ranger assignments, and as voluntary precommissioning training for those ROTC and USMA cadets eligible for assignment to Category I units upon commissioning. Female officers and female cadets are

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specifically excluded from Ranger IAW Army policy which precludes their assignment to combat or close combat support units or duty associated with a direct combat role. Effective 1 October 1977, Airborne training is available only to those officers on assignment to Airborne units, and as voluntary precommissioning training for USMA and ROTC cadets. As an exception to this policy, USMA and ROTC cadets in classes of 1977, 1978, and 1979, and graduates of OCS classes through FY 78, will continue to be eligible for Airborne training after commissioning regardless of anticipated assignment.

CONGRATULATIONS: Congratulations to those First Lieutenants selected for CPT, AUS. The next CPT, AUS, Board is tentatively scheduled for November 1977.

MANAGED TENURE PROGRAM (MTP): The MTP is the system by which HQDA selects nonregular warrant officers for retention on active duty for periods past their 20th year of Active Federal Service (AFS). In the absence of such selection, nonregulars must be released from active duty upon completing 20 years AFS. Impacting upon the MTP is the continuing growth of the Regular Army Warrant Officer Corps. At its current rate of growth, the Regular Army will provide fill for all of the Army's "over 20" vacancies in the foreseeable future. Consequently, HQDA is currently studying a proposal to abolish the MTP and rely on the Regular Army as the only means for warrant officer retention beyond 20 years AFS. A specific feature of the proposal envisions the creation of an "RA decision point" for warrant officers. The proposition is that individuals must accept a tender of appointment in the Regular Army no later than their 15th year of AFS or their completion of OBV (whichever is later), or be mandatorily released from active duty upon completing 20 years AFS. Individuals would still be able to apply for an RA appointment up to their 14th year of AFS or 2d year of OBV (whichever is later), but at those points in time all nonregulars would be considered by the HQDA Regular Army Selection Board. Those selected by the board would be tendered an RA appointment to be consummated no later than the decision point, i.e., the later date of either their 15th year of AFS or completion of OBV. Individuals in OBV status who are not selected or who decline appointment would still have the option of applying for a VI service agreement that would cover the period between OBV expiration and their 20th year AFS. These proposals are still under study and no decisions have been made to implement them. Meanwhile, HQDA is making arrangements to convene what may be its last MTP board. The board has been tentatively scheduled to meet 29 November 1977 to consider for retention all nonregular warrant officers whose current release date (i.e., completion of their 20th, 23d or 26th year AFS) falls in fiscal year 1980. Announcement of the board and rosters of personnel in the zone of consideration will be provided by a DA Circular 135-series that is now pending publication. If a decision is made to abolish the MTP effective with this FY 80 group, then the presently scheduled board would be cancelled. Instead, all FY 80 eligibles, plus all other warrant officers who have completed more than 14 years AFS, would be considered by the RA Selection Board. Selectees would then be tendered an appointment in the RA—thus making FY 78 their decision point. Nonselection for RA, or declination of RA appointment, would make the individual's current release date operative, except for personnel still in OBV status, who could apply for VI if they desire to serve beyond their OBV expiration date until completion of 20 years AFS.

POTPOURRI

WARRANT OFFICER SENIOR COURSE (WOSC): HDQA has scheduled the next WOSC Selection Board to meet 29 November 1977. It will select students to attend in 1979. Operation of the selection system is described in DA Circular 351-75 dated 21 July 1977. Preparation of the rosters of warrant officers eligible for consideration is currently in progress. All eligible personnel will be considered by the board. In addition, all previously selected warrant officers whose attendance was deferred will be reviewed by the board to validate their select status. It is anticipated that selection results will be published in January 1978.



FOR ALL:

QUESTIONS RELATIVE TO OER'S: Active duty officers and warrant officers with questions relative to the filing of OER's, status of OER appeals, or documents filed in their Officer Military Personnel File can now call 325-8792 for an answer. This is the number of the Personnel Records Division's 24 hour a day automatic telephone answering and recording service. Written or telephonic replies will be furnished to the caller within 5 working days.

ENGINEER PERSONNEL MANAGEMENT CONTACTS IN OPMD:

- Colonels Division (DAPC-OPC-AE)
Engineer Assignments, LTC Lin Lufkin, 7871
- Lieutenant Colonels Division (DAPC-OPL-AS)
Engineer Assignments, LTC Thomas Fisher, x0423
- Majors Division (DAPC-OPM-A)
Engineer Assignments, MAJ Gary Woodham x8109
- Combat Support Arms Division (DAPC-OPF-E) (Company Grade)
Engineer Branch Chief, LTC Norman Kuklinski, x0650
CPT Assignments, MAJ Mike Foster, x0651
LT Assignments, CPT Matt Dominy, x7434
- Warrant Officers Division (DAPC-OPW-AU)
Engineer Assignments, CW3 Frank Russell, x7837

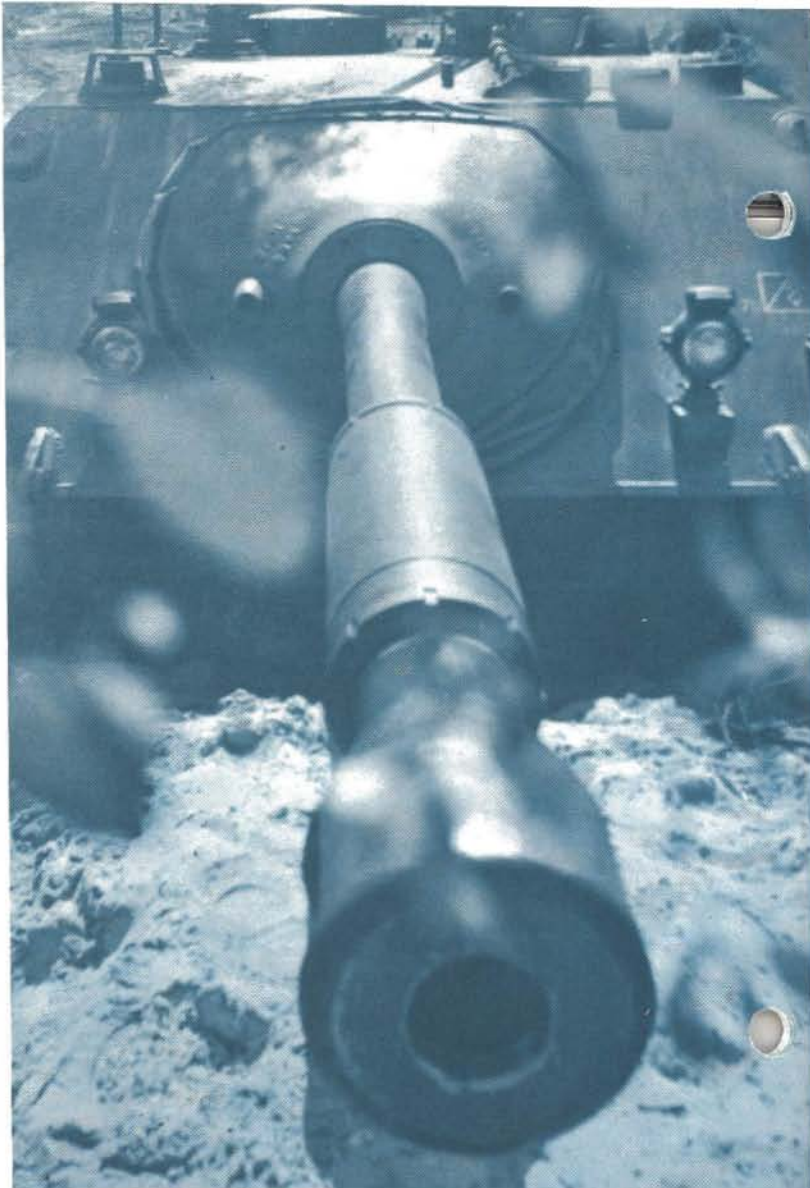
If you cannot call, please write to the following address:

Commander
US Army Military Personnel Center
ATTN: (appropriate office symbol)
200 Stovall Street
Alexandria, Virginia 22332

In Defense of Germany

LTC Andreas F. Wittenberg

LTC Andreas F. Wittenberg is a graduate of the Armed Forces Staff College, and is an officer in the German Bundeswehr. LTC Wittenberg is presently back in Germany.



Cooperation between the Bundeswehr engineers and the United States Army combat engineers in West Germany is real. It is continuously practiced by units linked through "PROJECT PARTNERSHIP." This program joins a German "sister-unit" to each United States battalion. This special affiliation allows for common field exercises, joint training camps, and mutual exchange of experience. The United States combat engineer battalions practice and learn in a peacetime environment how to operate with their German partners.

Working together during the REFORGER exercises, between the Bundeswehr and the CONUS combat engineers, is a considerable challenge. The REFORGER units have been required to operate with units having an organization unfamiliar to them. In addition, both the employment doctrine and engineer equipment are different. This article is to help lessen the problem described. In doing so it will discuss;

- the main differences between the organi-

zation of the United States and Bundeswehr combat engineers,

- the methods of cooperation and
- the problems encountered during the transfer of obstacles

Organization of German Engineers

A Bundeswehr division has two types of combat engineers. As in a United States division there is an engineer battalion assigned to the division base. It has a headquarters and service support company, three engineer companies mounted on trucks, and a construction equipment and bridge company which carries the German floating bridge. The German amphibious bridge is located in the Amphibious Bridge battalion at Corps level. The commander of the divisional engineer battalion is "doublehatted." He is a special staff officer, "division engineer," on the division staff. In this role he advises the division commander on engineer matters.

In contrast to the United States Army Organization, the Bundeswehr brigade has a fixed organization with three combat battalions (Infantry, Mechanized Infantry, or Armor), an Artillery battalion and its own organic combat support and combat service support companies. Included is an independent armed engineer company (Panzerpionierkompanie), mounted in M-113s and equipped with bridgelayers and combat engineer vehicles. The armed engineer company commander is also "doublehatted" and is referred to as the "brigade engineer" while performing his special staff functions. In addition, he is responsible to the division engineer and controls all engineer units which may be assigned to the brigade from the division.

Likewise, the division engineer reports to the Corps engineer (Pionierkommando) who commands the four to six engineer battalions in the Corps base.

All German divisions, in general, have more combat engineer units available than their American counterparts. However, German combat engineer units do not have a secondary mission to fight as infantrymen.

Doctrine of German Engineers

Both the United States and the German army combat engineers are responsible for assisting the movement of friendly forces and degrading enemy mobility by use of obstacles. The development of the barrier plan is based on the same tactical considerations:

- block the enemy's avenues of approach, but do not degrade your own mobility
- create obstacles where the terrain offers a chance to save munitions and manpower
- cover obstacles by direct fire and plan artillery fire where the attacker may mass in front of a barrier

In the Bundeswehr the barrier plan is proposed by the brigades and approved by the division. The plan is executed by engineers (however, other obstacles such as barbed wire entanglements may be created by any combat unit). Once an obstacle is in place both the brigade and division engineers will order the transfer of that item to an adjacent combat unit. All German combat units are trained to take over the responsibility for minefields. In addition, all infantry units are trained to detonate demolitions in road-craters and bridges or to create an abatis without assistance from engineers. Consequently, the rapid turn over of completed obstacles to combat units free engineer manpower to complete other projects, such as

preparing barriers, to protect the flanks and provide barrier reinforcement of the terrain in depth.

The Wallmeister Organization

The basis for all barrier plans in Germany is a dense system of prechambered bridges and road-craters. These projects are normally initiated by the division engineers, approved by national and Allied authorities and executed by the Wallmeister Organization.

The Wallmeisters are a part of the German Territorial Forces, they are organized on an area basis. Usually, a Wallmeister group will cover one district. The district is further subdivided into several areas that subordinate teams of which three to four members will cover. These engineers know every route, bridge, possible bridge site or ford in their area of responsibility. The Wallmeisters control all barrier preparations in peacetime and are also experts in the possibilities that the terrain offers to create additional obstacles. They also assist German and Allied combat engineers in the use of German national resources such as sawmills, quarries and gravel-pits. In addition, they have reconnoitered all power plants, dams, locks and water points in their region and can provide detailed information about them. They also can provide special maps and will assist NATO units in updating their maps.

The Wallmeister has the knowledge, expertise and capability to help the NATO engineer units accomplish their mission. The district chief engineer and his Wallmeister groups should be the first contact for an Allied combat engineer unit arriving in Germany.

Cross Attachment of American Engineers

Even though the cross attachment of German and American platoons or companies is not practical during wartime, it is common to practice PARTNERSHIP units. This procedure is best to create mutual understanding and achieve the experience in handling those little details in cooperation that could make the difference during a battle. Also, in Europe, it is a necessary and useful Allied custom to mix battalions or brigades of different nationality during field exercises.

If an American brigade is under the operational command of a Bundeswehr division, the American division engineer will assign a combat engineer company in direct support to that brigade. This engineer company will be reinforced with heavy equipment from its own battalion base. Maintenance, supply and replacement for the engineer company must also be provided by the American



PROJECT PARTNERSHIP

engineer battalion. However, there is one exception to this rule. If the attached American brigade reinforces a German division in a defensive situation and is required to execute a German barrier plan, they can use German munitions. These munitions are warehoused in proximate stockpiles and identified for each particular mission. The logistical problem is solved, however a training problem is created. An American combat engineer company because of its PARTNERSHIP experience will be skillful in the use of German equipment and munitions, but a REFORGER company will not. Consequently, REFORGER units must receive training in the use of German equipment and munitions or be provided with German advisors to assist them. In addition, the combat engineer company will be expected to act as a brigade engineer and render the same reports as his German counterpart. He will keep the German division engineer informed on:

- the status of obstacles(intention, initiation and completion).
- changes caused by enemy fire
- changes and additions to the barrier plan
- activities of enemy engineers
- his own engineer situation

Most of these reports are prescribed in the Division Field Standing Operations Procedures (FSOP) and some of them have been agreed upon by all members of NATO. The results of the agreement are included in the STANAG, e.g.

DA-Form 1355 or STANAG 2036. Therefore, in this situation, it is imperative that the company commander contact the German division engineer, concerning the following:

- the combat engineer task
- the barrier plan and the target folders
- the limitations, restrictions and authorizations
- the munition storage plan, the keys of the munition bunkers and special passports
- the FSOP

Since both armies combat engineers are bound by the same STANAGs, Allied Publications (AP) and Allied Tactical Publications (ATP), with the exception of the munition problem, this type operation should flow smoothly. In addition, both armies feature decentralization of responsibility and authority and they both give mission type orders at all echelons. However, an exchange of liaison officers might be helpful.

Cooperation Across a Common Boundary

As noted earlier cross attachment presents some technical and logistical problems. However, it is the exception rather than the rule. Coordination of adjacent American and German combat engineer units across a common boundary will be a frequently occurring problem. It must be assumed that the aggressor will always seek out boundaries as weak points to attack. Corps and divisional commands emphasize coordination across these boundaries by the installation of coordination points. Normally, liaison teams will be available to exchange all current information. These teams are normally detached from combat units and are reinforced by forward observer parties and forward air controllers. Normally, combat engineers will not be included. Combat engineers may be attached if in the vicinity of the coordination point, there are important obstacles that need to be closed or fired by engineers.

There must always be close coordination between the engineer commanders of the two adjacent divisions. This is true, for two reasons, as it pertains to coordination and exchange of barrier plan information. First, since a boundary is an imaginary line, the battlefield will not necessarily end where responsibility changes. The possibility that elements of the one nationality may become dispersed or may be forced by the enemy to withdraw through the area of the other must be considered. Insufficient information about the barrier situation on the other side of the boundary could endanger friendly troops. The barrier plan information should cover an average

area of 10 kilometers on both sides of the boundary. This could be accomplished by sending information copies of the regular barrier reports to all concerned, by liaison officers or liaison teams at coordination points. Secondly, the shortage of combat engineer troops forces austere measures to be taken. In other words, one minefield may be sufficient to protect the flanks of two adjacent divisions. The necessity to maintain contact between two adjacent engineer battalions or division engineers is very important but difficult to achieve. The headquarters of the battalions are often located too far from each other to maintain radio contact. In addition, the "official communications channel" is ineffective because the traffic travels from the U.S. combat engineer battalion to the U.S. division — U.S. corps — Allied Army Group — German corps — German division to the German engineer battalion. It is also unwise to rely on the use of courier-officers between the adjacent division headquarters, because there is no regular schedule for them. An adequate way to communicate seems to be with the use of the point-to-point telephone line, which is usually installed between adjacent division headquarters. However, the division engineer has to share this communication line with all members of the division headquarters. A better way to accomplish the task is to exchange liaison officers with the appropriate communication equipment. The liaison officers can become the eyes and ears for their commanders and will have a personal interest in transmitting their messages and collecting information. The liaison officers can save time because they will be able to immediately answer most questions.

Cooperation During Relief in Place

The most serious problems in cooperation of U.S. and German combat engineers occurs during a relief in place. This relief can be caused by a complete change of fighting divisions or by a small shift in the corps boundary.

If an American combat unit assumes the responsibility for a certain defense area from a Bundeswehr unit, there will be some obstacles that must be transferred. The responsible division engineers will be consulted by the planning staffs. The following steps are necessary:

1. The outgoing engineer commander is responsible for informing the incoming engineer commander about the actual barrier situation by means of the barrier plan. This briefing should include:

- location, current status and markings of completed barriers

- units responsible for the obstacles
- officers authorized to close or to fire
- obstacles not completed
- planned obstacles
- prestocked munitions
- tactical purpose of each obstacle

2. This information will assist the incoming division in making the decision on how to fight the battle in the transferred area. Based on that decision a warning order will be sent to the engineer units to effect the transfer of the obstacles.

3. A representative for both the incoming and outgoing engineer unit will meet to coordinate the transfer. They will normally discuss the following items:

- the schedule for the transfer
- methods for the delivering unit to recognize the correct receiving unit (authorization)
- how to report the completion of transfer

The outgoing engineer delivers the target folders for planned obstacles and the updated barrier plan. It is recommended that the headquarters be collocated until the transfer is completed.

Transfer of Minefields

The transfer of minefields is facilitated by the use of the NATO standardized DA Form 1355. The form contains most of the data the incoming engineer unit needs to know and is prepared in five copies. One copy should go to the unit that has the responsibility for the minefield (this is the copy that will be transferred to the incoming American engineer unit); the second copy will remain at the German engineer company which created the barrier; the third and fourth copies will be forwarded by the German division and corps engineers to their American counterparts; and the fifth copy will be forwarded through the official channels to the highest national authority.

The minefields will be established with German mines. Consequently, if a lane is to be closed by the incoming American unit, the unit must be trained in the use of German mines. This will present a problem for REFORGER combat engineer units. Therefore, it is recommended that these units close the lanes with American mines. However, this must be noted on the DA Form 1355 and be sent through channels so that all other copies of the form may be updated.

During the transfer, the American unit should also be prepared to install its own lamps and signs because the German engineer units will probably take their equipment with them.

Bridges, Roadcraters, Abatis

If charged demolitions must be transferred additional problems can be expected. If a target folder is used it should contain a demolition plan which can facilitate the translation. Another aspect of the problem is the incompatibility of equipment. For example, the Bundeswehr engineers use a different blasting machine and firing wires of different rheostat than the Americans. They usually use a combined electric/nonelectric firing system. They also use a primer cap which is not used in the American army. American combat engineers using the German system would experience difficulties in testing the functional capability of the system, in arming the system (safe to armed) and finally in firing it. If additional training is not possible, the best solution would be to replace the German firing system with the American system.

Most demolitions require additional mine-laying to close gaps around the created obstacle and to hamper the enemy engineers attempt to breach it. The German mines would have to be changed if the American unit has not been trained in the use of them.

The Language Problem

With very little training experienced engineers would be able to cope with the differences in the Allied equipment. However, the problem which will defy a satisfactory solution, even for trained engineers, is the language. The actual transfer of obstacles will be handled by platoon leaders. The average German platoon leader does not speak sufficient English, and the average American platoon leader, in spite of the recent language training programs, does not speak enough German.

As mentioned above, the DA Form 1355 or the NATO target folder will be used during the transfer procedure. The present version of the form that is used in the Bundeswehr is bi- or tri-lingual; thus, some help is at hand.

A big improvement would be to develop a multilingual transfer folder. Since the transfer MUST be completed by a written receipt, why not use that to report all significant information on a bilingual checklist? This form could assist in solving other problems. For example, it could provide the incoming engineer some type of authentication recognition. The delivering platoon leader would know that the soldier in a different uniform asking him for his blasting machine keys is in fact the authorized person. The recognition of his battalion or brigade commander signature on the transfer folder would solve this authentication problem. Another problem that could be solved with the proposed transfer folder is that of

authorization to fire a demolition. Field manuals for both armies say that the outgoing commander is in command during the relief in case of an enemy attack. However, the incoming American engineer platoon leader will have a STANAG 2017 Annex A (Orders to the Demolition Firing Party Commander) signed by the incoming American brigade commander and installing a chain of command for each particular demolition. But, this order remains invalid until the relief of the entire area is completed and the responsibility has been formally turned over to the incoming brigade commander. It would be an ineffective solution to provide STANAG's 2017 Annex A, just for the time of the relief. Therefore, the transfer folder would be an appropriate vehicle to fill the gap. The outgoing commander could use it to order the outgoing engineer unit to transfer its firing orders. Likewise, he could direct the incoming engineer unit to use the firing orders of its predecessor for a limited time or until it receives orders to destroy it. Then the incoming American combat engineers would use the new orders. It is obvious, that a decisive and irrevocable order as the order to fire a brigade must be given in written form. Thus, the transfer folder would be the most simple method during the relief in place.

Summary

If the NATO forces in central Europe are attacked the task performed by the combat engineers will undoubtedly be the key factor that will allow those forces to hold until reinforcements arrive. Thus, the cooperation between the American and German combat engineers is imperative. Even though the problems discussed in this article were focused on the relationship between the American and German engineer units they are equally valid for other NATO combat engineer units that will be employed in Germany. Consequently, we cannot afford to wait for high level solutions to the problems, we must act now because **interoperability must be achieved prior to hostilities**. The solutions to these problems can be achieved through cooperation and training at the working level. Therefore, all combat engineer units entering Germany should be encouraged:

- to contact the district chief engineer and his Wallmeister groups
- to take advantage of all opportunities to become experienced with German mines and demolition equipment
- to make quick contact with adjacent German engineer units to confirm agreements of cooperation

STOPPING

AN

ARMORED ATTACK

COL Jerome B. Hilmes

A dreadful roar filled the valley, inspiring awe and fear in the men who waited in silence on the slopes. Eyes strained to pick up the first movement, but smoke and fog combined to frustrate detection. The roar was louder now, the clatter of the tracks discernable from the heavy whine of the engines. Then through patches of haze they came into view — dozens of enemy tanks, wave upon wave, screaming down the small valley in a violent and headlong dash to their objective at the other end. At their high rate of speed, they would be past the defenders in a matter of minutes. There were so many, they literally filled the valley. Could they be stopped?

The defending Task Force opened fire first with their M60A2 and M60A1 tanks, then with their TOWs and Dragons. Where were those Cobras? The enemy force was moving too fast, their numbers too great. Their momentum had

carried them to within hundreds of meters of the foremost defenders. Then they hit the ditch.

The surprise was evident; the ditch had not been reported by their reconnaissance parties the night before. Some stopped, looking frantically for a gap. Others probed the ditch, some cautiously, some aggressively. Succeeding waves came to a halt — keeping a distance from the previous wave, not bunching up — a tribute to their discipline. It became a turkey shoot now, the defenders continued to pour down their deadly fire. Now the artillery was coming in with devastating effect. Some tanks tried end runs, but the ditch sprawled across the valley floor, leading them to death at point blank range on the flanks. A few tanks broached the ditch; their bare bellies rising high in the air as they cleared over the mound of spoil. They were inviting and vulnerable targets to the expectant anti-tank gunners. The area had become

a killing zone. The engineers had done their job.

Stymied by the ditch and decimated by direct and indirect fire, the attackers moved back with a final burst of smoke. Once again the defenders strained for visual contact. The artillery was called off. The Task Force began to move to maintain contact. Now the TOW-Cobras came to join in the pursuit. The whole encounter lasted but for a few minutes — quick and deadly. The careful planning of the Task Force Commander had paid off with a successful defense by his combined arms team — armor, infantry, artillery and engineers. They had fought and won the first battle of the next war.

The description of the above "battle" (with a little poetic license) was typical of a scene repeated several times by the forces of the 3rd Armored Division at Hohenfels in the summer of '76. Maneuver battalions and the divisional engineer battalion were "taking their ARTEPs." The ARTEP (Army Training and Evaluation Program) provided these battalions the opportunity to demonstrate their training in a combined arms environment under the scrutiny of evaluators. The "enemy" was the divisional Armored Cav Squadron reinforced. The artillery was simulated as was the "deadly fire." The ditches were real, as was the laughter of the engineers on the slopes as they watched the armored attacks growl to a halt. The ditches had not been there the "night before," but were constructed across the 400-600 m valley in the early hours of the operation while the opposing forces were reconnoitering farther to the front. The training benefits were numerous and significant.

BANG! That vulnerable belly is exposed 6 to 10 times during a crossing.



ATTACKING THE DITCH BY RAMMING. The gun is slewed. Ditch is too deep for enemy to turn it into a dug-in firing position.

Benefits of Anti-Tank Ditches. Some of the salient advantages of this easily-constructed obstacle are:

- Minimum logistic support required (vis-a-vis a minefield for example). We employed a D-7 dozer and 2½ CY scoop-loader team. With full fuel tanks they can work all day or all night. No big haul requirements.

- Puts a physical obstacle where there was none, converts an open avenue of approach into a kill zone, or can serve to channelize the enemy. It can be emplaced during times of tension without danger to the civilian populace.

- Strips away enemy mine-clearing attachments (i.e. plows and rollers). Therefore, the anti-tank ditch is especially effective when combined with mines on the friendly side — a real combat multiplier.

- Great for peacetime training — no need to simulate.

Combined arms team learns to appreciate the capabilities of one of its members — the combat engineers.

Team acquires the good habits of coordinating the location of obstacles, direct and indirect fire plans, security and logistic support. SOPs are developed, CEOIs are checked, signals agreed upon.



RECTANGULAR ANTI-TANK DITCH are better than triangular in clayey soil, but tougher to counter attack across.

Engineer capabilities become a vital part of the technical plan in both defense and offense. The defending commander plans his defense largely around emplacing the obstacle/barrier. "How long will it take to get that ditch across the valley? How many mines can we get behind it? We need it by BMNT!" Similarly on offense — "When we counterattack, put those CEVs and tank-dozer up front to breach that ditch ASAP."

During the ARTEPs, engineer resources were in constant demand by both the aggressors and the defenders — as it should be! The anti-tank ditch made believers out of the maneuver elements. No armored force worth its salt would stop in full attack for a strip of white "engineer" tape. But they don't run over an anti-tank ditch.

Planning Factors. Time of emplacement will vary with type of soil. In the rocky, clayey soil at Hohenfels, we found that two dozer scoop-loader teams (4 vehicles) could dig 400 to 600 m of ditch in 2-3 hours.

The deeper the ditch the longer it takes a tank to defeat it (by ramming the walls and breaking them down). A 1.2 m rectangular ditch provided a good two minutes of delay; a 1.5 m more gave about five minutes. The tactical play of the problem usually limited us to shallower depth because of the press of time. In the counterattack, the ditch delays the friendly force by about a minute. Less, if CEVs and tank-dozer are up front to breach by pushing in the spoil.

Conclusion. The anti-tank ditch is not the answer to the combined arms teams's prayer; it does not have (by itself) the awesome lethality of a minefield, nor is it as formidable as a blown multi-span bridge at flood-tide. It is an important tool for the combat commander and his engineer. It is a combat multiplier that can turn the tide of battle. It is the most realistic peacetime training obstacle that the combat engineer can provide for his combined arms team. Use it — you'll have fun!

COMPUTERS FOR THE ENGINEER COMBAT BATTALION

John E. Burke

The computer age has been with us for more than a quarter of a century. The minicomputer has stormed the markets during the last ten years. The Artillery, Signal, the Adjutant General, Finance, and the Quarter Master Corp, and others are well ensconced in the automation of their work. Where are the Combat Engineers?

There are Combat Engineers who don't appear to believe that the computer age is here to stay. Others don't believe the computer can be trusted to calculate the answers to mathematical problems without human intervention. There are some who believe they can do those calculations just as fast and accurately with the hand held calculator. Then there are others who feel Engineers should not jump on the band wagon of every new development on the market. In an age in which computers do calculations with electronic speed, military engineers must influence the action by

identifying what is needed. This isn't to say that there have not been efforts to automate the engineer battalions in the past. In fact, at the urging of the Engineer School, a battalion minicomputer was fielded in 1972 for testing with the 24th Engineer Group in Germany. The test was incomplete because the computer was not really tested at the battalion level. It was found however, that the need for a computer at the Engineer Group was a must, but the project died.

Currently through the efforts of the TRADOC Engineer, a WANG minicomputer is to be tested by the 20th Engineer Brigade at Fort Bragg, N.C. to determine its usefulness in the Engineer Combat Battalion. Two WANG computers were delivered to the Engineer School on 8 April 1977. They are being shaken down. Programs are being written. Operators and systems analysis are to be trained in Basic Language and other subjects associated with the use of these computers.

The Armor Engineer Board is charged with preparation of the test; the Engineer School with the writing of programs and documentation and the 20th Engineer Brigade with the actual field testing. The Engineer School will monitor the programs, making corrections as the battalions in the field identify the need.

The minicomputer can be used also for tasks performed by Combat Battalions that require computations. Some of these tasks are planning for minefields, barriers, and river crossings. The minefield program could identify various densities for anti-vehicle and anti-personnel mines, keeping track of the number of each type needed, and the number of each available and provide several options within the resources. The barrier program would do the same thing with the added features of providing information on the various materials available, the amounts available and the amounts needed to include transportation requirements. The river crossing program could keep track of river crossing resources, where they are located and the numbers of crossing vehicles needed etc.

There are other areas of application such as input data preparation for Siderpers, CSSS and other systems. The minicomputer could be used to update and print recurring reports, and to prepare requisitions for the S-4. It could be programmed to punch cards, used by many army systems as input media, thereby eliminating an error prone middle man key punch operator. Some will say that minicomputers used in such roles conflict with or duplicate other systems. Actually it would improve the input to these systems by elimination of the intermediate steps that breed errors. The minicomputer can be handled by anyone with little or no prior computer experience. The programs are generally written in a computer language called Basic. Officer attending the Advanced Course at the U.S. Army Engineer School have at least a working knowledge of the language. Most programs will be on the minicomputer when it arrives at the unit. The only modifications that might be needed would be those to suit the tasks of the individual commander or staff. Maintenance of computer equipment is usually by replacement such as in the Tacfure system where defective components are isolated and the entire defective circuit board is replaced.

The testing of the WANG minicomputer will probably duplicate a lot of the work done in 1972, but the movement is a step in the right direction. Hitching our future capabilities to the WANG mini should not be the aim of the test. The aim is improving the status quo by using a minicomputer which would increase our usefulness as military engineers and place us in the position of being able to provide our input to tactical plans with speed

equal to that of the other branches, as well as an ability to probe more options.

What is needed now is an objective look at the possible applications by the Engineer Combat Battalion in the field and to make these uses known to the Combat Developments Directorate at the Engineer School. Whether engineer battalions have access to a computer or not, their ideas on the various uses for a minicomputer should be useful for this test.

How the minicomputer can be utilized best still requires some thought and imagination on the part of military engineers everywhere. Its applicability to engineering design problems is obvious. Where it may take several hours, days, weeks or months to complete a design project, a good computer program can generate several different design options in a matter of a few seconds, minutes or hours depending on the complexity. Its uses in construction management are also well understood and used today by civilian firms and other services. (The Navy provided minicomputers to two of its C.B. Battalions more than a year ago.)

The minicomputer is not a multimillion dollar monster that occupies a room the size of a gym, which requires air conditioning, Mega Watts of power and a babysitter. On the contrary it is amazingly small, occupies about a 3' x 5' desk top and runs on a regular 110 volt current. It can operate in the same temperature range in which the human body can operate comfortably. When not in use can be turned off with little fuss than is normally experienced with a well behaved electric typewriter. The cost? Well, that like buying a new car — it depends on the options. For engineer needs the cost would probably run between \$15,000 and \$30,000 each.

Mr. John E. Burke retired from the U.S. Army Corps of Engineers as a Lieutenant Colonel in June 1960. He joined the U.S. Army Engineer School as an instructor in Construction Management. He introduced CPM, PERT, Automatic Data Processing subjects and other management tools into the school curriculum.

He has served as Chief of the Engineering Management Branch, Department of Military Engineering since December 1964 to date. He has been the recipient of many outstanding awards and the second highest civilian award—the Civilian Meritorious Service Medal for his contributions to the Engineer School.

He is a graduate of the George Washington university, holding a Bachelor of Arts degree and a Masters of Science in Public administration with area of concentration in Automatic Data processing.

RESTRICTED

ARMORED

DIVISION



CPT Stan Gray

The divisional engineer battalion has long played a vital role as a key element in the combined arms team. Within our capacities, as dictated by the organic engineer equipment present in the various type divisional engineer TOEs, we offer a wide range of capabilities to enhance the effectiveness of fighting units. However, recent advances in warfare technology have stimulated much reflection on our combat engineer system and how it can best contribute to the battle. The results of such reflection can be seen in examining the restructured Armored Division and its reconfigured engineer battalion, to be tested later this year at Fort Hood, Texas.

The recognized need for a restructured division lies in the dramatic changes in the complexion of the modern battlefield brought on by the continuing development and refinement of materiel, tactics and techniques by NATO and Warsaw Pact forces. This translates into heightened mobility with an emphasis on quick penetrations and shock effect; increased firepower due to massed armor formations and improved weapons technology; greater need for cover and concealment to avoid detection by more sophisticated surveillance systems; a lethality of weapons systems previously incalculable, and a war or conflict of possible short duration (prompting the "win the first battle" philosophy which dictates our current doctrinal re-evaluation). The proposed division features a greater number of smaller sized maneuver battalions with additional firepower integral to the division. It is an attempt to optimize and integrate the new weapons systems coming into inventory with the tactical concepts for modern warfare. The ultimate goal is to maximize firepower forward at the right place at the right time.

To assess the engineer role in this changing battlefield scenario, we will look at it through the conceptual framework of the division combat engineer system. This combat engineer system is comprised of all divisional and corps engineer units located in the division area. It contains those skills and equipment necessary to enhance the division's mobility, survivability, to counter mobility of opposing forces, and to accomplish general engineer work in the division area. The combat engineer system must be employed as far forward as possible to enhance the ability of the maneuver battalions to meet any engagement successfully. This calls for highly mobile engineer units with a capability of providing a flexible, quick, and effective response. Speed is of the essence! Modifications to the organic equipment found in the proposed divisional engineer battalion, as well as altered organizational structures, reflect this flexibility and mobility. At the same time, the

lethality of the engineer system has increased significantly. This will be examined in more depth later in the article.

The principal missions of the division combat engineer system are: **MOBILITY**, **COUNTER-MOBILITY**, **SURVIVABILITY**, and **GENERAL ENGINEERING**.

MOBILITY: Reducing or negating the effects of natural or manmade obstacles to improve movement of maneuver units and critical supplies. The mission demands quick and expedient methods to clear the way. The combat engineer vehicle (CEV) must be well forward, particularly when fighting in built-up areas. The complete removal or reduction of large obstacles will be the responsibility of follow-on engineers; the forward engineers must keep pace with their supported maneuver units to ensure continuous mobility.

COUNTERMOBILITY: Impeding the enemy, providing time, space and protection to friendly forces through the employment of obstacles. Although some obstacles are designed to destroy targets, most will be to enhance or complement other weapons systems. With the advent of the Family of Scatterable Mines (FASCAM), the nature of obstacle employment has been significantly altered. The most effective means today and in the foreseeable future of achieving countermobility is by reinforcing the terrain through the use of mines. Other obstacles producing means are planned for and emplaced as time and available resources permit; however mines are the single most effective means. The limited number of infantry and armor troops actually available in the emerging division organization to accomplish all combat missions demands that engineers must assume added responsibility in countermobility tasks. FASCAM makes this possible. (Figure 1) FASCAM provides "dynamic" obstacles having specific active lives before self-destruction which can be delivered in front of an advancing enemy by helicopter, ground dispensers, artillery, rockets, or ground units. It must be remembered, however, that FASCAM will not obviate the need for conventional minefields and other obstacles. The planning for and advice on the employment of all mine systems will still be the responsibility of the engineer, regardless of the method of delivery or execution.

Countermobility will also be achieved by the construction of strongpoints to deny key terrain to the enemy. Strongpoints may be platoon to battalion size, and the engineer must in their rapid preparation.

SURVIVABILITY: the development of protective positions. Engineers will provide the technical assistance and equipment to the forward

FASCAM CHARACTERISTICS

SYSTEM	DELIVERY	APPROX. MINEFIELD SIZE
M56	HELICOPTER (UH1H)	20 x (100 to 300) METERS PER SORTIE
ADATM/ADAPM	155 MM HOWITZER	250 x 350 METERS PER 12 ROUNDS
GEMSS	TOWED DISPENSER	60 x 1000 METERS PER LOAD
SLUMINE	ROCKET ON M548	300 x 1200 METERS PER 30 TUBES
GATOR	NAVY/AF AIRCRAFT	ALTITUDE AND SPEED DEPENDENT
MOPMS	HAND	35 x 75 METERS

ADATM: ARTILLERY DELIVERED ANTI-TANK MINE

ADAPM: ARTILLERY DELIVERED ANTI PERSONNEL MINE

GEMSS: GROUND EMPLACED MINE SCATTERING SYSTEM

SLUMINE: SURFACE LAUNCH UNIT MINE

MOPMS: MODULAR MINE PACKED SYSTEM

FIGURE --1

divisional units in creating defilade positions and protective shelters. Due to improved surveillance techniques possessed by the enemy, proper camouflage and concealment become more critical than ever before. The active defense will require the engineers to provide for quick, yet well concealed movement within friendly lines. To maintain favorable combat power ratios, the survivability of vital weapons systems and personnel must be ensured. The upcoming Universal Engineer Tractor (UET) will provide engineers with a must more responsive and less vulnerable earthmoving capability for digging in units. Since the emphasis of division engineer units will be on the preparation of forward defenses, corps engineer assets must be tasked to dig in the remainder of the division area.

GENERAL ENGINEERING: providing support to units and activities in the brigade and division rear areas. This will be the prime consideration of corps engineer units. Among their duties will be maintaining essential supply routes, replacing assault or blown bridges with tactical bridging, installing POL pipelines, conducting ADM missions, and developing forward support areas for rearming/refueling.

Although these are the "engineering" missions of the division combat engineer system, engineer units also have the mission to fight as infantry. This has been and continues to be, one of our missions. However, due to the loss of essential engineering capability in the division forward area, engineers should be committed as infantry only when the tactical situation deems it neces-

sary. Such occasions are more probable in the defense than in the offense. The engineer unit has limited inherent fire power (the main anti-tank assault weapon system will be the M47 DRAGON, assigned two per line platoon). This calls for further augmentation from division assets such as indirect fire support, forward observers, tanks, and additional anti-tank weapons. It is more likely that specific engineer companies or elements will be committed to infantry combat operations of limited area/mission, rather than the entire battalion as a unit, and unit integrity will be maintained.

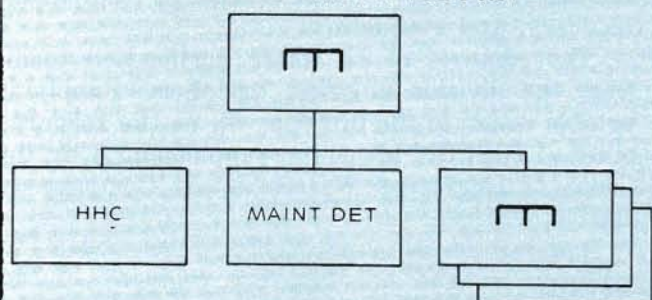
Now we will analyze the actual division engineer organizations as they will be tested in the restructured Armored Division. The 1977 model (Figure 2) is based on equipment and weapon systems presently found in the engineer inventory, reconfigured to best accomplish the missions of the division combat engineer system. The 1980's Figure 3 model illustrates the integration of several currently-projected weapon systems and items of equipment to be fielded after 1980.

Analysis of the two models indicates a number of salient features about the engineer organization's future capabilities and concept of operation. Major aspects of change include:

The elimination of a bridge company and some heavy equipment items currently found in the TOE 5-145H series. Except for the AULB, all bridging and rafting capability has been shifted from the division combat engineer battalion to Corps units. (Each armor battalion in the heavy

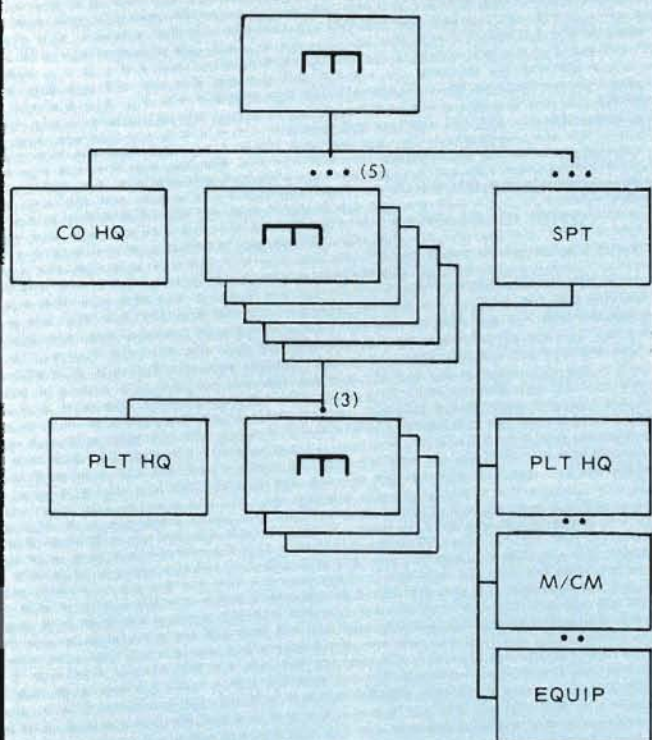
1977 MODEL

ENGINEER BATTALION TOE 5-835T



	PERSONNEL	OFF	WO	EM	AGGR
BATTALION	37	1	731	769	
MAINT DET	1	2	101	104	
TOTAL	38	3	832	873	

ENGINEER COMPANY TOE 5-837T



	PERSONNEL	OFF	WO	EM	AGGR
	8	0	203	211	

SUPPORT PLT M/CM SEC

- 2 AT MINE DIS (M57)
- 1 AVLB
- 3 CARRIER M548
- (2 M173 ROCKET PRO-PELLED LINE CHG)

EQUIP SEC

- 1 TRACTOR D1
- 2 LOADER 2½ CY
- 2 BARRIER

CO HQ

CARRIER M577

5 ENGR PLT

- 15 CARRIER M113
- 5 LOADER 2½ CY
- 10 DUMP TRUCKS
- 5 CEV
- 5 D7 DOZERS
- 5 10T TRACTORS
- 5 25T TRAILERS

FIGURE — 2

division has two AVLB's.)

A slightly lower battalion strength (the present TOE 5-145H level I personnel strength is 984 men), yet considerably larger company-sized units.

Reconfiguration to three line companies, each having five line platoons and one support platoon. A line platoon will have three 8-man squads. This has been done to facilitate the integration of engineer capabilities with the proposed five maneuver battalions of a heavy division brigade. It allows normal association of one engineer platoon per maneuver battalion, thus enhancing the relationship with the integration of division engineer units and their maneuver unit counterparts. The engineer assets may be shifted at any time to meet critical situations within the division forward area. The support platoon, divided into a mobility/countermobility section and an equipment section, will provide needed equipment and systems to the line platoons on a task basis.

Lessening of generalized engineering roles for the divisional combat engineers. In the mobile battlefield, particularly the active defense, the volume of engineer tasks in the forward area, demands the utilization of all engineer assets in a direct support role. (Engineers will be attached to maneuver units only when time and/or distance factors prohibit control by the parent engineer unit.) Corps engineers will undertake most general engineer missions in the division area. As a result, a minimum of two Corps combat battalions can be expected to be located forward of the division rear boundary; an additional Corps combat battalion and one combat heavy battalion in the Corps area will be allocated for each committed division. However, there will be only one point of contact for all engineer systems employed in the division, the division engineer.

A more specific role in mobility/counter-mobility. The addition of GEMSS, SLUMINE/SLUFAE, and the UET in the 1980's will further enhance the engineers' capabilities to perform this mission.

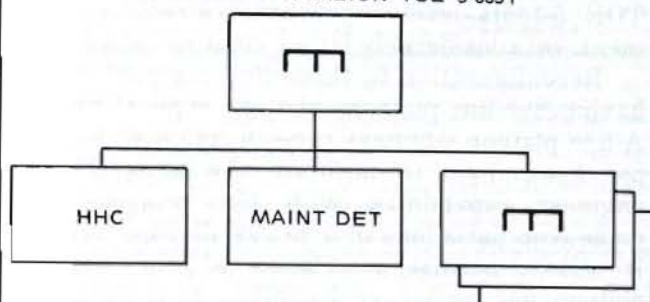
An increase in number of CEV's to the line companies, for enhancing defense, assaulting fortified positions and bunkers, clearing rubble and other obstructions, and for limited slot dozing.

Greater cross-country mobility of engineer units, primarily with the addition of the UET. This will allow the engineers to keep pace with the maneuver elements with improved survivability. Although dozers, bucket-loaders, and dump trucks possess cross-country movement capability to some degree, they do put constraints on the mobility of engineers units. The UET of the 1980's model greatly solves the current problem.

The consolidation of all battalion organization maintenance under an Ordnance Maintenance De-

1980's MODEL

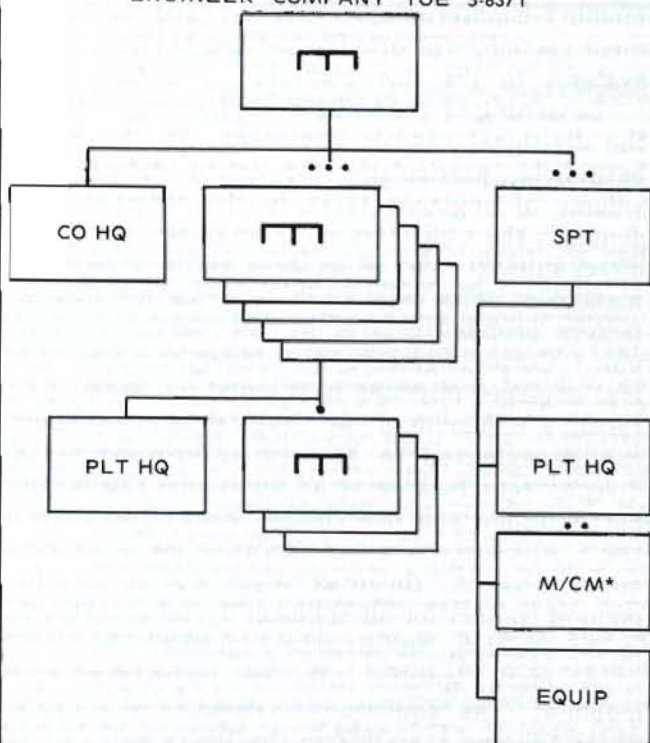
ENGINEER BATTALION TOE 5-835T



PERSONNEL OFF WO EM AGGR

BATTALION	37	1	704	742
MAINT DET	1	2	94	97
TOTAL	38	3	798	839

ENGINEER COMPANY TOE 5-837T



PERSONNEL OFF WO EM AGGR

8	0	194	202
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SUPPORT PLT M/CM SEC

- 2 SLUFAE/SLUMINE
- 2 GEMSS
- 1 AVLB
- 3 CARRIER M548

CO HQ
CARRIER M577

EQUIP SEC

- 1 UET
- 2 LOADER 2½ acy
- 2 EXCAVATORS**

5 ENGR PLT
15 CARRIER M113
10 UET
5 CEV

* M/CM — MOBILITY/COUNTERMOBILITY

** PRECISE CONFIGURATION/NOT YET IDENTIFIED

FIGURE — 3

tachment, which will retain company support teams for the engineer companies. Company team maintenance operations will be limited to organizational services, minor repairs, battlefield recovery, and evacuation.

The removal of all water purification teams from the division engineer battalion. Supplying potable water to the division will be the responsibility of DISCOM elements, supplemented by the Corps of Engineers Water Supply Company as needed.

Removal of the equipment platoon from the headquarters and headquarters company of the division engineer battalion made possible by the addition of a support platoon to each line company, and the removal of most heavy equipment from the battalion.

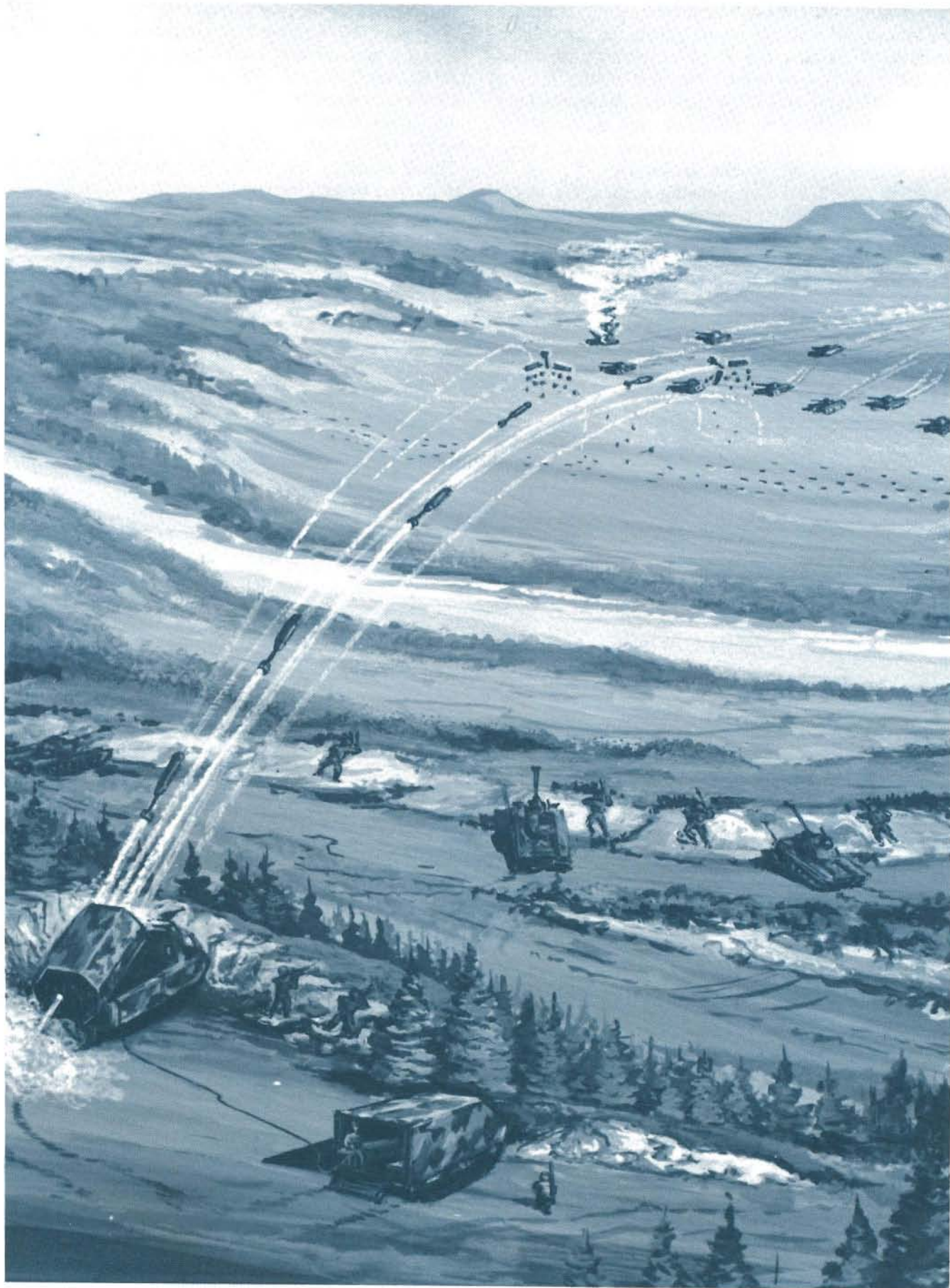
The removal of all Atomic Demolition Munitions (ADM) missions from the division engineer battalion. This responsibility will be assumed totally by the Corps ADM Company.

The addition of a division support element from the theatre army topographic battalion, collocated with the ADE at division headquarters. This element will be responsible for providing military geographic information to the division.

Brief mention should be made of the several new weapon systems and equipment items to be introduced in the 1980's as organic to the division combat engineer battalion. This will serve to enhance the reader's perspective of the vastly expanded capabilities and combat engineer system will soon possess.

SLUFAE: A fuel-air explosive which will increase the engineer's capability to rapidly breach minefields and enhance maneuver, and to attack bunkers and built-up areas. A launcher containing 30 tubes will be mounted on the M548 cargo carrier. It has a maximum range of 1,000 meters and breaches a path 8 meters wide by up to 300 meters long.

SLUMINE: A dynamic mine emplacement system capable of placing self-destructing mines into enemy-held or contested terrain. SLUMINE utilizes the same launcher as SLUFAE. With a delivery range of up to 5,000 meters, SLUMINE is capable of emplacing a minefield 300 meters by 1,200 meters with a single salvo. Thus it provides the engineer the ability for very rapid mine-laying response to a critical tactical situation. This system should be fielded in 1981; there is no present substitute for SLUMINE.



GEMSS: A system which will rapidly emplace anti-tank and anti-personnel mines in areas controlled by friendly forces. Mounted on a modified M-794 trailer, (see below) GEMSS consists of a drum containing 800 mines, and can lay a minefield strip 60 meters wide by 1,000 meters long per drum load within 15 minutes. Minefield composition can be pre-set by the loader(s).

MOPMS: A mine dispensing system for hasty protective minefields, to close gaps and lanes, and to point mine obstacles: MOPMS will be part of the basic load of all units, and is expected to reach

the field in 1982. Each box will contain 20 anti-tank and 10 anti-personnel mines, designed to create a minefield up to 35 meters by 70 meters.

Other FASCAM systems expected by the 1980's, not organic to division engineer units but which come under the planning guidance of the engineers, include ADAPM/ADATM and GATOR. These systems all utilize self-destructing mines delivered by artillery or high performance aircraft. The M-56 helicopter-delivered mine dispensing system, currently available, will also be continued.





UET: Will provide a highly mobile earth-moving capability, used for the preparation of battle positions and strongpoints, and for improvement of combat routes and trails. It will replace the scooploaders and dump trucks in the line platoons, and the D7 dozers in the support platoons. The UET will make the engineer platoon of the 1980's more compatible with the maneuver task forces for cross-country movement.

There is no guarantee that the restructured Armored Division in its present untested form has optimized the full capabilities of the various weapons systems and organizations comprising the combined arms team. Only with extensive evaluation, field testing and adjustments to the struc-

ture, will that question be answered. Likewise, there may be modifications made on the division combat engineer system, as it has been defined and described in this article. Some real issues to be evaluated include command and control relationships between supporting and supported units, interaction of corps and division engineer assets (with corps now retaining almost all bridging capability), and the degree of mobility-counter-mobility-survivability afforded by the engineers. These questions will take considerable time and extensive field-testing to be accurately answered. What can be guaranteed, however, is that the combat engineers will continue to influence the course of future battle.

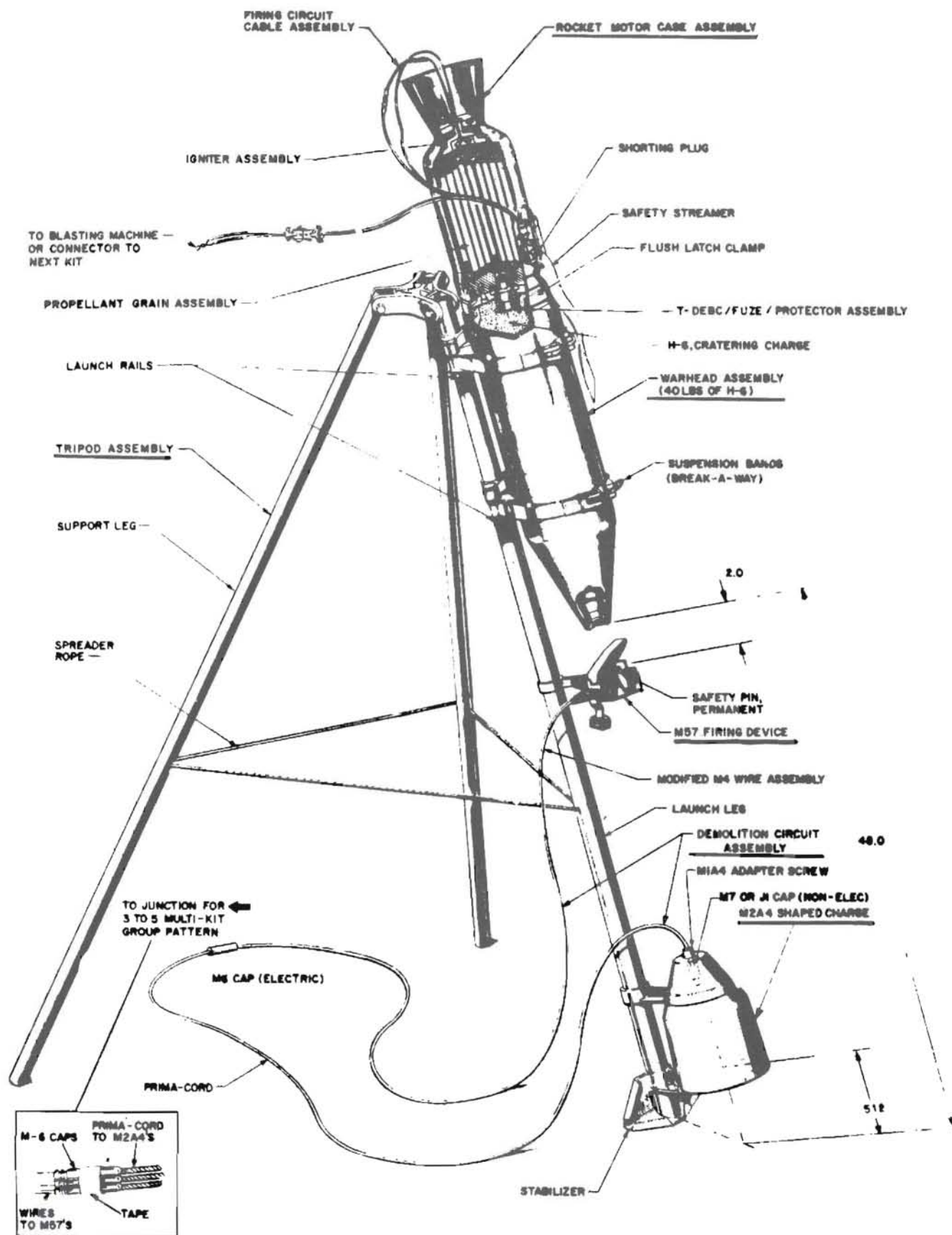


Late this year the most significant development in engineer obstacle support capability since World War II will reach field units. The M180 Demolition Cratering Kit will provide a rapid means of creating craters in any surface. A two man team can effectively crater a 30' roadway in twenty five minutes using the M180 Kit; a task which normally takes a full engineer squad more than two hours to complete.

The M180 Demolition Cratering Kit consists of an M2A4 shape charge, an M57 electric firing device, a warhead, a rocket motor, a tripod and a demolition circuit (Figure 1). The shape charge, firing device and warhead are permanently attached to the launch leg of the tripod; the rocket motor and demolition circuit are connected during emplacement. Ignition of the rocket motor starts a chain reaction, moving the warhead down the tripod leg, actuating the firing device and, in turn, initiating the demolition circuit of the shape charge. The rocket motor drives the warhead into the hole blasted by the shape charge. At optimum depth, the delay-type blasting cap detonates the warhead to form a crater.

The utilization of the M180 Demolition Cratering Kit is a marked departure from the laborious, time consuming and logistically demanding conventional methods of subsurface explosive emplacement used by engineers since World War II.

Development and testing of the M180 Kit began in 1963 at Picatinny Arsenal. Subsequent testing and evaluation was conducted at Fort Knox, Kentucky, Fort Bragg, North Carolina and Yuma Proving Ground, Yuma, Arizona, using a wide range of environmental conditions, soil types and kit configurations. Crews of varying experience and training were used to effectively evaluate the human factors engineering of the kit. The primary goal of the testing was to determine if the M180 Kit could consistently produce an effective crater. Doctrine defines an effective crater as one which denies passage to wheeled vehicles and forces tracked vehicles to make at least three passes while trying to traverse it. In order to meet this criteria, the test requirement further established that one M180 Kit should be able to produce a crater fifteen feet in diameter and seven feet in depth with thirty degree side slopes.



DEMOLITION KIT, CRATERING: XM180

FIGURE - 1

Testing showed that the M180 Kit was most effective when employed in a series of three or five kits.

SAMPLE TEST DATA

Number of Kits	Depth (FT)	Diameter (FT)	Width (FT)	Length (FT)	Soil Type
1	5.0	26.5			Sandy Clay
*1	2.4	20.3			Sand
1	7.7	25.9			Compact Clay
1	7.2	25.0			Compact Clay
3	8.8		36.0	36.0	Sandy Clay
3	6.7		31.0	24.0	Clay
3	10.4		35.0	35.0	Clay
3	8.0		32.6	34.4	Clay
*5	4.0		30.0	26.0	4 ft of gravel over granite
5	5.9		31.7	32.0	Sand
5	13.0		42.0	39.0	Clay
5	11.4		40.6	39.6	Clay

*Failed to meet criteria for an effective crater.

FIGURE - 2

It was found that the size, shape and effectiveness of a crater is directly dependent on the soil conditions. While the M180 Kit can produce craters in all soil types, those attained when the kit was employed in sand or bedrock were not consider effective.

The emplacement time during testing was excellent. The times for two man crews using packaged kits were 3-5 minutes for one kit, 15 minutes for three kits and 25 minutes for five kits. Further testing revealed that on-site times may be significantly reduced if kits are pre-assembled prior to arrival at the target location. In addition, use under blackout conditions had little effect on emplacement; extending the times by only three minutes for the five kit configuration. These rapid emplacement times were achieved by soldiers who had a basic working knowledge of conventional demolitions and a brief familiarization with the kit. No special expertise or training was required.

One shortcoming disclosed by the tests was that the standard ten cap blasting machine, organic to combat engineer units, was not sufficient to detonate a series of M180 Kits. Fifty cap blasting machines were needed to secure reliable results.

As stated earlier, the test results showed that the M180 Kit was most effective when employed in series against well compacted, cohesive soils. This includes its employment against asphalt and concrete surfaces overlaying these type bases. When employed in a series, all kits are detonated simultaneously. It was found that a diagonal pattern across the surface produced the most effective craters. Proper employment of the M180 Kit in standard three and five kit configurations is shown in Figure 2.

The M180 Demolition Cratering Kit's capability of quick emplacement allows for the rapid deployment of craters to enhance offensive, defensive and retrograde operations. Rapid employment of craters is not even considered using current techniques. Although no testing was conducted using the M180 for other missions, evaluators fret that it could easily be employed in a vertical mode against bunkers, tunnels and bridge abutments. The kits use may be limited only by the imagination of the using engineer. Field use and training, beginning this fall, will provide a great deal of information concerning its total capabilities.

The M180 Demolition Cratering Kit does have several significant advantages over the present system:

- It may be rapidly emplaced by two soldiers (3-5 min/kit).
- It is simple to emplace under blackout conditions.
- Little training beyond a basic knowledge of conventional demolitions is required.
- Its simplicity facilitates its use by non-engineer troops.
- No surface preparation is required.
- It requires 40% less explosive than current methods.
- It can be pre-assembled for retrograde and reserve target use.
- M180 craters are just as, or more, effective than those made by other means.
- The M180 crater is a one-step operation.
- All explosives are contained in one kit.

The M180 Kit greatly enhances the engineer's ability to support operations on the modern battlefield. Full advantage should be made of this revolutionary cratering capability to stimulate all phases of the engineer support role.

CPT Willis and CPT Sanford are currently working on Master of Science Degrees at the University of Illinois, Champaign-Urbana. They have both commanded Combat Engineer companies and are recent graduates of the Engineer Officer Advanced Course.

A TIME IN HISTORY

The 978th Engineer Maintenance Company.

Theron P. Snell

Born to fill a need generated by Modern War, the 978th Engineer Maintenance Company was activated on 5 November 1943. From the beginning, the 978th was the product of a military checkers game. The cadre of enlisted men came from the 475th Engineer Maintenance Company in Iceland. One officer was assigned from the 972nd Engineer Maintenance Company, North Carolina, while Captain H. R. Farrell the company commander was assigned from the 567th Engineer Dump Truck Company in Illinois. This skeleton crew came together at Camp McCoy, Wisconsin where five more officers joined them from the Engineer School at Fort Belvoir. Some of the enlisted men needed to complete the TO/E dribbled in from various parts of the country. The roster was completed on 28 January, 1944, when 144 enlisted men dropped in from Camp Haan, California. The resultant company was a strange group of cast-offs, misfits and extra hands. The first formation at McCoy looked like a rainbow as it lined up. Among those in that line were ex-antiaircraft artillerymen, ex-tankers, Pacific combat veterans and even a few who had been at Pearl Harbor on 7 December 1941.

By February, 1944, the company, under a new Captain, Harry H. Ingraham, finally gelled — not necessarily with unit pride — but they gelled. As a lieutenant in the Company wrote in 1945, there was a deep rivalry between line outfit men and engineer-trained men. Those who had seen combat or had had combat training thought combat should be stressed, while the Engineers saw the company mission as being one of highly trained technical support. Many men with line outfit ratings were promoted to technical ratings and then broken when they obviously couldn't play their new roles. The end result of this bickering was an elimination of line non-coms and the failure to achieve, the first time, an overseas fitness rating.

Be that as it may, the 978th did do good work once they had the chance. As a newspaper recorded at the time, the 978th showed its mettle at McCoy when it repaired the post steam-shovel — utilizing the Company's mobile shops and testing its organization. Since, as Captain Ingraham said at the time, the job was similar to the jobs it would face in the combat zone, the 978th learned a lot and settled into a fine working

outfit, unified not necessarily by internal harmony but by the job they, as a group, had to do.

The "job they had to do" was the maintenance of Engineer equipment and direct maintenance support of units actively engaged in combat. They did it while attached to the 1104th Engineer (C) Group, XIXth Corps, 9th Army in Europe. The 978th provided this service not only for engineer units but also for Infantry HQs, field artillery units, medical units and others. Adapting itself to the needs of war, the 978th also performed duties ranging from transporting Allied POWs to evacuation centers to providing military government and being the initial occupation forces in towns bypassed by armored spearheads. The 978th proved to be born of modern war and completely adaptable to its needs.

This is not to say that the 978th was a jack-of-all-trades. It wasn't. It was a highly skilled outfit that was able, because of the ability of its personnel, to meet novel situations and to come out ahead. In the process, the Company suffered 5 wounded and earned a Meritorious Service Unit Plaque, as well as numerous commendations, for its actions during the Bulge, plus the Roer and Rhine River Crossings. Its normal mission necessitated the Company's personnel working on their own — allowing the individual ability of the men to best be utilized. Moreover, crews of 3 to 10 men would travel all through Corps areas repairing, checking and servicing equipment. These crews would be gone for days, thus putting them on their own. These independent missions gave the impression that the company was organized around the job, not its unit designation. In other words, the company, faced with small independent jobs, had to be made up of small and independent units. The cohesion came where it was needed — in the dedication to the job at hand and in the collective skill needed to carry it out.

Finally, it should be pointed out that, while the outfit did not win the war single handed, it did perform a vital role in a modern army. Direct maintenance support of combat elements was needed if the mechanized, motorized army was to carry out its mission of defeating the enemy. The 978th did that well. It was able to convert the potential draw-back of its checker-like origin into an asset as it trekked through Europe and into the Pacific.

BRIDGING

EQUAL OPPORTUNITY PROGRAM

The policy of the Army is to provide equal opportunity and treatment for its soldiers and their dependents. Equal Opportunity (EO) means equal consideration and treatment based upon merit, fitness, and capability.

A policy such as this fosters teamwork and esprit de corps. To further contribute to this policy, the Army has revised its AR 600-21, "Equal Opportunity Program in the Army."

GENERAL

The revised regulation goes beyond focusing on race relations. It targets good relationships among all soldiers, regardless of race, color, sex, religion, age or national origin.

The changes reflect a continuing interest in upgrading the Equal Opportunity Program.

The regulation requires major commanders to become more involved in developing and carrying out their own EO programs.

Besides active Army troops, the regulation also applies to members of the National Guard when called to active federal service. It also applies to members of the Army Reserve when serving on active duty, on active duty for training, or in an inactive duty training status.

The training portion of the Equal Opportunity Program has been broadened to make it more adaptable to local situations and to strengthen relations among all groups.

Commanders must tailor the training to their units' needs and may use their own judgements as to the frequency, length, method, and the topics to be covered.

RESPONSIBILITIES

The chain of command will be the primary channel for communications equal opportunity matters.

The Deputy Chief of Staff for Personnel (DCSPER) at DA level has general staff responsibility for all plans, policies, and actions pertaining to the Army Equal Opportunity Program. The Director of the Office of Equal Opportunity acts as the principal staff assistant and advisor to the DCSPER.

Commanders are responsible for training their units in equal opportunity, just as they are for other subjects. Members in the chain of command, including supervisors, will participate in equal opportunity sessions as instructors and discussion leaders.

Staff EO personnel will not be assigned further duties in other human development areas such as drug and alcohol abuse programs.

The EO staff members will function as those of any other section within the command. Command channels will be used in working with EO staff officers in the next echelon of command.

AFFIRMATIVE ACTIONS

Affirmative Actions are those efforts by the Army directed toward assuring that each soldier is afforded an equal opportunity to advance in his or her military career.

Affirmative Actions include identifying and eliminating all discriminatory practices within the Army. They are the keystones of the Equal Opportunity Program.

The regulation calls for an environment in which each member is offered impartial treatment at all times. Commanders must now develop plans and follow-through to achieve that goal.

Equal opportunity is everybody's business. The revised regulation reflects this view. For example, new emphasis has been placed on the Equal Opportunity role of all commanders and staff officers and not just on the Equal Opportunity Officer.

More than any other single feature, the revised regulation is designed to continue strengthening the Equal Opportunity Program.

THE GAP

SPONSOR PROGRAM

Moving around in the Army can be a hassle. Orders to another post means packing and moving out, finding a new place to live, locating new schools, getting shots and digging up the kid's birth certificates—over and over again.

The Army has a program which can take some of the hassle out of moves. It's known as the sponsor program and it works if a soldier takes advantage of it.

Commanders are required by AR 608-7 to make their soldiers aware of the program, yet a survey two years ago showed that 40 percent of soldiers had never heard of the program; 78 percent of the enlisted soldiers said they had not been encouraged to participate in the program. DA officials stress that the responsibility for getting the message to the troops about the importance of the sponsor program lies with the commander.

The losing command is expected to issue a copy of DA Form 3922 to each departing soldier within seven working days after assignment orders are received. The first part of the form is filled out by everyone. If you elect to have a sponsor from your next unit, simply fill out the second part of the form. A copy of that form is then sent to the gaining unit and the wheels of the sponsor program begin to roll.

The gaining unit has a fixed number of days to accomplish certain things after receiving the form. First, a sponsor is appointed; the sponsor should be of equal or higher rank, and the same sex, marital status and professional specialty as the person being sponsored. Second, a welcoming letter should be sent by the CO along with a locally produced information packet. The newcomer is informed about such things as government and civilian housing, schools, household requirements, climate and recommended clothing, along with any other information that might help a soldier and his family adjust to the new location.

The sponsor should send a letter with home address, duty and home telephone numbers. The letter should include the number of the housing referral office as well. The newcomer should be furnished with a map of the area and should be advised that he or she will be met by the sponsor upon arrival at the new post.

There are many bits of information that a sponsor can provide. For example, some countries (and states) do not allow personal weapons or gun collections. Some countries do not allow automobiles made after a certain year into the country; some areas do not have unleaded gas. Restrictions on exotic pets and quarantine lengths can become major problems for a soldier who knows nothing about them. Some overseas posts may not be able to provide certain necessary furnishings. The sponsor can pass along that kind of information.

The sponsor should accompany the newcomer during in-processing at the unit, finance office, family housing office, the Army Community Services Center, vehicle registration, etc. Along with this, an introduction to coworkers and a tour of the post and local area will do much to make the newcomer feel at home.

Dispelling fears and false impressions the newcomer may have will make transition from one post to another happier and simpler for the soldier. Commanders can make the sponsor program a real "people program," but it can work only if soldiers understand it and use it.



FLIGHTS OF FANCY

How many soldiers imagine visiting exotic places while on leave? Ideas of flying to far-off Spain, England or the Middle East may intrigue the soldier with pay in hand and leave on the books.

There are ways to see the world without blowing three months' pay if the traveler is willing to plan well in advance. Among the ways to travel for less money are Space Available (Space A) on military aircraft, Advanced Booking Charters (ABCs), and Overseas Military Personnel Charters (OMPCs).

Space A travel can help soldiers take their dependents on trips anywhere except in the continental United States. The soldier may catch flights from the US to an overseas destination, or from one overseas destination to another. Space A on military aircraft is free air transportation. The Military Airlift Command (MAC), which handles most flights, does, however, charter commercial flights to meet part of its military requirements. Passengers who fly Space A on MAC charters must pay a \$3 federal tax and a \$2 surcharge.

All Space A travel works the same, though, and here are the basics:

- the soldier must appear at the MAC terminal Space A counter in Class A uniform, and must present a valid ID, an up-to-date shot record (International health Record), a DA Form 31 showing authorized leave and, when required, a passport
- dependents must be accompanied by sponsors, must show IDs, and must present shot records and passports
- each traveler is authorized 66 pounds of luggage
- soldiers may request up to five destinations when they sign in on the MAC Form 53 for Space A transportation; space on a flight is never guaranteed, but a traveler may elect to accept a flight going to a destination that can be used as a jumping off point to another

PATIENCE PAYS

After seats needed for official military business are filled, Space A passengers grouped into four categories are seated in those remaining. Seats are given out within the categories on a first-in, first-out basis—date and time of sign-in are important. Here in general terms are the four categories:

- Cat One: dependents of military members, civilians and their dependents on emergency leave (active members on emergency leave go Space Required)
- Cat Two: accompanied or unaccompanied military members on ordinary leave
- Cat Three: dependent students
- Cat Four: retired military personnel and their dependents

Space A calls are made 1½ hours before a flight, and anyone who does not answer is dropped from the list. It pays to stay close and listen because there may be last minute openings making available seats not open during the first call.

There are disadvantages. Travelers are sometimes caught in MAC terminals for days when space on flights to selected destinations is unavailable. Sometimes passengers actually get seats and then are bumped in favor of persons or things with a higher priority. Travelers may end up taking commercial flights at unexpected expense and should carry sufficient funds to cover the trip back to their respective duty stations. Bear in mind that a soldier traveling alone is far more likely to catch a military hop than a soldier traveling with dependents.

COMMERCIAL CHARTERS

Traveling on commercial charter flights has fewer built-in problems than Space A. Charters are not free, but neither will a soldier spend time in terminals using up leave that could be spent at the destination.

Use of Advanced Booking Charters and Overseas Military Personnel Charters Requires planning; and the savings in time and money are usually worth the effort. Applications must be made a month or two in advance of the scheduled trip. Flights are economical, saving about 30 percent over fares on regular commercial flights, and the soldier's money is protected because each charter must be accepted by the US Civil Aeronautics Board. Send applications early—after application deadline seats usually are not available.

OMPCs are scheduled specifically for military members and their immediate families stationed overseas and may be purchased as one-way fares. ABCs must be booked for the round trip and are available to CONUS-based soldiers and their families.

Soldiers may fly on charters to and from specific destinations and try to get Space A flights to other places during the leave period. For instance, a charter to Germany would save time. Once in Germany, soldiers could sign up for Space A seats to make interesting side trips. Flights from the MAC terminal at Ramstein, Germany, go to Spain, Greece, England, North and East Africa, Italy, Scandinavia, and the Middle East. It is still important to remember that Space A seats are usually very limited in number.

Whatever the decision, ABCs, OMPCs or Space A all the way, soldiers and their families can, with patience and planning, make dream vacations realities.

GETTING AWAY FROM IT ALL

There are many ways that a soldier can be absent from his job, most of them legal.

The most common form of absence is ordinary leave. Every soldier is authorized 30 days of leave a year, accrued at the rate of two-and-a-half days a calendar month.

DA policy encourages soldiers to take leave just about anytime they wish unless to do so would interfere with the unit mission. Soldiers may even request leave in conjunction with Temporary Duty (TDY) but must insure that military transportation is used only for the TDY portions of their travel.

- Advance leave. If a soldier uses all of his or her accumulated leave and needs more time to take care of an emergency or personal problem, the commander may authorize up to 45 days advance leave. This leave will be taken from possible future accumulated leave.

- Excess leave. If a soldier faced with an emergency doesn't have enough ordinary and advance leave, the commander can authorize excess leave until the emergency is taken care of. The maximum combined leave that the soldier is allowed is 60 days (ordinary + advance + excess). Soldiers will receive no pay and allowances while on excess leave. Of course, excess leave will not be deducted from accumulated leave balances.

- Convalescent leave. Commanders may authorize convalescent leave to soldiers under medical care not fit to return to duty. Convalescent leave is not chargeable to accumulated leave.

- Environmental and Morale leave. Soldiers stationed in areas of extreme hardship overseas may be authorized environmental and morale leave. This is deducted from accumulated balances as ordinary leave.

- Rest and Recuperation leave (R&R). R&R is authorized from hostile fire areas where ordinary leave is not possible. R&R is charged against balances as ordinary leave.

Passes are not counted as leave and may be authorized for up to 96 hours. A regular pass is not issued for more than 72 hours (3 days). A 96-hours pass may be granted by commanders on special occasions or in special circumstances such as:

- compensation for extra work ("comp-time").
- compensation for long or difficult deployment from home station.
- compensation for duty in an isolated location where normal passes are inadequate.
- Special recognition for exceptional performance, such as Soldier of the Month, Year, etc.

A pass may not be combined with a holiday period, nor may a 96-hour pass be combined with a regular pass or holiday period when the length of the time off exceeds 72 hours.

Other types of authorized absences include:

- "Administrative Absence" which may include permissive TDY and is not chargeable as leave. Some of the cases where Admin leave may be granted include: attendance at meetings which deal with military duties; attendance as a member of the Board of Directors of a DoD credit union; participation in competitive sports events; attendance in response to a subpoena, summons, or jury duty; and participation in other official or semi-official programs of the military where TDY or TAD is not appropriate. These programs must enhance the soldier's value to the military or increase the soldier's understanding of the service.

- "Proceed time" is not chargeable as leave and is authorized for the preparation of PCS orders for soldiers entitled to transportation of dependents or shipment of household goods.

Leave and pass are one of the many benefits that the soldier is entitled to. In all cases it is the commander who determines what type of absence the soldier is authorized. There are very few civilian firms that allow employees 30 days vacation a year, and the soldier should take care not to abuse the leave and pass system.

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