Engineer

Winter THE MAGAZINE FOR ARMY ENGINEERS 1981–82



TERRORISM:
The Growing Threat

UNITED STATES ARMY ENGINEER CENTER AND FORT BELVOIR, VA

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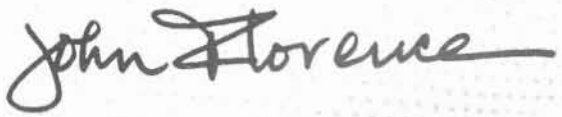
Editor's Notes

Our cover story on page 14 begins with an allusion to the difficulty in accurately defining terrorism. Fleeting as that description may be, terrorist incidents have become a fact of life (and death) in many areas of the world. As international terrorist activities directed against the United States increase, so does the Army's involvement in combating the threat. *U.S. Army Overview FY82* carries a "Spectrum of Conflict" curve showing a dead heat between terrorism and unconventional warfare as the most likely type of future conflict involving the Army. That's worth noting. So are the lecture comments of Rudolph Levy who warns that one of the greatest dangers facing the Army during its growing involvement in combating terrorism is, in fact, understanding the threat. (Levy's review of *The Terror Network* appears on page 18). We hope our feature on terrorism provides you useful information on this complex topic.

As your new editor, I begin my tenure bearing the proverbial good news and bad news. The positive first: Sp5 Nancy Lang, who did a superb job in singlehandedly putting out the Spring and Summer '81 ENGINEER, will remain on the staff. Nancy's dedication and many talents are a boon to all of us. The DA Periodicals Review Board supplied the bad news: significant reductions to an already threadbare ENGINEER budget. The board admonished that further cuts at DA level means they "may have to discontinue such journals" as ENGINEER.

Somewhat in this issue and particularly in those following, you will see us economizing—fewer pages, less color and possibly a move to a cheaper, uncoated paper.

I look forward to meeting many of you in the coming months and to receiving your comments, criticisms and, most importantly, to your continued support with the timely, informative articles that have marked ENGINEER as an outstanding branch journal.



Engineer

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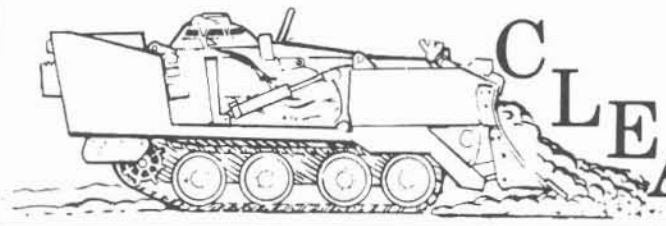
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CLEAR THE WAY

by Maj. Gen. Max W. Noah

The Engineer Mission

From time to time, we Army engineers must reflect on our basic reason for existence so as to better focus our efforts in concepts, doctrine, training and materiel. Further, we need to pay attention not only to what we contribute to the Army mission, but also how we contribute. We need to look closely at both the substance and spirit of this—our DOCTRINE.

What? The U.S. Army Corps of Engineers is a combat arm. One way to express our mission is, we work on modifying the terrain, facilities and environment in which we fight, work and live—all efforts toward the ultimate goal of enabling the Army to win in battle. Functionally, we concentrate on battlefield arenas which deal with enhancing friendly mobility, countering enemy mobility, providing physical protection, constructing and maintaining all types of facilities and providing topographic analysis and information. These functions entail a wide spectrum of tasks in support of the maneuver units, the fire support elements or the logistical commands. Finally, when we are needed more in the firefight than we are in pursuing engineer tasks, we join the maneuver elements in the up front battle fighting as infantry.

How? The manner in which we provide engineer support is critical to mission success, and it is here that we often need to concentrate our efforts. We always strive to provide high quality support. To do this requires skill, knowledge and understanding in two distinct areas—first, knowing what the commander wants, and second, knowing the technology and operational techiques of getting the job done.

The first area, determining needs and desires, is probably more of an art than a science. Success in this depends upon a myriad of factors, such as type of unit, type of mission, personalities, time, etc. In most cases, success is enhanced by long-term, close relationships between the engineer and his supported commander. The commander's style, likes, dislikes and needs are best learned at close hand. For this reason we habitually assign an engineer on the staff of the commander, to plan, coordinate and direct the engineer tasks in battle. He should do that in a deliberate, aggressive manner and not wait for someone to tell him what to do. Further, we normally "double hat" the assigned engineer to serve as both the staff engineer and commander of the organic engineer unit, e.g., at division, corps, etc. At maneuver brigade level, we are currently evaluating how we will provide a reasonable engineer planning and directing capability, taking into account that the engineer company commander normally supporting the brigade usually has enough to do running company operations without having to tack on brigade engineer planning functions.

Because of the factors discussed in the preceding paragraph, it should be the rare exception, rather than the rule, that assigned unit engineers are replaced because of attachment or "OPCON" of another engineer unit to the parent unit. This issue most often comes into play when an engineer unit with a commander senior to that of the assigned unit engineer is attached or OPCON to the parent unit (e.g., an engineer group attached to a division which has its assigned engineer battalion commander as unit engineer). The question arises as to who should be making the engineer decisions. I answer that by simply pointing out that engineer units attached or in OPCON to a unit such as a division, are under the control of the division commander and take directions from him. It may be that instructions actually come from the assigned unit engineer, but they are in the name of the higher commander. In this regard, I must call attention to the "solution" to the Military Engineer Problem cited on page 31 of the Summer 1981 ENGINEER. The method cited

there is *not* one which maximizes the effectiveness of an already sound relationship between a unit commander and his assigned unit engineer. (A more detailed discussion of that problem is on page 6 of this issue.)

The second element to be emphasized in performing the engineer mission is, put simply, the ability to do a quality engineering job. By the nature of their work, engineers normally have to be physically present at the site of action in the battle. This means the combat engineer supporting an engaged maneuver company or battalion must perform his task alongside the maneuver elements in the heat of battle. This is the primary reason we are a combat arm. This closeness to the maneuver unit and the critical necessity of immediate response is also the reason we must pay close attention to the unit commander we support—again, the rationale is as in the previous paragraph. We must plan and execute engineer functions at every level of operation. We are a combined arms team member and the success of the team, the success of our effort, must produce success in the battle.

The future. The chain-of-thought I have tried to create must be the center of our approach to the future, especially in combat engineering. It provides the basis for our equipment to be faster and more survivable in order to equal the supported force. It requires us to be more responsive to units in the M-CM-S functions. It is this thought pattern we will use at the Engineer School as we start our Mission Area Analysis on the DA functional area of "Combat Support, Engineering and Mine Warfare." We have used it in the new Engineer Combat Operations, FM 5-100, copies of which will soon be out for your coordination comments.

I recently had a splendid visit to the Canadian Forces Engineer School at Chilliwack. Their engineer symbol holds the word "Ubique" which means "Everywhere." The presence of the engineer on the battlefield, physical and otherwise, needs to be everywhere. Each of us needs to ensure that, when called, we can responsively

"Clear the Way"

Noah
Engineer

Who's Who at Fort Belvoir–

A partial list of Engineer School personnel and departments

Systems Evaluation, Capt. W.R. Sanderson, Jr.,
AV 354-2287

Organization and Force Design, Col. D. York,
AV 354-3826

Extension Training, Capt. G. Sack,
AV 354-3268

CMF 12 and MOS 12B, Capt. (P) G. Cushman,
AV 354-3632

MOS, 12C, Capt. J. Ross,
AV 354-2684

MOS 12E, 1 Lt. T. Gregg,
AV 354-2684

MOS 12F, Capt. H. Mayorga,
AV 354-2684

CMF 51, Maj. W. Peters,
AV 354-3112

CMF 81, Mr. D. Uber,
AV 354-1831

Academic Records, Mrs. J. Stone,
AV 354-2011

EOBC Training, Capt. J.W. Wessel,
AV 354-2477

Communicative Arts, Capt. D. Barthle,
AV 354-3993

Roads and Airfields, Maj. G. Cajigal,
AV 354-2527

Bridging, Maj. J.R. Van Zee,
AV 354-5981

Structures and Utilities, Capt. R. Inouye,
AV 354-3806

**USE ENGINEER HOTLINE FOR HELP WITH MOST ENGINEERING PROBLEMS,
AV 354-3646**

News & Notes

Reorganization planned

Plans for reorganizing various civil works activities due to budget and manpower cutbacks include converting the New England division to a district, Chief of Engineers Lt. Gen. Joseph K. Bratton reports.

No Corps field offices will be closed, but the reorganization includes personnel reductions at all Corps activities, streamlining districts, centralizing administrative and accounting functions, reducing services at lock structures, reducing or eliminating some recreation activities and further reducing the Corps' dredging fleet.

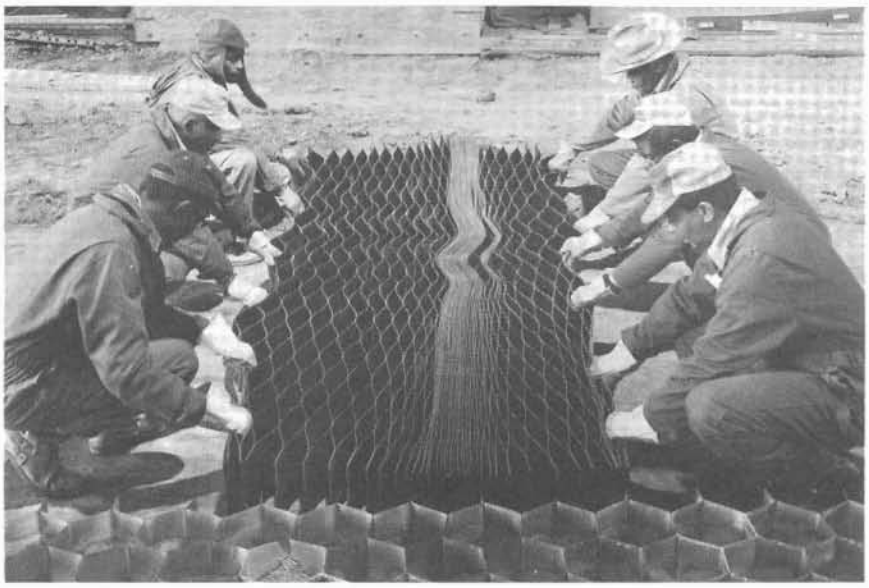
The Corps will continue its mobilization mission, keeping most engineering, construction and other technical skills available and well prepared. Engineers will also continue to provide water resource management, and to perform design and construction for the Army, Air Force and other federal agencies.

Water to Quartermasters

Engineer proponency for field water purification and distribution is being transferred to the Quartermaster Corps, with Engineers retaining responsibility for water source detection and facility support.

TOEs released in April 1981 show that division level engineer battalions and companies supporting separate brigades and regiments no longer maintain water purification sections. TOEs for units above division level are scheduled for release in 1982, with MTOEs to be implemented later by MACOMs.

Engineer concepts and doctrine favor making the adjustment as soon as mission and resources permit.



New sand-grid roadway for desert or beach

A new roadway system designed by the Army Engineer Waterways Experiment Station (WES), Vicksburg, Miss., uses a gridded, sand confinement system to solve the problem of moving heavy vehicles across the desert and beach.

Researchers discovered that a layer of aluminum grid cells filled with sand and topped by a sprayed-on coat of emulsified asphalt creates a stable roadway.

During tests, the sand-grid confinement system supported tandem-axle truck loads of 53,000 pounds for 10,000 passes with only slight rutting. In unconfined sand, the same truck made only 10 passes before becoming bogged down in 11-inch ruts.

Originally, the system was designed with honeycomb-type aluminum grids, but now thinner, lighter plastic is being evaluated. Trial sections of the sand-grids have been included in United Nations road building projects in Africa.

Army buys more detectors

A $7.3 million contract calling for retrofitting 9,500 existing mine detectors and buying 1,461 new units is part of a program to retrofit the Army's entire inventory of AN/PRS–7 mine detectors.

The man-portable unit, which worked well in the relatively moist soils of Europe and the United States, had a very low response to nonmetallic mines when tested in desert environments like the Suez Canal region. A new, more effective mine detector looks the same as the original unit but has new electronics and new battery for greater reliability in dry soils.

Knowles named Belvoir CSM

CSM Marvin L. Knowles has assumed duties as Engineer Center and Fort Belvoir command sergeant major following the retirement of CSM Frederick J. Eisenbart.

A 27-year Army veteran, Knowles came to Fort Belvoir from Aberdeen Proving Ground, Md., where he was post sergeant major.

A graduate of the Sergeants Major Academy, Knowles has also served in Korea, Vietnam and four tours in Germany. His decorations include the Meritorious Service Medal, Army Commendation Medal with three oak leaf clusters and the Humanitarian Service Medal.

Lang wins journalism award

Assistant ENGINEER editor Sp5 Nancy P. Lang has won second place in the Published Editorials division of the Army-wide 1981 Keith L. Ware competition for journalism excellence.

Lang, who served as interim-editor of ENGINEER from January to September 1981, wrote the editorials for Fort Belvoir's CASTLE newspaper. Competition winners are selected by a panel of military and civilian journalists.

652d Engineers win championship

Reservists of the 652d Engineer Company (Float Bridge), Ellsworth, Wis., captured first place in the 416th Engineer Command's third annual M4T6 tactical rafting competition for active, reserve and National Guard units.

Claiming their third straight victory in the competition, 652d engineers constructed a 55-foot long, 44-foot wide tactical raft across Squaw Lake, Fort McCoy, Wis., in 55:47 minutes—nearly 12 minutes faster than last year.

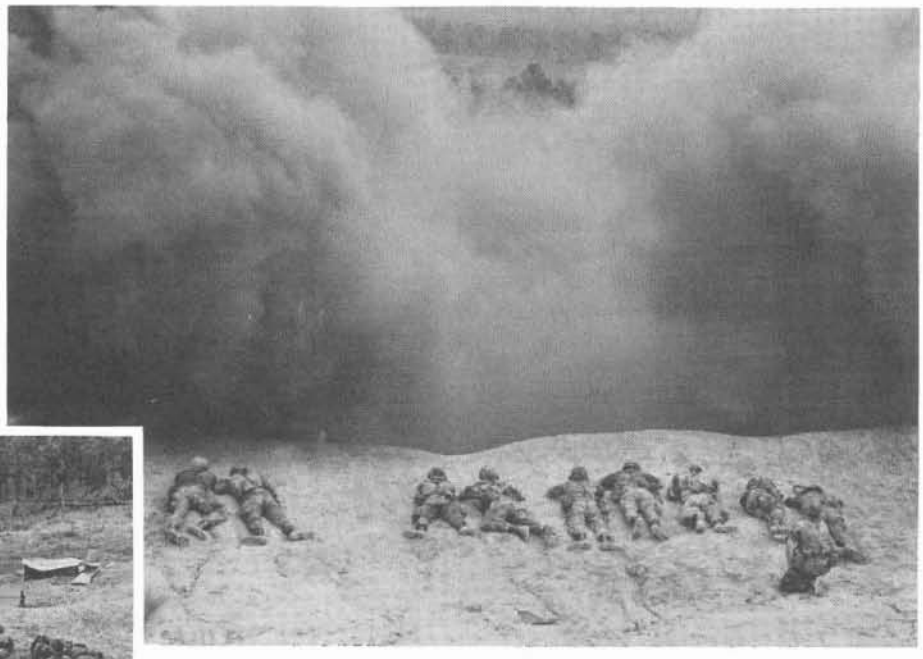
The competition emphasized construction speed, with one-minute penalty points incurred for safety errors like failure to wear gloves or life jackets, for running or for throwing tools. Penalty points were also assessed for construction errors.

Other competing units included Company A, 397th Engineer Battalion (USAR), Ladysmith, Wis., (second place); and Company A, 224th Engineer Battalion, Iowa National Guard (third place).

Plans call for the Missouri National Guard's 35th Engineer Brigade to host the competition next year at Fort Leonard Wood, Mo.

Airborne engineers 'dy-no-mite'

(photos by Marcus T. Castro)





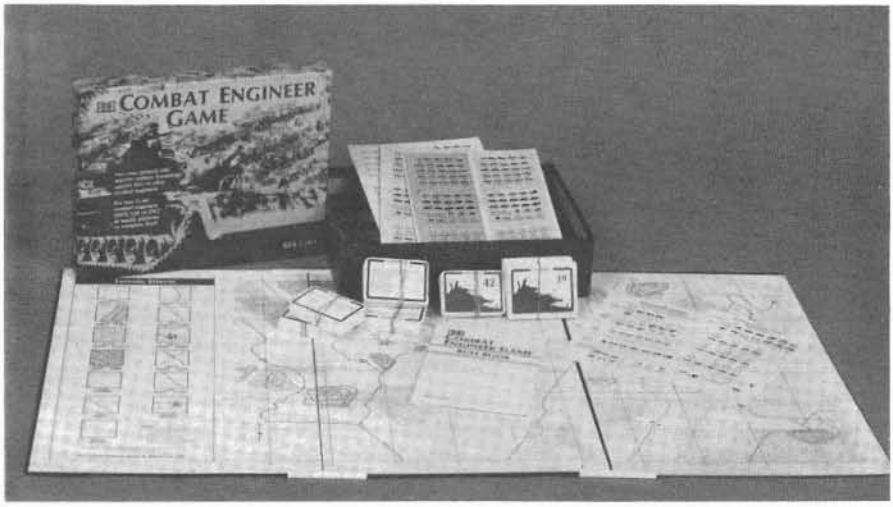
The 82d Airborne's 307th Engineer Battalion show their demolition skills at McRidge Range during Engineer Week.

News & Notes

Combat Engineer Game

The final coordination draft of the Engineer School's new "Combat Engineer Game" is being tested by nearly 900 units with the final, improved version available through local training and audiovisual support centers during fourth quarter FY 82.

The game, for two-to-six players in MOS 12B or 12C, involves organizing men and equipment, locating the proper start point using grid coordinates and choosing the best route to the assigned release point. Players then complete various missions, moving their men and equipment by correctly answering general military questions.



Engineer Problem correction

Readers noted that the solution to the Summer 1981 Military Engineer Problem was inconsistent with accepted engineer doctrine. There are, indeed, compelling reasons not to accept the published solution, and we apologize for the error. The original problem and solution is reprinted on page 7 for reference.

The first discrepancy concerns the role of the assistant division engineer. Since task organization is a function of command, the division commander makes all decisions on the allocation of forces within the division task organization. Certainly the staff will assist him, but the implication in our problem that the assistant division engineer alone decides the allocation of engineer forces is incorrect.

A second point concerns the brigade engineer who should be the commander of the normally associated engineer company. To be effective, the brigade engineer must be knowledgeable of the brigade and its operations. From the other perspective, the brigade commander needs and engineer whom he knows, can trust, and who will serve him loyally. It is very unlikely that a corps engineer unit commander can become an effective brigade engineer for an operation of short duration. Therefore, the designated brigade engineer should always come from the divisional engineer battalion. The solution for the 1st and 2nd brigade violates this principal and would hinder effective and responsive engineer support. However, when a non-divisional battalion is attached to a maneuver brigade, the battalion commander and his staff become valuable assets to the brigade commander. The brigade commander will look to this senior engineer office for advice and assistance in developing and executing the engineer plan for support. However, because of the finite association between the non-divisional battalion and the brigade, the designated brigade engineer must remain the normally associated company commander.

Summer *Engineer Problem*

The 52d Infantry Division (Mechanized) must defend a portion of the II Corps defensive sector. The G-3 has analyzed the threat and established Brigade sectors.

2d Brigade is given the narrowest sector, astride the enemy's probable main avenue of approach. A supporting attack is expected in 3d Brigade's sector. 1st Brigade's area has restrictive terrain and a major attack there is unlikely.

As the Assistant Division Engineer (ADE), you have completed an estimate of the required engineer effort. The divisional covering force requires four engineer companies, 2d Brigade requires three companies, 3d Brigade requires two companies, and 1st Brigade requires one company, as indicated below.

Since 12 companies of engineer effort are required, the division has requested and received the support of two corps combat battalions.

Acting as ADE, task/organize the divisional engineer battalion (mechanized) and the two corps combat battalions within the division area. In developing your solution you should consider:

- The Command/Support (C/S) relationship of the Engineer Corps Combat Battalions to the 52d Division.
- The C/S relationship of any engineer companies sent forward to work in the Brigade areas.
- The utilization of the mechanized divisional engineers in conjunction with the less mobile corps engineers.
- Who is to be the Brigade engineer for each brigade area and who will direct the engineer effort in the covering force area?

REQUIREMENTS

1st Brigade	2d Brigade
1 company	3 companies
Cover Force	Division Control
4 companies	52d Engr Bn
	500th Engr Cbt Bn
	502d Engr Cbt Bn

3d Brigade
2 companies

The incorrect solution

There are many possible solutions to this problem, depending on the tactical situation. In this solution, Corps engineer units are attached to the Division, and further attached to the Brigades and Covering Force. The mechanized divisional engineers are also attached out to the maneuver forces. This gives maneuver commanders the flexibility to further attach, or direct support (DS), engineers to subordinate commanders as deemed necessary. The habitual association of divisional engineer companies to maneuver elements was followed, except in the case of the 1st Brigade. A/52d was attached to the Covering Force, based on a well defined need in the CFA. It can be assumed that once the Covering Force battle is completed, A/52d will return to 1st Brigade support.

This solution also provides for a mix of the mechanized divisional engineers and the less mobile Corps engineers. It gives maneuver commanders the haul capability of Corps engineers (56 5-ton dump trucks per battalion) and the mobility and survivability of the Division's mechanized engineers. In the case of 3d Brigade, D/502d is OPCON to C/52d to ensure coordinated engineer effort in the 3d Brigade area.

The Brigade Engineer in 1st Brigade is the commander of C/500th Engineer Combat Battalion. In 2d Brigade it would be the commander of the 502d Engineer Combat Battalion, and in 3d Brigade, it would be the commander of C/52d Engineer Battalion, the habitually associated company commander. The commander of Engineer Task Force Red would be the engineer responsible for the Covering Force engineer effort. The 500th Engineer Combat Battalion provides the headquarters element for TF Red. This headquarters would probably consist of the Battalion XO and representatives from the various staff sections. The remainder of the 500th Engineer Battalion's headquarters would remain under Division control and plan for future operations.

This solution diverts from the "norm" of Corps engineer units being DS to a Division. If the Corps Engineer Combat Battalions were DS to the Division, they would have to be employed (according to FM 5-100, Engineer Operations) in a General Support (GS) role, since a unit that is in DS cannot be further subdivided. The problem with GS (and the centralized control that it entails) is that Brigade commanders are not assured of a timely response from Corps engineers in their sectors, even though they may have a recognized need for responsive engineer effort in their area.

Another problem which arises from the DS situation above is that of logistically supporting the Corps engineers as they move forward into the division area. Since these units are still under the command of their parent Corps unit, they must obtain their logistics through Corps channels. On paper, this is no problem. On the ground, however, Corps engineer units employed in the Division area often work great distances from their parent units so logistics support becomes more difficult as the distance increases.

Attaching Corps units to the Division eliminates the logistics problem since the Corps engineer units can receive support from the Division Support Command (DISCOM). The Corps Support Command, in turn, can send a slice of its assets to the DISCOM to account for the attached units.

One could argue that once the Corps engineers are attached to the Division they should be placed in DS to the Brigades (not the Covering Force), rather than attached. This option provides more centralized control of the engineer effort within the Division area and could be an acceptable alternative, depending on the tactical situation.

Building a Homemade Training Mine

by Lt. Col. Richard L. Zeltner

A shortage of training mines is one of the perennial challenges faced by engineers. There are many reasons for the shortage: lack of funds, the high cost of individual inert mines and the absence of a "hot" (currently producing) production line. Regardless of the reasons, the shortage does exist.

Here is a suggestion which won't solve all mine availability problems, but it may enable SQT or other mine training to continue when normal supplies of training mines are not available. At Figure 1 below is a common number 2½ can which is commonly used (although not in large quantities) by Army mess halls. This can possesses the exact external dimensions of a line service munition M16 antipersonnel mine.

The first step toward converting the can into a training mine is to punch a ⅝-inch hole in the remaining end (the mess steward has already removed one end). The hole is centered approximately 1¼-inch from the edge of the can, as shown in the top view in Figure 2. Since drilling the hole is difficult because of the thin metal, a punch is best used. A ⅝-inch punch is usually available at your nearest training aides supply office (TASO).

The second construction step is to obtain a ⅝-inch coarse-thread bolt with a minimum thread length of five inches and two ⅝-inch coarse-thread nuts as shown in Figure 2. Then, spray the bolt with a lubricant and insert it through the hole in the can with one nut on the inside and one nut on the outside, as illustrated in the cutaway view in Figure 3. Note that the bolt is inserted so that the threaded portion extends at least four inches into the can. This will provide space for inserting a M605 fuze when the mine is completed.

Next, invert the assembled can and fill it with a concrete mix. Once the concrete has set, the bolt and external nut can be removed. Because of the lubricant applied in step three, the bolt should be easy to remove. The internal nut will remain locked in the concrete, as shown in Figure 4. The hole left by the bolt will accommodate the M605 fuze. The nut locked in the concrete will provide the threaded base for the fuze.

Finally, paint the mine blue with a paint designed to adhere to metal surfaces. The homemade training mine will weigh a little less than the service mine, will be reasonably durable, is detectable, and best of all —is inexpensive.

Inert M605 fuzes may be obtained from two sources: they may be left over from the current training mines, or they may be recovered when live M605 fuzes are expended as part of the smoke-producing, plastic mines maintained by most TASOs. By the way, TASOs maintain four types of plastic training mines. There are two M16s (one dummy and one smoke producing) and two M21s (one dummy and one smoke producing). These are excellent training devices and their availability is increasing. But if they don't fill your training needs, you may want to produce a few homemade M16 training mines.

Lt. Col. Zeltner is chief of the U.S. Army Engineer School's Training Development Field Office at Fort Leonard Wood, Mo.



Figure 1

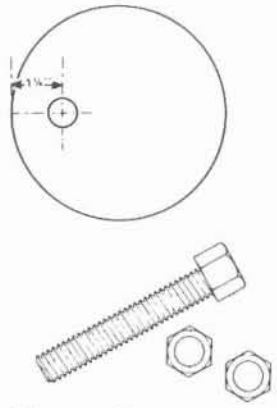


Figure 2

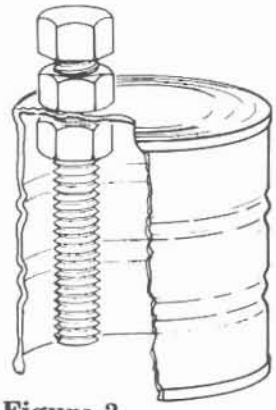


Figure 3

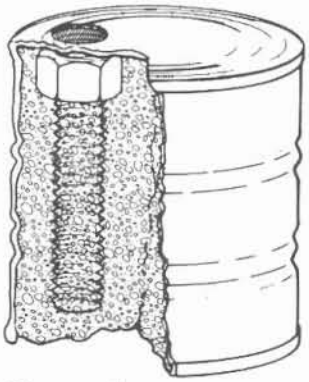
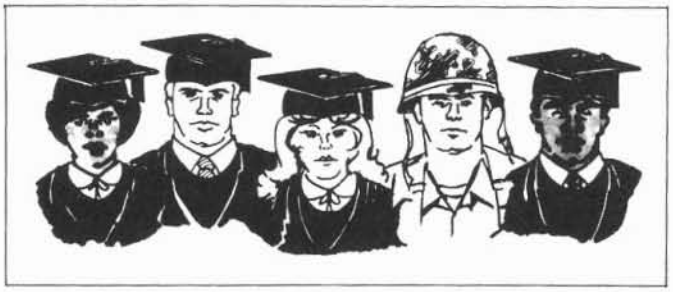


Figure 4

Illustrations by E.G. Preston

Civilian Schooling



For Army Officers

Annually, nearly 900 officers attend colleges and universities. Here are the programs that make it possible.



by Majors Wayne Sharp & Phillip Richey

Because Army training requirements cannot be met exclusively by service schools, the Army's Civil Schools (ACS) program was begun in 1946. Initially a graduate degree program only, it later was expanded to ensure that enlisted personnel have a high school education before completing their first enlistment; that warrant officers have an associate degree related to their specialty; and that commissioned officers have a baccalaureate degree.

The program also allows commissioned and warrant officers to participate in advanced degree educational programs which meet Army needs as validated by the Army Education Requirements Board (AERB).

ACS fully-funded and partially-funded programs are available with the fully-funded programs providing full-time schooling for up to two years. The Army pays all tuition and fees under the fully-funded option and allows reimbursement of up to $200 per fiscal year for textbooks and supplies. The service member also draws full pay and allowances and is authorized a permanent change of station to attend school. Fully-funded baccalaureate level programs for enlisted members were eliminated in 1976.

The partially-funded programs also authorize full pay and allowances, but the service member pays all tuition, fees and textbook expenses. These educational costs may be offset by financial aid available under the Veteran's Readjustment Benefits Act of 1966, Veteran's Educational Assistance Program (VEAP), or tuition assistance governed by AR 621–5.

Army medical (AMEDD) programs are unique and are covered under AR 351–3.

FULLY-FUNDED PROGRAMS

USMA Instructor Program provides appropriate level graduate training for officers selected as instructors at USMA. Future faculty members attend up to two years of schooling and non-teaching staff members, 18 months or less.

USMA and ROTC Top 5 Percent Program allows the top 5 percent USMA and ROTC gradu-

ates, as selected by a board, to pursue graduate civil schooling. Selected cadets may attend graduate civil schooling any time during their fourth through tenth years of commissioned service, provided their performance of duty and demonstrated potential are equal to that of other officers selected for the ACS program.



Funded Legal Education Program (FLEP) allows up to three years of law school and assignment to the Judge Advocate General Corps for officers in their second through sixth year of service. The program is governed by AR 351–22; Law School Admissions Test (LSAT) scores are required before application.

Training with Industry (TWI) allows selected officers to gain knowledge, experience and perspective in management and operational techniques in the civilian business community. Graduates fill positions of significant responsibility in Department of the Army level commands dealing with civilian industry. Training lasts one year, followed by a three-year utilization assignment.

Quotas in shortage disciplines for the programs listed above are allocated annually to the three assignment divisions of MILPERCEN, Office of the Chief of Chaplains and to the Judge Advocate General. Program participants normally study up to 18 months and must agree to serve a three-year utilization tour in a validated AERB position immediately following the schooling. Program details are in AR 621–1.

Warrant Officer Associate Degree Program is the only fully-funded undergraduate program. Up to 68 warrant officers may be schooled annually.

Fellowships, Scholarships and Grants covers all Army personnel (less AMEDD) participating in fellowships, scholarships or grants offered by tax exempt corporations, foundations, schools, etc., operating primarily for scientific, literary or educational purposes. Although not truly a fully-funded program because the Army does not pay tuition and other educational expenses, all other fully-funded rules apply, except that an AERB utilization assignment is not required. Consult AR 621–7.

Short Course Training provides tuition funds for unprogrammed training conducted by universities, federal agencies (on a reimbursable basis) and civilian organizations. Training must be less than 20 weeks, deemed necessary to perform immediate duties and approved by Headquarters, Department of the Army under the provisions of AR 621–2. Tuition is funded by MILPERCEN while travel and per diem are funded by the participant's parent organization. There is usually no active duty service obligation incurred by attendance at short courses; the one exception is for colonels that attend advanced management training under the provisions of AR 351–23.

At the graduate level, there are three partially-funded programs available—the degree completion program (DCP) and the cooperative degree program (COOP), both governed by AR 621–2; and the advanced degree program for ROTC instructor duty (ADPRID) under AR 621–101. These three programs have some general features in common:

- The discipline must be in a shortage field for which there are AERB requirements, except as indicated under COOP.
- The discipline must support one of the officer's specialties.
- A three-year utilization tour is required, except where noted.
- The primary zone of participation is from the fifth through 13th year of service.

Degree Completion Program is an opportunity to complete remaining degree requirements on a full-time basis at a civilian academic institution. DCP serves as an incentive to begin degree efforts off-duty, to be followed by full-time study under DCP later. Applicants must have scholastic aptitude and career potential. Eighteen months are authorized to complete the degree; however, most students are limited to 12 months, and many finish in six months or less.



Application must be made by letter, through channels, to the proper training agency (para 1–4G, AR 621–2) not later than 150 days prior to the start of schooling. Participation in DCP has decreased markedly in recent years (82 personnel in FY–79; 39 in FY–80). Many officers continue to get their master's degrees off-duty (in disciplines not related to one of their specialties) while this partially-funded program goes under-utilized.

Cooperative Degree Program Awards civilian academic course credit by an accredited college or university for a combination of course work done as part of a program of instruction at an Army college or school, and course work done at a civilian college or university. The program consists of three key elements:

- Academic credit is granted by a civilian college or university for portions of the Army course of instruction.
- Civilian college courses are taken in conjunction with the Army course of instruction.
- Civilian college courses are taken prior and/or subsequent to the Army course of instruction.

Cooperative degree programs are conducted at the U.S. Army Command and General Staff College, U.S. Army War College, Industrial College of the Armed Forces and at the U.S. Army Logistics Management Center. Duration of study is limited to the length of the Army course of instruction, plus six months. Participants in

COOP at other than senior staff college (SSC) level are required to study in AERB shortage disciplines. Officers attending a COOP at the U.S. Army Logistics Management Center are required to serve in an immediate AERB utilization assignments.



Selection for the COOP is predicated upon selection for the service school, and each school has its own admittance criteria. Interested officers should contact their MILPERCEN assignment division or the appropriate school coordinator for further information.

Advanced Degree Program for ROTC Instructor Duty upgrades the academic standing and provides greater assignment stability for officers assigned to ROTC instructor duty. Officers already possessing a master's degree are assigned directly to a three-year ROTC assignment. Applicants not possessing an advanced degree can be sent to school (normally the institution of ultimate assignment) for up to 15 months to complete degree requirements at the master's level. Schooling will be followed by a three-year ROTC assignment. The program of study must be in an AERB validated shortage discipline and align with one of the officer's specialties. Officers desiring to participate in this program should apply by letter to their management division. In recent years, an average of only 30 officers per year have been attending school under the provision of this program.

Permissive TDY although not a formal program, allows officers who have completed all but final resident requirements for an advanced degree full-time study for up to 139 days on a permissive TDY basis. All provisions of the DCP and the partially-funded programs generally apply.

Application procedures for all programs are explained in the applicable regulations, with AR 621–1 covering most civilian schooling programs. The Department of the Army must be notified if an individual desires to participate in a civilian education program because all programs are voluntary. Usually, a DA Form 1618–R mailed to MILPERCEN is sufficient to formalize the request. Assignment managers at MILPERCEN should also be consulted to determine selection potential for one of the programs and if selected, the best time to attend. The individual may also need to formally apply for admission to the school selected; this will be determined when talking with your assignment officer. Most universities require Graduate Record Examination (GRE) results before an individual can be accepted into a graduate school so arrangements should be made to take the exam early. The test is usually offered only four times a year.

The most frequently made mistakes when requesting graduate school are:

Qualifications

According to Engineer branch, acceptance into civil schooling programs is selective based on outstanding performance. Applicants should have the following qualifications:

- Held a successful company command
- Be an advanced course graduate
- Served overseas
- Completed two tours since commissioning

Current engineer shortage disciplines are:

Code	*Discipline*
CCX	Civil Engineering
CFX	Aeronautical Engineering
CUA	ADPS Engineering
DEX	Geodetic Science
DGK	Geological Engineering
CCP	Environmental Engineering
DED	Topographic/Photogammetry

- Study is requested in general, "soft skill" disciplines such as master's of business administration, management, education, history or political science for which there are very few Army requirements.
- Applicants for civilian education programs fail to plan ahead. Arrangements must be made well in advance to take the GRE and to apply for admission at several schools.
- Many applicants have an insufficient background in mathematics to study in the technical fields that make up the majority of areas on the shortage discipline list. Applicants should insure proficiency in mathematics through calculus and statistics.

Annually, the Department of the Army budgets more than $3 million to educate warrant and commissioned officers at the associate, undergraduate and master's level. This amount covers approximately 440 officers in fully-funded programs and more than 400 officers in partially-funded programs.

For more information write: HQDA MILPERCEN, ATTN: DAPC–OPP–E, 200 Stovall Street, Alexandria, VA 22332 or call AUTOVON 221-0685/8100 or commercial (202) 325-0685/8100.

Maj. Sharp, a MILPERCEN military education officer, graduated from a Kansas State University and holds a master's degree from Northwest Missouri State University. He has served in artillery units and as Assistant PMS at Missouri Western State College. Maj. Richey, a MILPERCEN program resource officer, graduated from Oregon State University and has a Master's degree from Georgia State University. He has served as Assistant PMS at University of Oregon and as a rifle platoon leader in Vietnam.

Illustration by Judi Milling.

A better mousetrap

The 20th Engineer's "Mission Card" reduces class preparation time, improves training quality

by Lt. Col. L.G. Ailinger
and Capt. Donald Whitten

The Battalion Training Management System (BTMS) is now the standard training system throughout the Army. By definition under BTMS, the squad leader is the primary trainer, and this indeed is proper. All echelons above the trainer have the primary task of providing him the resources to accomplish this training mission, and of these, time is probably his most acutely needed resource. For the trainer to do his job properly under BTMS, while still paying proper attention to his leadership responsibilities, is truly a challenging, full-time endeavor. Can we provide him more time? Perhaps not, but the 20th Engineer Battalion at Fort Campbell, Ky., has devised a way to minimize the squad leader's time requirements while serving in his role as *the* trainer. The vehicle we employed to construct this better mousetrap is the "mission card."

Our 5-by-8 inch mission card was designed to minimize the inordinate amount of research required to properly prepare a class on any of our ARTEP tasks. Each ARTEP task was addressed at every applicable echelon. An example, shown in Figure 1, describes ARTEP task 6–18, *Construct Barbed Wire Entanglements,* which is a squad level task. (As an aside, our card was adapted as an offi-

MISSION LIST

MISSION: CONSTRUCT BARBED WIRE ENTANGLEMENTS LEVEL	BN	CO	PTL	SQD
ARTEP TASK: 6-18				X

RELATED ARTEP TASK: 6-21

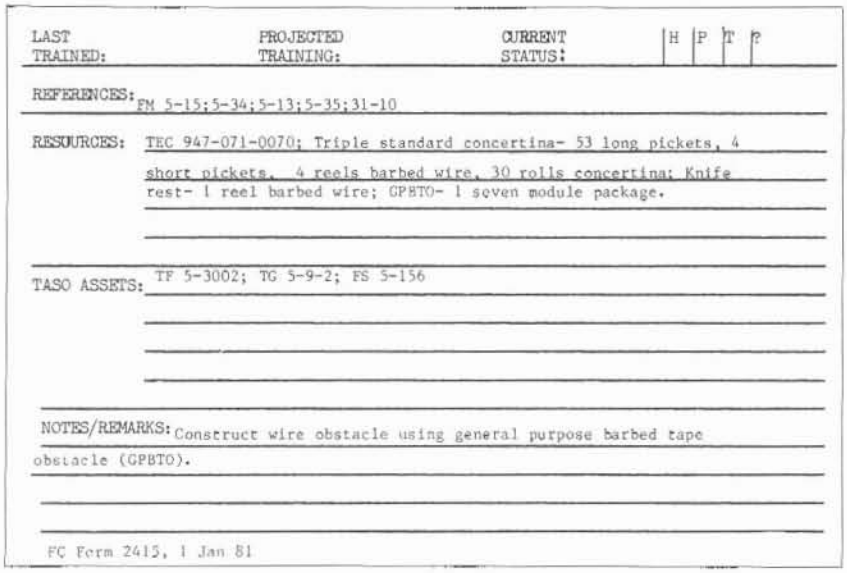
PRINCIPAL SM TASK: 051-195-3003

CONDITIONS: Required materials available on site. Security provided. Gauntlets available.

SUBTASKS	RELATED SM TASKS
1 Const. triple standard concertina	051-195-3003/1001/1002
2 Construct knife rest	051-195-3003/1001
3 Construct wire obstacle (see note)	051-195-3003/1002
4	
5	
6	
7	

FC Form 2415, 1 Jan 81

The mission card provides a complete listing of ARTEP tasks and sub-tasks. (Figure 1.)



LAST TRAINED: | PROJECTED TRAINING: | CURRENT STATUS: | H | P | T | P

REFERENCES: FM 5-15;5-34;5-13;5-35;31-10

RESOURCES: TEC 947-071-0070; Triple standard concertina- 53 long pickets, 4 short pickets, 4 reels barbed wire, 30 rolls concertina; Knife rest- 1 reel barbed wire; GPBTO- 1 seven module package.

TASO ASSETS: TF 5-3002; TG 5-9-2; FS 5-156

NOTES/REMARKS: Construct wire obstacle using general purpose barbed tape obstacle (GPBTO).

FC Form 2415, 1 Jan 81

As a handy guide listing references and training assets, mission cards significantly reduce class preparation time for unit instructors. (Figure 2.)

cial Fort Campbell form and is now available to any unit, not just engineers.)

The front of the card lists not only the ARTEP task number, title and conditions, but also shows related ARTEP tasks, the principle leadership Soldier's Manual (SM) task(s), and all sub-tasks, either specified in the ARTEP itself or implied. Most importantly perhaps, it also lists all the related SM tasks where individual proficiency will be required to satisfactorily complete the collective task. Knowing these required tasks, the squad leader can begin preparing his soldiers well ahead of the required ARTEP task class, using his job books to determine individual proficiency and opportunity training time as needed.

The reverse of the mission card lists his squad's status on the ARTEP task so he'll know exactly the depth of instruction required. It also lists all necessary references, resources including applicable training extension course tapes in the battalion learning resource center, and assets available at the post training and audiovisual support center, including all pertinent training films, training devices, instructional packets, etc. The *Notes/Remarks* section perhaps would have been better titled "Training Tips" since each trainer notes here any items of particular interest, such as a refinement, knack or clever nuance he has discovered. This information is then shared at periodic company/battalion meetings.

Basically, the mission card contains, in one place, all the necessary information required to prepare a class on any ARTEP task. It has done the trainer's homework, for the most part, allowing the trainer to devote his scarce time to *preparing* the class, not *researching* it. The improvement in both class presentations and in task proficiency is significant!

Each trainer has a set of mission cards for all tasks at his level, and for each echelon below his level. Thus a platoon leader/sergeant has the 67 cards for his platoon tasks and also a complete set of the 41 squad cards (as does each squad leader). Ultimately, there is one 258-card deck at battalion concerning all tasks at the battalion, company, platoon and squad levels.

The initial compilation of the complete deck was a staggering task, but its impact was reduced by equitably distributing card preparation tasks to all levels throughout the battalion. Thus, any given squad leader was responsible for preparing only two or three cards. The draft cards were reviewed at all echelons before final approval and publication. Word processing equipment, while not essential, has been an extremely valuable aid in quickly and simply refining existing cards.

A complete set of ARTEP 5–35 mission cards will be forwarded to the Engineer School for their possible use since substantial numbers of the tasks covered are common to all engineer ARTEP's. Once a set of mission cards is completed, the user's task is simply to continually refine and improve the cards. The 20th Engineer Battalion is extremely pleased with the mission card concept and how it has increased the efficiency of trainers at all levels and improved the professionalism of battalion training. Try using mission cards, we think you'll like them, too!

Lt. Col. Ailinger, as commander of the 20th Engineer Battalion (Combat), Fort Campbell, Ky., designed the mission card system, instituting it with the help of Capt. Whitten, the battalion operations officer. Ailinger, commander of the 173rd Engineer Company (Airborne) in Vietnam, currently is executive officer of the physics department at the U.S. Military Academy. Whitten, a Virginia Military Institute graduate, still serves as the 20th's S–3.

TERRORISM

The philosophy. The strategy.

Terrorism is like love. It's hard to define, but you know it when you see it.

Terrorism is a tool used by many widely varying types of organizations throughout the world. For these organizations, terrorism is a rational, cohesive strategy for the achievement of personal and political ends. While unbalanced individuals may be attracted to and exploited by terrorist groups, their individual abberations should not be seen as indicative of the nature of the sponsoring organization. The acts of terrorist groups are seldom either irrational or random. Instead they are purposeful and rational, forming patterns which may be identified and analyzed.

Attributes of Terrorism

Alexander George and Richard Smoke have proposed that rationality is really five separate attributes: 1) an internally consistent value system; 2) an ability to assess the outcome of an action, that is, the ability to anticipate consequences; 3) an ability to relate a specific act to an expected outcome; 4) an ability to understand an opponent's value system without necessarily sharing it; and finally, 5) the possession of sufficient information to accomplish items 2, 3 and 4, above. The rational actor must have a consistent value system, the ability to choose actions which are likely to achieve his goals and an understanding of the effect such actions will have on an adversary.[1]

by Capt. Tom Adams

First of all, it is easily shown that terrorists responsible for some supposedly "pointless" atrocity have a definite objective in mind which is vital to them. The senseless violence of the terrorist is, in fact, aimed at achieving some valued goal such as the liberation of one's homeland (the Irish Republican Army [IRA] or South West African People's Organization [SWAPO]) or the smashing of international imperialism (the United Red Army).

Tactical Goals

Most theorists agree on five general tactical goals of terrorist groups: 1) publicity for their cause; 2) harassment of the authorities; 3) polarization of society; 4) aggravation of state-to-state relations; and finally, 5) the achievement of operational objectives (money, the release of imprisoned leaders, and so forth). Operational objectives are usually secondary objectives. The primary purpose of kidnapping or assassination is most likely to be found among the first four goals. The memoirs, statements and interviews of terrorist leaders and theorists show that they are usually able to evaluate outcomes and objectives in a rational manner.[2]

The ability to relate a specific action to an expected outcome has been assessed by Ernest Evens. Evens suggests that terrorists weigh various possible courses and adopt the most productive ones. He illustrates this point by examining the recent history of political kidnappings and proving that the incidence of such kidnappings increased dramatically after they were shown to be a profitable and effective tactic in 1969. Furthermore, as terrorists discovered the utility of kidnapping diplomats, specifically US diplomats, the number of incidents involving American officials rose.[3]

The fourth attribute, the ability to understand an opponent's value system, is less obviously met and represents an important weakness in terrorist operations. Some groups, the Cypriot terrorists for example, have shown a shrewd grasp of their adversary's value system and an ability to manipulate it. Other groups show less of this ability. The Palestinians who hijacked an Israeli airliner to Entebbe revealed little understanding of the Israeli perspective, especially Israel's willingness to put hostage passengers at risk. Similarly, the inability of powerful elements in Iran's Revolutionary Council to understand American values probably prolonged the US hostage crisis.

The fifth point, the need for information, is invariably met by floods of information provided by the media and various governments. This gives terrorist groups ample feedback and useful intelligence for planning further moves.

Terrorism's Common Ideology

While terrorist groups may be rational, there seems to be an almost infinite variation in methods, goals and rationales among them. Fortunately they

share some basic characteristics. Among leftist revolutionary groups (the bulk of terror groups) there is an essential ideology which seems to transcend nationality and circumstances. All groups or movements loosely characterized as leftist revolutionary are opposed to what they term "exploitation." In practice they equate exploitation with capitalism, and capitalism in turn with fascism, regardless of any democratic process(es) involved.[4] In the words of Sekigunha, the self-proclaimed "warrior" society behind the United Red Army of Japan, "What we will never accept is the fact, brought about by capitalism, of people exploiting other people. And this is our motive for being willing to fight and being prepared to use all means possible to fight."[5]

By exploitation, leftist terror groups seem to mean the use of anyone's person, talents, abilities, property or resources for any purpose with which that individual does not fully and freely agree. The fact that terrorism is itself an extraordinarily cruel form of exploitation does not disturb its advocates and apologists.

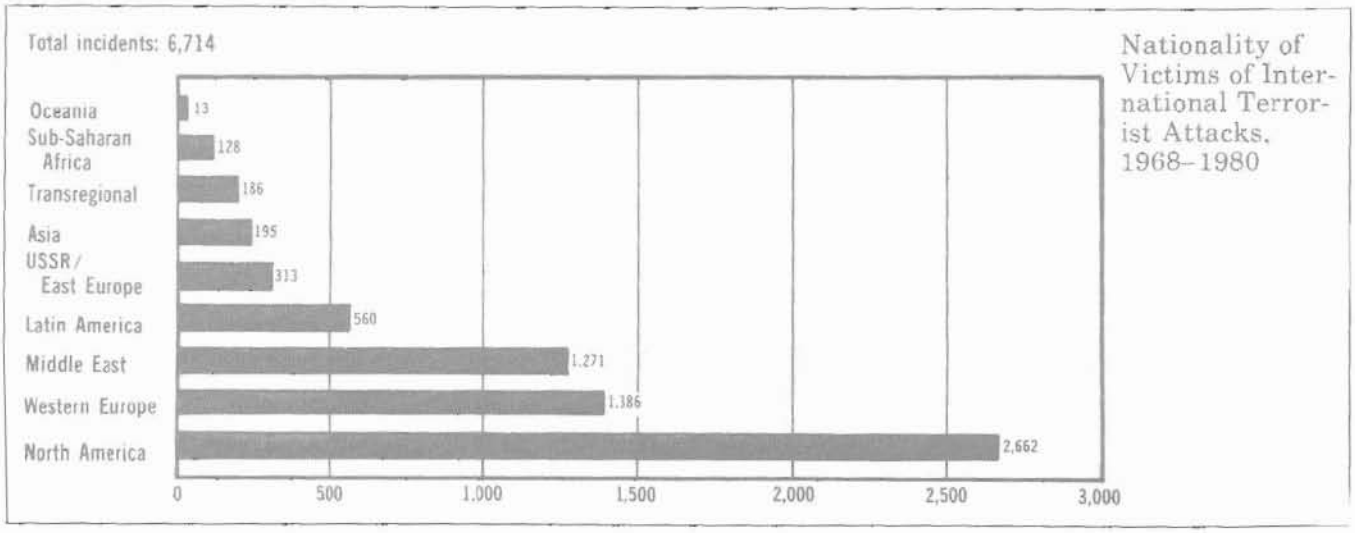
This leads to the next common ideological principle, the idea that "no one is innocent," and there are no innocent victims of terrorism. This principle is divided into several subarguments but all lead to the same conclusion: the taking of lives is morally justified. Briefly put, terrorists hold every member of a society responsible for the wrongs perpetrated by that society, even if only by inaction. Terrorists (and their supporters) alone are "innocent" because they alone are actively opposed to the "wrongs" of society. The Tupamaros of Uruguay hold that, "there are no innocent bystanders."[6] There are two popular variations of this argument. First, terrorists claim they are acting on behalf of an oppressed, greatly suffering people and that any act calculated to end that suffering is justifiable. Second, they argue that the adversary government, by its oppressive behavior, forces them to act and is therefore to blame.

The last important philosophical common ground is the notion that violence is worthwhile, whether or not it achieves any tangible goal. In its most eloquent form this idea was expressed by psychiatrist Frantz Fanon, a supporter of the Front Liberation Nationale (FLN) in Algeria. Fanon's book, **The Wretched of the Earth,** achieved great popularity among terror apologists, influencing groups as diverse as the Front de Liberation du Quebec (FLQ) in Canada and the Frente Nacional de Liberataco de Angola (FNLA).[7] Fanon became a major spokesman for terrorism when he wrote that violence has a cleansing effect on individuals (the perpetrators, not the victims), freeing the oppressed from feelings of inferiority and making them fearless. Fanon further argued that the mere fact of violence raises national consciousness, forcing people to take sides by making them conscious of their common cause against the oppressor.[8] The notion that violence need not have a concrete goal to be effective is especially important because it answers the charge that terrorist acts are unproductive.

Although terrorists possess something in the way of a common ideology, they have a common strategy only in the most general sense because terror organizations represent an entire spectrum of behavior ranging from criminal/psychopathic to national "patriots" or "liberators." For our purposes the most significant strategy of the terrorist stems from a particular notion of the relationship of a government to its people.

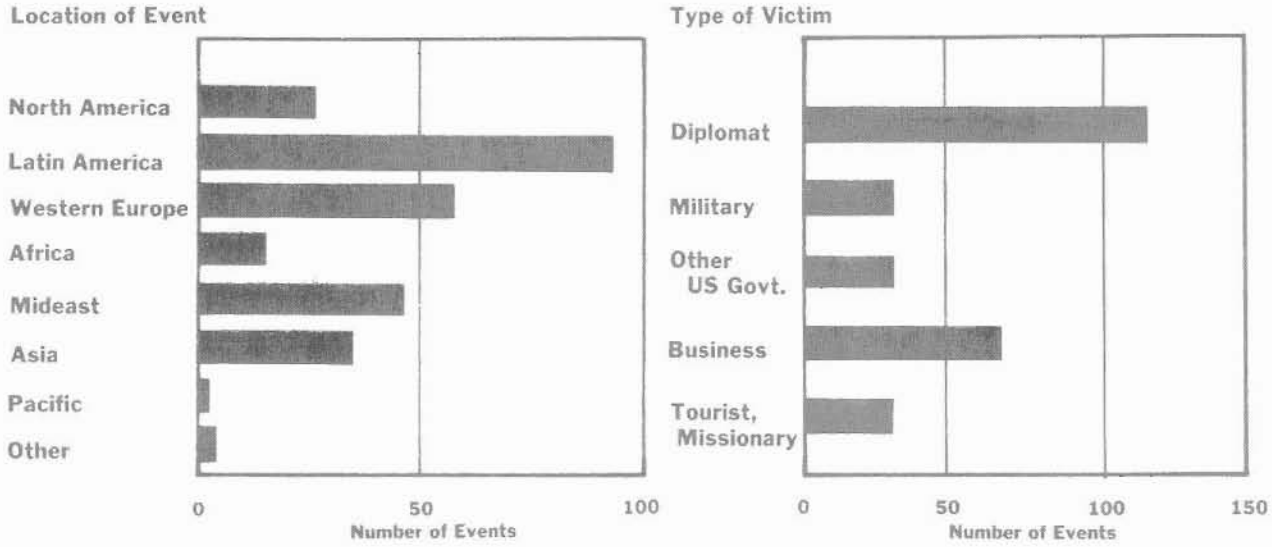
Government

In its most primitve form a government is organized to protect those who subscribe to it, and to assist them in gaining basic needs. It protects and assists its people by means of security forces (police and military) and social welfare programs. Citizens are allowed whatever freedom they possess because the government pro-



Nationality of Victims of International Terrorist Attacks, 1968–1980

International Terrorist Attacks on US Personnel and Facilities, 1980



tects them as a group and does not need to protect them as individuals.

The political terrorist, unlike the criminal, attacks this implied contract between a government and its citizens. Criminal terror is usually incidental to the commission of a crime and seldom disruptive of the social system. The use of criminal methods by terrorists can, however, have significant effect by alarming an entire populace and casting doubt on a government's ability to protect its people. This can be accomplished through the application of seemingly random violence, requiring very little equipment and few people. Since innocent lives are taken or jeopardized, *everyone* has cause to fear such attacks. And even the harshest and most repressive government cannot protect everyone all of the time.

To fulfill its most basic obligation to protect its citizens, a government beset by terrorists must resort to harsh methods—roadblocks, stop and search laws, arrest without warrant and detention without trial, suppressing basic liberties even as these measures disrupt the economy and inhibit the government's social welfare function. While the government may succeed in repressing terrorism, the ordinary citizens most adversely affected by its antiterrorist programs may begin to see it, and not the terrorists, as the source of their problems.

In actual practice, of course, all this does not work out so neatly. West Germany's Baader-Meinhof Gang and Canada's FLQ succeeded in provoking repressive measures without generating significant support for their movements. Uruguay's Tuparmaro urban guerrillas provoked harsh but effective governmental measures which actually succeeded in wiping out the Tupamaros.

In the end, few terrorist groups expected to topple an adversary government through their personal efforts. Instead, they hope to stimulate general opposition to the government, creating genuine popular uprisings which they themselves would lead.[9] The Front de Liberation Nationale achieved this in Algeria while the IRA Provisionals in Ulster succeeded in shifting much sectarian hostility onto the British.

Categorizing Terrorists

In separating revolutionary terrorists from other varieties, it is critically important to understand that there are no ironclad categories. Some terrorist groups are very difficult to pin down. The most important variable among them is the degree of political orientation. Conflict theorist J. Bowyer Bell separates terror users into four broad categories: criminals, psychopaths, vigilantes and revolutionaries.[10] The intelligence analyst must be able to differentiate one from another because all may use the fashionable rhetoric of revolution and "national liberation."

Although American theorists rightfully tend to regard all terrorists as criminals, such thinking is not very helpful. Criminals are deterred by arrest and denial of an opportunity to profit monetarily while politically-motivated terrorists are not deterred by the same means. The immediate, material gains of terrorist acts (such as ransom) are secondary to the desired political gains. Terrorists are not averse to the publicity of a trial, and unlike most criminals, they are not unwilling to be martyred for their causes.[11]

The psychopathic or cult terrorists who use revolutionary jargon are more confusing. The notorious Atlanta murders of 1980–81 have some characteristics of terrorist violence and have certainly spread fear among the population while lacking any apparent political context. These are apparently psychopathic acts of terror. Less obviously psychopathic are cults such as the Manson "family" (with its vague pronouncements of race war) and the surrealistic

Symbionese Liberation Army. Unfortunately, too many observers accept these groups' self-proclaimed revolutionary status. Combining the worst aspects of cult and criminal conspiracy, these groups utilize revolutionary rhetoric to rationlize their self-destructive impulses, "violence as therapy," Bell terms it.[12] They might be characterized as violent eccentrics but, lacking purpose, program or constituency, they are not revolutionary.

Vigilante groups, right-wing terrorists fighting real or perceived threats to the established order, are at once more dangerous and difficult. Some, such as the Ku Klux Klan, find their targets among various racial or ethnic segments of the population. Others, such as the Fighting Union of El Salvador or the Ojo por Ojo (Eye for an Eye) in Guatemala, oppose leftist threats to existing government. The Ulster Defense Association, for example, sees itself as a defender against the terrorist threat of the Provisional IRA.[13] Right-wing groups often draw on local security forces for membership and support since such forces, by definition, support the status quo. Occasionally, they operate with the tacit consent or outright approval of the regime in power. Rarely, as in the case of Haiti's Ton Ton Macoo, vigilante groups are actually established by the local rulers and function as a travesty of a civil police force.[14]

The last type of terrorist group we will consider is the revolutionary movement with genuine political goals. Such groups are sometimes seen as real terrorists. They should not be confused with guerrilla or insurgent movements having real constituencies and significant community support. Guerrillas are recognized under international law and are, at least in theory, subject to the rules of war.[15]

Revolutionary terrorism may be visualized as a step preceding guerrilla warfare. It is the weapon of groups too weak to challenge the authorities through irregular warfare. Terrorism allows such groups a means of creating a situation which will help their cause to succeed. Should they become full-fledged popular revolutionary movements, a concern for their reputation as liberators may well result in limited terrorist acts although terrorism will be used against members in order to maintain internal discipline. Counter-terrorists should therefore realize that a terrorist group is most in a dangerous state after the would-be movement gains some support and until it has gained enough support to allow it to abandon terrorism. During this period, the group's capabilities and resources are steadily improving, making it potentially lethally effective. Many revolutionary movements remain in this interim state for years although the FLN is one group which succeeded in making the transition from terrorist faction to revolutionary movement. The IRA has not managed the transition to popular revolutionary movement.

Conclusion

While the logic of terrorism is indeed alien to most observers, the study of terrorism is important. Terrorism has become a permanent force in the modern world and as such, it deserves our special attention and close scrutiny.

Footnotes

1. Alexander George and Richard Smoke, **Deterrence in American Foreign Policy: Theory and Practice** (New York: Columbia University Press, 1974), p. 48.

2. Ernest Evens, **Calling a Truce to Terror** (London: Greenwood Press, 1979), p. 73. See also: George Grivas, **Memoirs of General Grivas** (New York: Preager Press, 1965), p. 204; and Leila Khaled, **My People Shall Live** (London: Hodden & Staughton, 1973), p. 214.

3. Evens, *op cit,* p. 74.

4. Jan Schriber, **The Ultimate Weapon** (New York: William Morrow & Co., 1978), p. 199.

Ibid., p. 200.

6. *Terrorism,* **Skeptic** (January–February 1976), p. 37. See also: Christopher Dobson, **Black September** (New York: Macmillan Publishing, 1974), p. 31.

7. Gustave Morf, **Terror in Quebec** (Toronto: Clarke, Irwin & Co., 1970), p. 35.

8. Frantz Fanon, **The Wretched of the Earth** (New York: Grove Press, 1963), pp. 73–74.

9. See Regis Debray, **Revolution in the Revolution?** (New York: Grove Press, 1967).

10. J. Bowyer Bell, **A Time of Terror** (New York: Basic Books, 1978), pp. 36–57.

11. Rand Corp. study as cited by Paul Wilkinson, **Terrorism and the Liberal State** (MacMillan, London, 1977), p. 194.

12. Bell, *op cit.,* p. 43.

13. *Ulster, the Counter-Terror,* **Sunday World** (Dublin), 9 June 1973.

14. See also: Amnesty International, **Report on Torture** (New York: Farrar, Strauss & Giroux, 1973, 1975).

15. Tom Adams, *Terrorism and International Law,* **TVI Journal** (October 1980), pp. 3, 6.

Reprinted from Military Intelligence magazine. Graphs from Defense & Economy World Survey.

Book Review

The Terror Network

The Terror Network, by Claire Sterling, Holt, Rinehart and Winston and Readers Digest Press, New York, N.Y.

Reviewed by Rudolf Levy

Claire Sterling's recent book on the "international terrorist connection," is a well presented, in-depth study of contemporary international terrorism. Many of the episodes discussed in the book have been considered since the early 1960s. **The Terror Network** appropriately emphasizes the well-organized and well-financed nature of the international terrorist machinery which has even spread into traditionally neutral and peaceful countries such as Switzerland and Austria.

The Terror Network shows in indisputable terms the origin of most of the terrorists' arms and financial support. Sterling's rather humorous description of Libya's Muammar Quaddafi as the "Daddy Warbucks," could not be disputed by Quaddafi's staunchest supporters or by other terror supporters such as Cuba, the Soviet Union and its satellites, North Korea, Vietnam and a few others.

Author Sterling skillfully explains and documents the expert Soviet manipulation of Cuban and Palestinian causes into "magnetic poles I and II," and the subversion of many legitimate liberation movements into communist revolutionary terrorist operations. Soviet and Cuban leadership in international terrorism has far greater implications than ever imagined.

Sterling's discussion of the support of the international terrorist network during the "Fright Decade" of the 1970s suggests that terrorism will be even more pervasive in the 1980s. One of the best examples of international terrorist cooperation unfolded in the 1970 massacre at Israel's Lod Airport, perpetrated by members of the Japanese Red Army who had been trained in Lebanon and elsewhere in the Middle East, provided with false documents by West German terrorists and armed with Czechoslovakian weapons delivered in Rome by a Venezuelan Communist. In the Lod Airport massacre, the Japanese terrorists calmly machine-gunned a crowd primarily composed of Puerto Rican pilgrims to the Holy Land.

Ms. Sterling's portrayal of Ilich Ramirez Sanches, also known as Carlos the Jackal, is a factual documentation of a dedicated, cold-blooded terrorist trained by the Cuban DGI at Camp Matanzas under the tutelage of the notorious KGB terrorist operator Colonel Viktor Semenov. Carlos' further terrorist education, on recommendation of the Communist Party of his native Venezuela, included a stint at Patrice Lumumba University in Moscow, the "graduate school of terrorism." After further training in the Middle East, Carlos worked for or on behalf of the Palestinian "struggle," specializing in assassinations and kidnappings, the organization of terrorist cells throughout Europe and the smuggling of weapons. Carlos' grenade attack on a crowd at Le Drug Store in Paris, which killed several people and injured 26, was planned to put pressure on the French government on behalf of the Japanese Red Army terrorists then holding the French Embassy in Holland in order to free comrades then held in French jails. (Incidentally, the grenades used in the attack on Le Drug Store were US M-26 grenades stolen by the Baader-Meinhof Gang from the US Army Ammunition Depot at Miesau, Germany. The grenades stolen from the depot were used in four other terrorist attacks during the 1970s.) Carlos masterminded the kidnapping of OPEC oil ministers gathered in Vienna, Austria with the help of the Baader-Meinhof Gang. Carlos also smuggled Soviet-made SAM-7 missiles into Italy, where only a tip from Israeli intelligence to Italian authorities prevented the Palestinian terrorists from shooting down an Israeli airliner taking off from Rome Airport.

The Terror Network's accurate and pertinent data on such international terrorist organizations as the Junta for Revolutionary Coordination gives insight into the remarkable progress of international terrorism. Formed in Latin America by Argentinian, Chilean, Paraguayan and Uruguayan terrorists, the JRC was expanded and taken over by the Cuban DGI. Initial funds were given by the Argentine's Montoneros from ransoms received from the United States and other nations for the release of company executives.

After Cuban and Soviet involvement with the JRC, other headquarters and coordination offices were opened in Paris, Lisbon and Brussels. The JRC presently includes Basque terrorists, Irish Republican Army Provisionals, West Germany's Red Army Faction, the Direct Action movements and the Raul Sendic Brigade of France, Palestinians, Red Brigades of Italy and several Latin American terrorist groups. The JRC is still growing, a Trotskyite dream of globalized terrorism and revolution come true.

More frightening than terrorism itself is the unwillingness of many nations (including, until recently, the United States), to recognize the global nature of terrorism or its irrefutable support by such nations as the Soviet Union and Cuba. A second problem is the accommodationist attitudes of countries which would rather not get involved with terrorists for fear of terrorist retribution. Some of these mistakes are now being rectified as many nations are discovering that no matter how tightly they shut their eyes, terrorism will not go away. Some strong measures have been taken to control international terrorism and minimize the effects of terrorism on the international community, but terrorism is now well-entrenched. It is hoped that it is not too late.

The Terror Network is an excellent study of terrorism, and, without a doubt, must reading for all military professionals.

Reprinted from Military Intelligence magazine. Rudolf Levy, an author, lecturer and respected authority on terrorism, is a staff member of the Army Intelligence Center and School, Fort Huachuca, Ariz.

ECTC 81

Led by 20 general officers, more than 600 engineers from 196 active and reserve component units converged at Crystal City, Va., December 5–6 for the 1981 Engineer Commanders' Training Conference (ECTC). The meeting was hosted by Engineer School Commandant Maj. Gen. Max W. Noah. Major discussion topics were engineer operations in the airland battle and training initiatives in units worldwide.

Lt. Gen. William J. Livsey Jr., commander, VII Corps, U.S. Army Europe (USAREUR), presented a dynamic keynote address on engineer support requirements as viewed by a major maneuver force commander. Corps of Engineers support to the Total Army was covered by Chief of Engineers Lt. Gen. Joseph K. Bratton.

Livsey discussed the challenge of engineer support at corps level and stressed the need for frequent training under conditions duplicating as closely as possible the milieu of the battlefield. The former 8th Infantry Division commander praised U.S. soldiers saying, "I have no qualms about the quality of our young American soldiers. They are, in fact, magnificient. All they need is outstanding leadership, care, compassion and love." His assessment of USAREUR was "we're better than we've ever been."

Another highlight was 2d Engineer Battalion (2d Infantry Division) commander Lt. Col. C.H. "Stretch" Dunn Jr.'s presentation of the battalion's live-fire training in overcoming a complex obstacle. Dunn, aided by slides and a video tape, detailed how the battalion prepared for the exercise by constructing a simulated North Korean mine field supplemented by two anti-tank ditches. The battalion then conducted a successful assault breach of the obstacle, supported by tanks, artillery, armed helicopters, intelligence and air defense assets. (An article by Dunn regarding engineer officer career management appears in this issue of ENGINEER on page 28.)

Other topics covered in the two-day conference included a discussion of the operational doctrine in the recently published FM 5-100 *Engineer Combat Operations,* Army 86 studies, airfield damage repair and the Systems Program Review action plan.

The innovative Engineer Battalion Training Management Program developed by the 579th Engineers, California Army National Guard, and engineer participation in Operation Bright Star were discussed and will be covered in detail in future issues of ENGINEER.

Conference coordinator Lt. Col. George Temple reports the 1982 ECTC will be held in early December in the Washington, D.C., area.



ECTC 81 keynote speaker Lt. Gen. William J. Livsey Jr. stressed the importance of frequent, realistic training.

Effective Performance Counseling

by Chaplain (Maj.) Wayne O. Smith

Counseling plays a significant role in the functioning and effectiveness of military units, regardless of size or mission. Leaders who see counseling as a positive tool and who use it as such will also see positive results in overall performance of duties. Many units throughout the Army are practicing good counseling and have ongoing training in how to counsel.

An aid to effective counseling can be the counseling statement or record of counseling. If it is used properly, this document can be very helpful, especially in performance counseling.

It can provide a summary of what was said, a record of what was said, and as a last resort, evidence of what was said. The use of the word "can" here is intentional. There is an apparent trend toward the misuse and even abuse of the counseling statement.

Although it was never intended to be a substitute for counseling, the counseling statement has become just that for many people in supervisory positions. Admittedly, having a pre-printed form and simply filling in the blanks instead of holding a formal counseling session, saves some time (initially), but how does it improve performance? How does it develop respectful, healthy relationships between the counselor and the counselee? The answer, of course, is that it does not. Too often the question, "Have you counseled this soldier?" gets the response, "Yes, I have several counseling statements on him." But has the soldier really been counseled?

The format of the counseling statement is also important. If the format is negative, demeaning or accusatory, it will likely sabotage any possibility of good counseling. It will produce, if anything, merely grudging compliance. The counseling statement that requires the reading of a soldier's rights under Article 31 of the UCMJ precludes any positive feedback, and is a far cry from what performance counseling is all about.

There are many reasons for the abuse and misuse of the counseling statement; two of them will be addressed here. The first has to do with the inability, real or perceived, to do effective counseling. Good performance counseling involves training, work and risk-taking. Thus, it is easier to have someone devise a form which can be used in lieu of real counseling. The result, however, is often that the negative performance is highlighted and the positive performance goes unrewarded, if not altogether unnoticed. One of the responsibilities of military leaders is to develop counseling skills early.

A second reason counseling statements are misused is a reflection of the leader/supervisor's overall outlook towards subordinates. If that outlook is what Douglas McGregor (1957)[1] terms "Theory X," the subordinate is viewed as basically lazy, unmotivated, with no ambition, no sense of responsibility. Additionally, the subordinate is perceived as motivated only through threats of punishment and must be coerced and controlled in order to ensure performance. With this orientation, supervisors often fail to see the danger in devising a counseling statement that is totally negative and used primarily to "nail" people.

Although the Theory X approach does achieve some objectives, it is not the most efficient

[1] Douglas McGregor, **The Human Side of Enterprise** (McGraw-Hill, 1957).

PERSONAL IN NATURE when completed

Counseling Record

Privacy Act Statement on Reverse

SECTION I—Individual Data

DATE _____

NAME | GRADE | SSAN | Class/Duty Section/Company

SECTION II—Circumstances

SECTION III—Counselors Comments

Couselors Signature

SECTION IV—Individual Acknowledgement

I have seen a copy of the record, and have been counselled concerning the report.

DATE | PRINTED NAME | SIGNATURE

FB FM 35. 18 Apr 78 (Rev) PERSONAL IN NATURE when completed

A good counseling statement format is essential to effective counseling.

means of getting the job done and should not be encouraged. This is an important consideration in view of the Army's "up-or-out" system because the supervisor should be grooming subordinates to move into supervisory jobs. Some soldiers fit the Theory X description, but the majority do not. Thus effective performance counseling must involve more than threats of punishment and devising ways to "nail the guy."

It follows then, that good performance counseling should allow for positive critique and growth. The counseling statement should be used to reflect both positive and negative aspects of the session. A clear record of what was said puts the responsibility on the counselor to do good counseling. Effective performance counseling should at least be:

1. Specific
   a. What are the unit's standards?
   b. What are your expectations of the counselee?
2. Measurable
   a. What do you want the soldier to do?
   b. How well?
   c. By when?

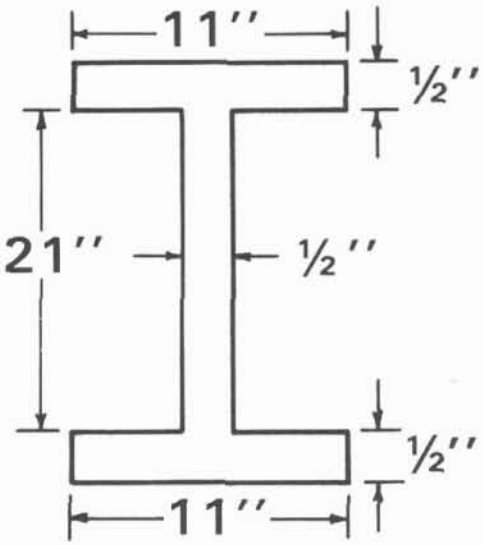
Establishing these criteria before and clarifying them during the session will make it easy to record them on the counseling statement after the session.

By using a blank counseling statement format, the counselor can state the circumstances behind the counseling session. Some examples are regularly scheduled performance counseling (not OER/EER time), on-the-spot corrections, and counseling arising from specific incidents. There should also be space to succinctly state what was said by both counselor and counselee, and room for any pertinent notes or recommendations. With a little effort, this kind of counseling statement will provide a meaningful gauge of the soldier's growth, data for future recommendations for awards, promotion or assignment, and will help strengthen leader/subordinate relationships which will ultimately enhance mission accomplishment.

Chaplain (Maj.) Wayne O. Smith is chief of the Command and Leadership Branch, U.S. Army Engineer Center, Fort Belvoir, Va. He has served as 197th Inf. Bde. chaplain and as chaplain of Camp Ames, Korea. He has a bachelor's degree in psychology, and M.A. in theology and has done doctoral work at Southern Seminary in Louisville, Ky.

The Military Engineer Problem

You have just concluded reconnaissance of a bridge targeted for demolition. During the recon you determined it will be necessary to cut four steel I-beams of dimensions shown. Using ribbon charge, what is the minimum amount of C4 (M112) explosive needed for the job?

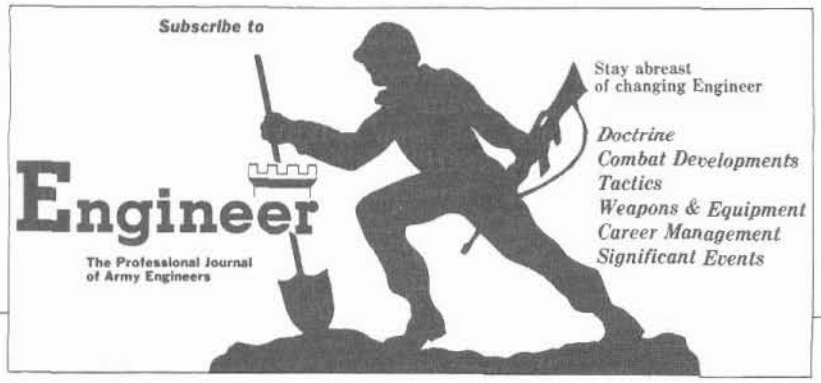


The Civil Engineer Problem

A city with a population of 50,000 produces 4 pounds per capita per day of waste. A sanitary landfill site of 20 acres has been set aside for this waste. Fifteen percent of the site must be used as buffer and the landfill height cannot exceed 15 feet.

If the trash can be compacted to a density of 800 pounds per cubic yard, how long can the landfill be operated?

Solutions page 27



Facilities Component Management

A "mature military engineering construction system..."

by James G. Winter

Army Chief of Staff Gen. E.C. Meyer, stated in his White Pater 1980 that "A key to winning the first battle, as well as the second and last battle, is an adequate sustaining capability. Maintenance, transportation and other service support gives us this needed dimension." The Army Facilities Component System (AFCS) aids in providing the sustaining capability by providing facility installation designs which fill the gaps in host nation support, replaces those facilities destroyed by enemy action, directly supports the Army in forward areas, and forms the basis for base development planning.

The AFCS is a tool to assist military planners, supply agencies and construction personnel at all levels in the construction of facilities required to support combat or rear echelon (communication zone) support elements in theaters of operation anywhere in the world.

The AFCS was initiated in 1951 when, following World War II and during the Korean conflict, it became apparent that a vital need existed for an effective, organized emergency construction and supply system.

Since its inception, AFCS has developed into a mature military engineering construction system that includes planning guidance, detailed construction drawings and computer updated bills-of-materials for approximately 2,900 facilities and 300 installations.

Some of the facilities and installations in the system include troop camps, hospitals, marine terminals, complete petroleum storage and distribution systems, ammunition storage facilities, roads, bridges, maintenance facilities, power plants, living-related facilities and operational facilities.

Army Regulation 415–16 provides the basic guidance for AFCS, while the Huntsville Division, Corps of Engineers, working in concert with the assistant chief of engineers, is responsible for updating and maintaining the system. Liaison is maintained by the Huntsville Division with the Navy, Air Force and Marine Corps for planning and to minimize duplication of design effort for similar facilities.

AFCS Data Base

The AFCS data base consists of four Army technical manuals, TMs 5–301, 302, 303, and a new AFCS user's manual, TM 5–304. The TM 5–301 contains installation and facility summaries published in four volumes for facilities and installations in temperate, frigid, tropical and desert climatic zones. It currently includes cost, shipping weight, volume and manhours required for construction of each facility, as well as three standards of construction—initial (zero to six months), intermediate (six to 24 months), and temporary (24 months to five years). In response to Joint Chiefs of Staff guidance, action is underway to eliminate the intermediate

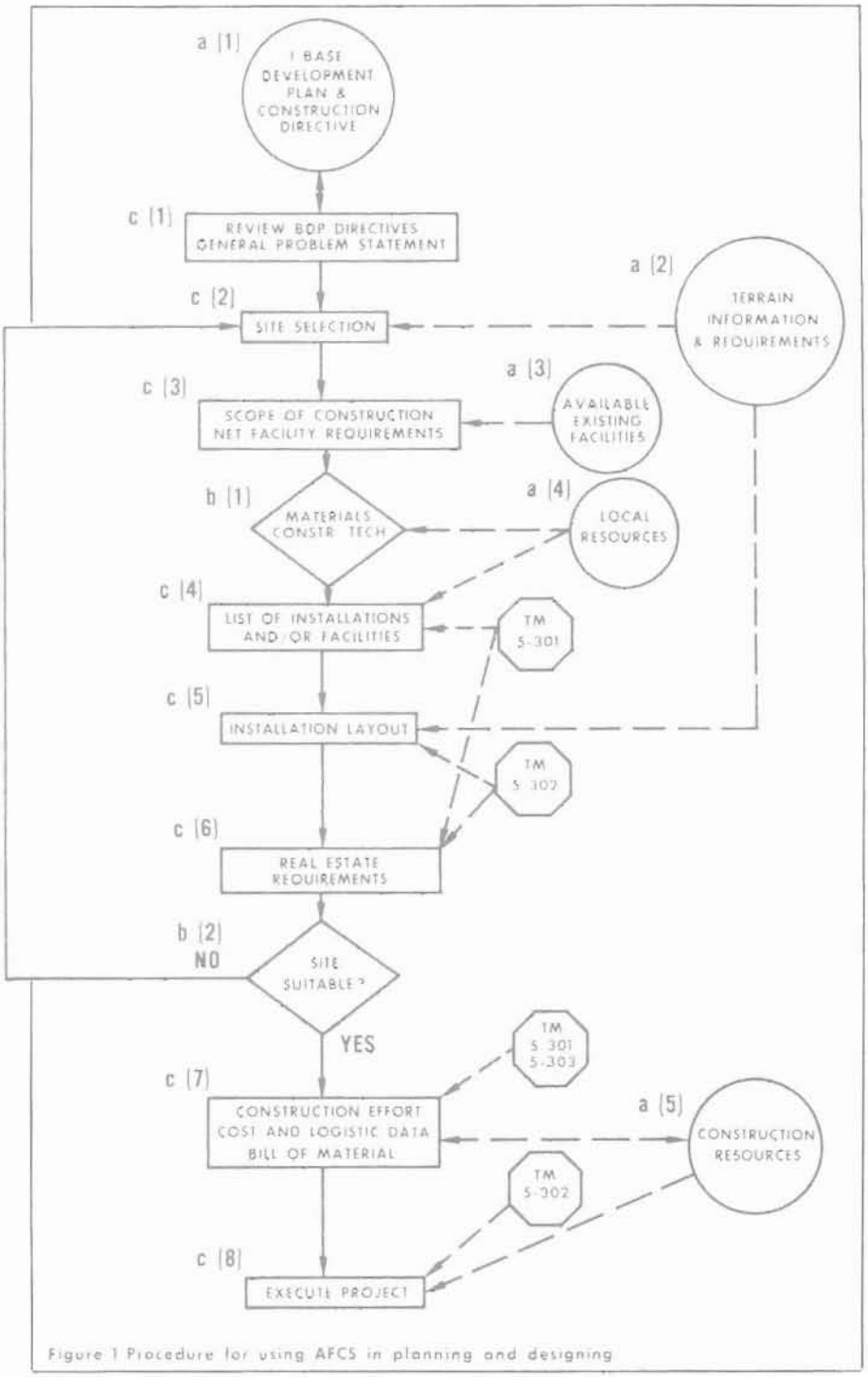


Figure 1 Procedure for using AFCS in planning and designing

standard and to reduce the temporary standard to 24 months.

TM 5–302 consists of three volumes containing site plans, utility plans and facility construction drawings for the various installations and facilities. TM 5–303 lists all of the items contained in the bills-of-materials for each facility with each item identified by national stock number. TM 5–304, the user's manual, explains the AFCS and provides detailed instructions on how to use the information in TMs 5–301 through 5–303.

The AFCS uses a building block concept to permit maximum flexibility; the "building blocks" being items, facilities and installations. An item, usually available for procurement under a national stock number, is any construction material (such as a bag of cement) that is used to form a facility (such as a maintenance building). An installation petroleum, oils and lubricants (POL) facility for example, is formed by assembling a group of facilities designed to provide a specific service or support to some military function in a theater of operations.

Planning Considerations

Figure 1 outlines the general procedure for using AFCS in planning and designing. Shown in the circles are information and directives from planning headquarters and information from local sources that need to be considered at the various steps of the procedure. The decision points and check points are shown in diamond-shaped boxes. The outputs of specific steps are shown in rectangular boxes. Inputs from the AFCS manuals (TMs 5–301 through 5–303) are shown in the hexagons. The following paragraphs are lettered, numbered and keyed to Figure 1.

a. Information and directives from higher planning headquarters and information from local sources:

(1) *Civil engineering support planning (CESP) and construction directives.* The major directive may include selected base sites, assigned support mission, operational target dates, scope of construction requirements, etc. It may also specify priorities and construction standards and allocate resources and real estate.

(2) *Terrain information requirements.* Terrain information includes map reconnaissance, site reconnaissance, climate and soil. Terrain requirements are provided in the base development plan, where concealment requirements and the expected level of mobility are specified.

(3) *Available existing facilities.* This information could come from higher planning headquarters or local intelligence sources. The existing fa-

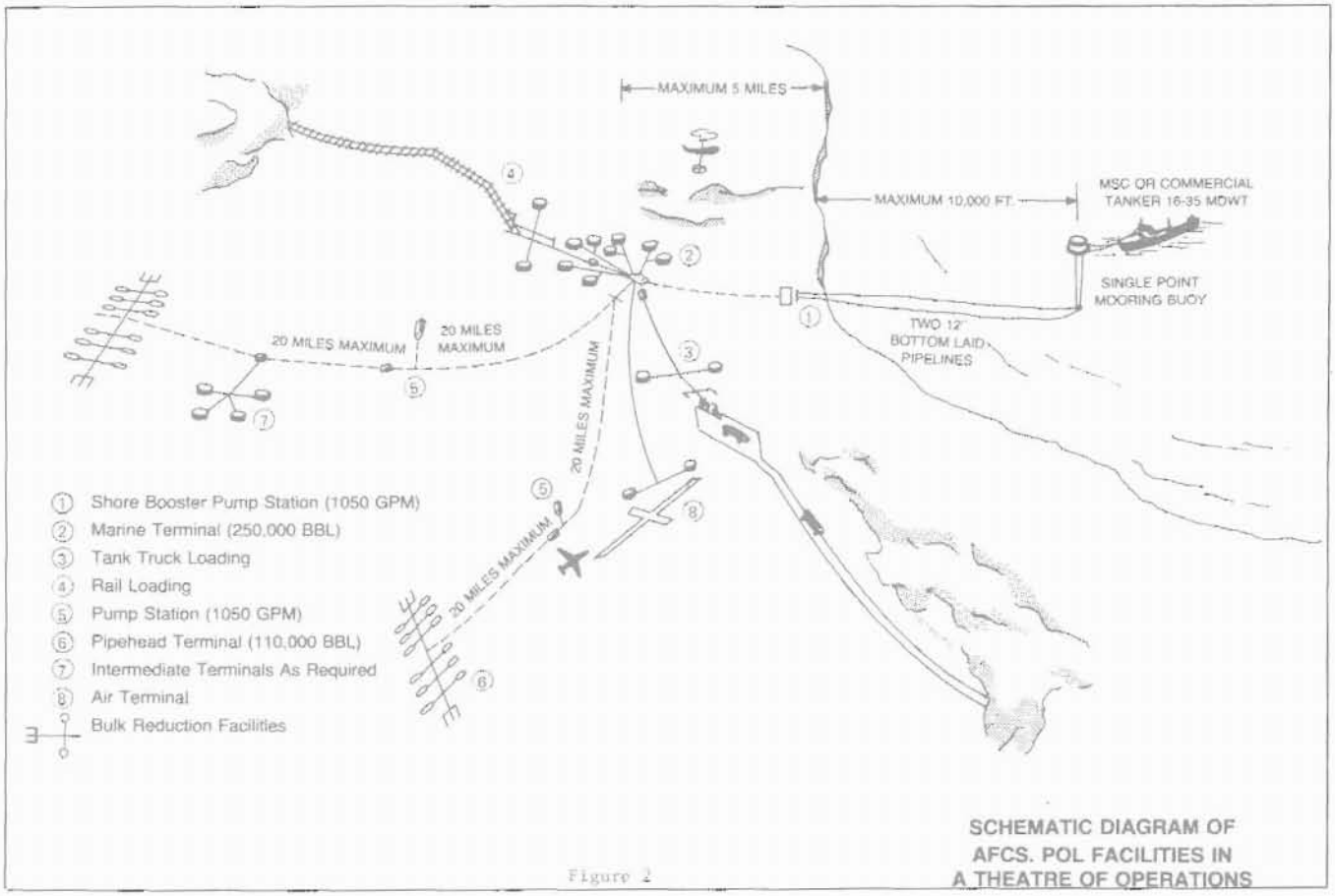


Figure 2

SCHEMATIC DIAGRAM OF AFCS. POL FACILITIES IN A THEATRE OF OPERATIONS

cilities include buildings, utilities, roads, etc.

(4) *Local resources.* This information could come from intelligence sources. Local resources include availability of skilled craftsmen, general construction labor and construction materials such as steel, lumber, cement and aggregate.

(5) *Construction resources.* These include the engineer units assigned by the higher planning headquarters, as well as available civilian laborers to perform the construction tasks.

b. Decision and verification points:

(1) *Material choice.* The choice of material depends largely on the type of facility and is constrained by the standard of construction. Several types of construction technology are available in the AFCS, including wood frame, steel frame and prefabricated buildings. The selection of a particular building type should be based on the availability of materials, time constraints and the types of craftsmen needed.

(2) *Verification of site selection.* The estimate of total real estate requirements is based on the final installation layouts. The results are compared to the previously selected or assigned sites, and steps are then taken to acquire any required additional land.

c. Planning, design and estimation stages that generate outputs:

(1) *General problem statement.* The base development plan should be reviewed for completeness and consistency. A general problem statement consists of military plans and support requirements in terms of the tasks to be accomplished by the construction unit and resources available. The statement should also include information on size, location, climate, standard of construction, etc.

(2) *Site selection.* The amount of land needed is estimated based on the construction requirements. Using this estimate, information on candidate sites is evaluated based on terrain requirements. The most likely site is inspected by a reconnaissance team, and a site is then chosen for the installation.

(3) *Scope of construction.* The net facility requirements and any useable existing facilities. Existing facilities include buildings, utilities, etc.

(4) *List of installations and facilities.* On the basis of the scope of instruction requirements and the choice of the construction standard, a list of installations and facilities, identified by their numbers, is developed. TM 5-301 is used to select the desired installations and facilities.

(5) *Installation layout.* The recommended layout of facilities within the installation is given in TM 5-302; however, based on terrain requirements and other conditions such as ex-

isting buildings, roadways, and utilities, the recommended layout may not be feasible and should be revised as necessary to meet the requirements.

(6) *Determination of real estate requirements.* The quantity of land required for the recommended facility layout is listed in TM 5-301. If the recommended facility layouts are not used, the actual required land areas should be calculated based on the revised layout.

(7) *Construction effort, cost, logistical data and bills of materials (BOM).* Estimated construction man-hours, cost and logistical data for transportation are provided in TM 5-303. The number of man-hours required for all horizontal, vertical and general construction should be tabulated and compared to the number of man-hours available from construction units in each category. If deficiencies are indicated, additional manpower support is requested. The total time needed to complete all construction can be estimated on the basis of the available manpower and the number of man-hours required for construction.

(8) *Project execution.* This step separates the actual execution of the project from the previous seven planning steps. Information input is from the working drawings in TM 5-302. The means for carrying out the project are provided by various construction resources, including engineer units and civilian labor.

During the first three years of operation of the AFCS at the Huntsville Division, many initiatives have been set in motion that will result in a marked improvement in the versatility and usability of the system. These initiatives consist of the publication of a new AFCS design manual which provides uniform design standards; utilization of decision trees on complex installations to guide the planner in selecting the proper facilities; preparation of a family of "critical path method" networks to aid combat engineers in construction phasing; total conversion of the numbering system to conform to the category codes included in AR 415-28; correlating AFCS directly to the facility requirements of each table of organization and equipment (TO&E) unit; increased emphasis on facilities directly supporting troops; and seeking methods to lower cost, weight, volume and erection time for individual facilities.

A major change has been prepared which will result in many new and needed facilities and installations being added to the system; the drawings being converted entirely to a single numbering system; and an update of all material and pricing data in the data base.

The new designs include a cross-country POL system (Figure 2); Army airfield designs including horizontal and vertical facilities for both fixed wing and helicopter units; a new family of panelized buildings; pre-engineered metal buildings; sanitary facilities; electrical modernization; administrative facility and installation update; and medical facility installations. The change should be ready for distribution before next spring.

The Huntsville Division also continuously updates the system data base with the assistance of the US Army Troop Support and Aviation Material Readiness Command (TSARCOM).

New Designs

The past emphasis on designs to support a war of several years duration has shifted to designs that are more in keeping with the shorter, highly intensive and fluid concepts of modern warfare.

New designs underway that directly support troops in the initial (0-6 months) phase include container handling ports (utilizing DeLong piers), munitions storage, a family of protective revetments, a family of field fortifications, Air Force airfields, signal intelligence facilities, theater construction materials and desert facilities. In addition, medical facilities such as mobilization health care facilities, medical depot facilities and medical TO&E facilities are under design.

It is difficult to make long-range projections for the needs of the Army, but we do anticipate designs to accommodate the Division 86 weapons systems being developed and a shift to lighter-weight, quickly deployable structures. There will probably be a reduction in the diversity of building sizes available in the AFCS as a result of a study of the actual requirements of approximately 700 TO&E units. Future designs will reflect the best sized facilities for the largest number of TO&E units.

The total Army community and other services have expressed increasing interest in the AFCS and Department of the Army personnel continue to heavily use AFCS in preparing civil engineering and support planning. The Army Facilities Component System provides a well documented set of plans and bills-of-materials which should meet the various facility and installation requirements of the Army in theater of operations anywhere in the world.

James G. Winter, chief of the Army Facilities Components System section at the Huntsville Division, U.S. Army Corps of Engineers, has participated in or managed the design of major DoD construction programs since joining the Corps in 1955, including launch and launch-support facilities for NASA, the Air Force and the Navy at Cape Kennedy; and SAFEGUARD ABM support facilities and munitions production base facilities for the Huntsville Division. Mr. Winter is a graduate of the U.S. Merchant Marine Academy and is a civil engineering graduate of the University of Florida.

The Engineer Solutions

Military

Identify and measure critical dimensions as shown in the drawing. Determine the amount of explosive required using the following formula.

TC—charge thickness | WC—charge width
LT—target length | TT—target thickness
LC—charge length

TC = ½ TT or ½″ min = ½ (½″)
= ¼ < ½″ min TC = ½″

WC = 3TC = 1 ½″

LC = LT = 2 (A+B) + C

LC + 2 (10.5″) + 20 = 21″ + 20″
LC = 41″

(Volume of charge) VC = TL × WC × LC + ½″ × 1½″ × 41″
VC = 30.75 cubic inches

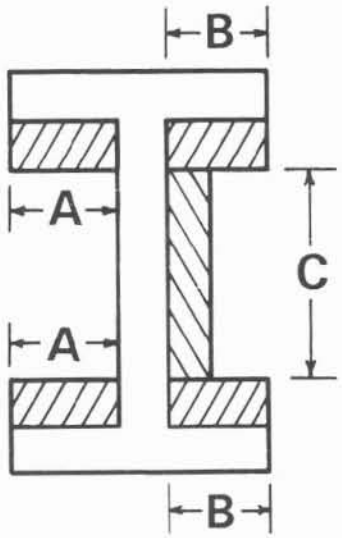
(Volume of one block C4) VS = 22 cubic inches

BI = Total blocks C4 required (1 beam)

$$BI = \frac{VC}{VS} = \frac{30.75}{22} = 1.4 = 2 \text{ Blocks C4}$$

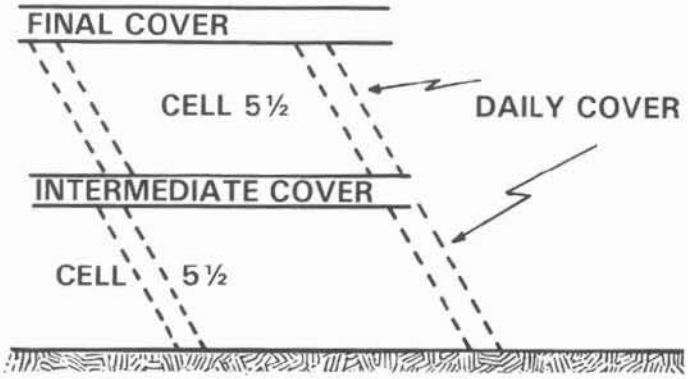
BT = Total blocks C4 required (4 beams)

BT = 4 BI = 4(2) = 8 blocks C4



Civilian

Assuming the final and intermediate covers will be two feet, the cell height should be six to 10 feet high. Daily earth cover will total 5 percent of the volume.



Available area = 20 acres × 85% effective area × 43,560 sq. ft./acre = 740,520 sq. ft.

Useable height = 15′ − 2′ − 2′ = 11 feet (includes final and intermediate covers)

Volume of waste = 11′ × 740,520 sq. ft. × 95% volume of available waste = 7,738,434 cu. ft.

$$\text{Landfill life} = \frac{\text{(Volume of waste) (Compacted density of waste)}}{\text{(lbs of waste/capita/day) (population) (27 cu. ft./cu. yd.)}}$$

$$\text{Landfill life} = \frac{\text{(7,738,434 cu. ft.) (800 lbs/cu. yd.)}}{\text{(4lbs/day) (50,000) (27 cu ft./cu. yd.)}} = 1{,}146 \text{ days or } 3.14 \text{ years}$$

The Cards Are Coming...

In accordance with AR 310–1 and postal regulations, ENGINEER is updating its mailing list.

Each unit or individual on our current list will receive a business reply card which must be filled out completely and returned to continue receiving ENGINEER.

In addition, the reply card asks readers to carefully review the number of copies now received, and to reduce or increase the number of copies according to unit needs. Department of the Army guidelines call for six readers per copy.

Please return your completed card promptly to insure uninterrupted service.

Need Article Assistance?

ENGINEER is almost completely dependent upon article submissions from the field, and many of you have, indeed, supported your branch journal with timely, informative articles benefitting the entire Corps. We realize, however, that many excellent stories go untold for lack of the time or public affairs support needed to produce your ENGINEER article.

The next time you find yourself waist-deep in a terrific story, but with no one to write (or help write, research or photograph) it, call us. We've received some funding (limited as it is) for those occasions, money allowing us to give you on-location assistance.

We, like you, are subject to time, personnel and cash shortages, but we'll do our best to give you a hand in getting your story into print. Call 703-664-3082 (AV 354).

Engineer Officer Career Management

—How we got the new program

by Lt. Col. C.H. Dunn Jr.

As most of you know, new directions in engineer officer career management have emerged following a special 13-month study of engineer management policies under the Officer Personnel Management System (OPMS). Recommendations for revitalizing engineer officer career management were approved by the Army's Deputy Chief of Staff for Personnel in March 1981; implementation began this fall and will continue over about two years.

The major tenants of the new strategy were announced in a brochure, *Engineer Professional Development,* distributed to engineer officers last summer. This article provides background to the new system by explaining some of the compelling reasons for the review and eventual revision of our career management practices.

The task of researching the OPMS engineer officer management program fell to a study team of six Army War College (AWC) students, an Army Research Institute analyst, Corps of Engineers personnel officers, three engineer advance course students and two MILPERCEN coordinators.

Acceptance of a new plan begins with the premise that the existing system needs some "adjustments." When OPMS was fully implemented in 1975, its major advantage was the capacity to serve better the needs of the large density combat arms specialties. The requirements/population graph for some of the combat arms specialties (Figure 1) depicts a dramatic lack of "branch" positions at the higher grades. Before OPMS, this non-branch time was fairly randomly managed. An infantry officer might spend one non-infantry tour in the personnel business, and the next in procurement. Such management practices did not develop the expertise needed at the senior grades in many of the career fields. The dual specialty concept was instituted to solve this problem, and after five years under OPMS, the system is now mature enough to help accomodate those lower density, more technically oriented specialites with very different requirements/population pictures. A look at the distribution of engineer requirements reflects that at most grades there are almost enough engineer positions to keep our entire inventory busy in engineer specialty jobs (see Figure 2).

At the time these data were compiled, there were insufficient captains to fill all the SC 21 captain requirements. The two most fundamental reasons, then, to examine engineer personnel management practices, were the failure of the personnel system to recognize the consequences of the under-strength engineer personnel condition, and, secondly, an engineer requirements pyramid which differed significantly from larger density combat arms.

Additionally, there was concern with the adequacy of the present system to develop senior top-

ographic experts and construction managers. The problem in development of topographic experts was fairly well acknowledged by those most familiar with this area. Very simply, the "system" had not been successful in developing the number and type of topographic experts needed at the senior grades. The Army generally has good officers in this area, but they are amateurs in a business where their Air Force, Navy and civilian counterparts have much more expertise.

Whether or not the system was adequately developing construction managers was a controversial topic. The former Chief of Engineers felt very strongly that the personnel system was remiss in this area. He presented his position in a series of letters to high-level decision makers last fall. An extract from the Chief of Engineer's letter to the Vice Chief of Staff of the Army states:

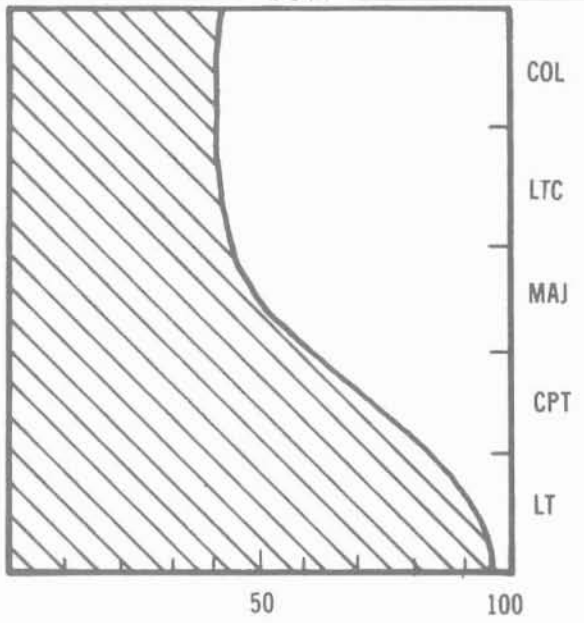
> I am personally satisfied that OPMS is trending toward not qualifying the best engineer officers to become generals in the Army.
>
> Troop duty alone is not enough to be an engineer general officer.
>
> Except for the Commanding General, Fort Leonard Wood; the Commanding General, Fort Belvoir and the senior engineer in Europe, there are no general officer positions for the SC 21 officers other than the 19 who work for me (COE).
>
> The present system is over-training the best SC 21 lieutenant colonels and colonels in troops to the point they will either not be qualified to serve as engineer generals, or I (COE) will be asked to entrust a peacetime construction management program to generals who are inadequately prepared.

The Army needs engineer general officers doing engineer work—this means a proven troop commander and an experienced professional engineer.

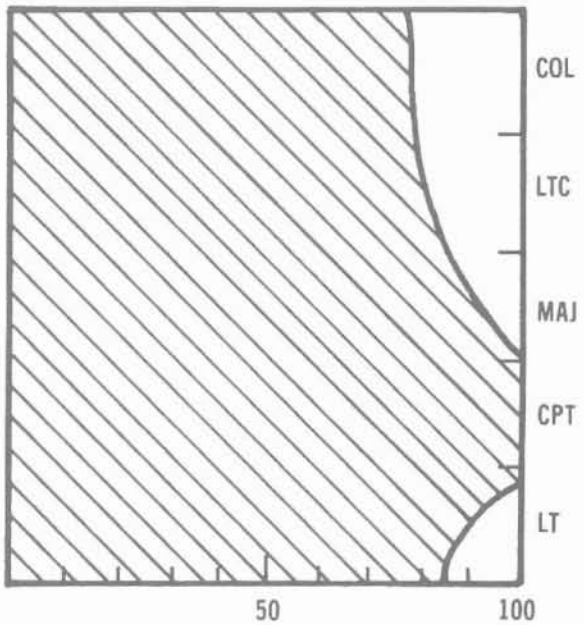
Another reason for the program review was less tangible but certainly fundamental. The desires of key personnel decision makers sometimes conflicted with the actual definition of engineer requirements as reflected in the coding requirements documents by the field. For example, the Chief of Engineer's views on what type officer experience had proven its utility to serve the Army and the nation was sometimes different from the assignments MILPERCEN made based on current SC 21 position coding in units and TDA activities. This conflict revealed the lack of a recognized, workable strategy for developing officers during the senior captain through lieutenant colonel years. To use a trite phase, all the actors in the complex personnel equation were not "playing off the same sheet of music."

Also at this time, organizational effectiveness (OE) field reports showed that, Army-wide, a negative attitude toward OPMS still existed. The report revealed:

- pessimism toward the dual-track system, especially among those with technical academic degrees.
- a feeling among many officers that they did not have sufficient opportunity to help chart their careers.
- rumors persisted and were fueled by senior officers with antiquated information.
- officers wanted more factual information with alternatives spelled out so they could analyze their career decisions.
- a plea for stability in policies.



IN, AR, FA Requirements/ Population (%) Figure 1



Engineer Requirements/Population (%) Figure 2

ACADEMIC DEGREE
1980 SC 21
POPULATION

Figure 3

	HARD ENGR DEGREE	HARD (NON ENGR) DEGREE	SOFT DEGREE
TYPICAL DISCIPLINES	• CIVIL ENGR • GEN ENGR	• MATH • GEODETIC SCI	• ART • LITERATURE
TOTAL POPULATION	67%	16%	17%
LATE-ENTRY ENGINEERS	73%	18%	9%

• personnel briefers frequently presented information at a level too technical to be understood by audiences in the field.

The OE researchers also discovered that many officers were either unaware of the amount of career and professional development information in the *Army Times,* branch journals and personnel periodicals or they failed to read them.

Through their own field visits, AWC study participants confirmed that the above perceptions generally applied to the engineer segment of the Army population, and they remained very sensitive to those findings while developing their plan. The new strategy had to be pragmatic enough for all centralized decision makers to support, give sufficient flexibility in meeting critical Army engineer requirements, enhance stability by being based on factors that were not likely to change in this decade, and provide opportunities for officers to share in their career management.

One factor became apparent in the early stages of the study—the limited utility of the past experience profiles of current senior engineer officers. It was no longer possible to develop our junior officers to have the same general experience profile as our serving senior engineer officers.

A review of officer record briefs (ORBs) of serving colonels reflected a population that had served an average of 7.1 PCS tours within the mid-captain through lieutenant colonel window.

These senior engineers were experienced in troop and construction management because they underwent fairly frequent peacetime moves and served in multiple positions during war. In the 1980's, however, officers are becoming stabilized. It is estimated that engineer officers will average about five PCS tours during the mid-captain through lieutenant colonel window. In addition, a professional development strategy cannot rely on a war to produce the experience an officer corps needs. We do not have, in our recent past, any "peacetime-grown" engineers to contrast with our projected 1990 engineers, so the utility of our past experience base is limited.

A review was also needed to accomodate dramatic changes in engineer demographics. Major alterations have taken place in the areas of academic background and when engineer officers join the specialty. A plan was needed to assimilate the growing number of engineer officers with academic backgrounds in non-engineer or non-physical science disciplines (Figure 3).

While the engineer specialty has always had some officers with non-technical academic backgrounds, most of these officers were products of a university curriculum that was heavily influenced by the "Sputnik era" of the 1960s. In those days, history majors received some math and science courses as part of their core curriculum. Today, many universities offer degrees requiring little or no math/science background. Also today, the competition for the limited engineer graduate resource is becoming more intense. A recent study conducted by the College Placement Council indicated there was a 53 percent increase in the demand for engineers between 1978 and 1979 and that 63 percent of the jobs offered to new college graduates went to engineering students. While the demand for engineers is increasing, the supply is leveling off and is projected to decline in the 1980s. The Army has centralized assignment procedures to insure that ROTC accessions with technical backgrounds are placed into engineering or ordnance affiliated specialties, but, even with these efforts, a large number of officers without "hard skill" degrees are given the SC 21 specialty to meet the Army's engineer requirements.

As long as the Army pursues such a course, it incurs a responsibility for providing ways for capable officers with a non-technical background to progress through the system. Since most young

officers look first to their battalion commander for career guidance, the personnel system managers need to give middle managers the information that is essential for effective counseling of energetic young officers, regardless of academic background. A sound professional development strategy must provide ways for non-technically trained officers to progress based on their aptitude and interest in technical arenas. This is not to say opportunities will ever be equal among all career paths for this has been, and will continue to be, an unrealistic expectation. All the officer corps really asks is that opportunities for progress be reasonable in multiple career tracks.

A second demographics transition is the extent to which officers join the SC 21 specialty later in their careers. In the foreseeable future, almost four-of-10 engineer officers will acquire SC 21 as an additional (late entry) specialty. This is necessary to fill the extensive field grade engineer requirements which cannot be met from the available company grade accession (initial entry) SC 21 population (Figure 4).

Until year group (YG) 73 was given their added specialty designations, the SC 21 population was about 95 percent initial-entry engineers. However, this YG population had dwindled to only 155 officers so, to aid in meeting the SC 21 field grade needs, an additional 125 YG 73 officers (most from the combat arms) were given a late-entry specialty of SC 21. Population mix projections show a sizeable portion of our engineer family will continue to join the SC 21 specialty at the late-entry point.

With the advent of this large influx of late-entry engineers, the engineer community must work together to assist them in the assimilation process. The long-term welfare of the entire engineer population will be significantly affected by how well this assimilation takes place.

Finally, we needed to dispel the notion that the only "success" model was troop asignments, battalion command attendance at senior service college and serving as a district engineer. As field grade command tour lengths increase (based on the February 8, 1979 Chief of Staff of the Army (CSA) decision) the opportunities to command and to follow the traditional "success" track become increasingly diminished. Future engineer growth plans must ensure ways for success other than solely via the command route. The credibility of these other tracks will be established with the results of future promotion boards. Recent CSA decisions to promote by specialty with floors to lieutenant colonel and minimum floors for senior service college selections, will, in time, provide the evidence needed to show there are non-command career options leading to colonel and general officer grades.

Taken all together, these considerations were determined to be sufficient to require changes in how we do business.

Future articles in ENGINEER will address how the transition to the new plan will be accomplished over the next two years and progress made during the implementation phase.

During implementation, there are many key participants. Decision makers must provide their continued support, and the engineer chain-of-command must become proficient in counseling younger officers on their options under the new system. MILPERCEN assignment practices must conform with the parameters for mid and late-career development utilization. And, finally, each of us must determine our own interests and aspirations, then inform our personnel assignment counterparts in MILPERCEN.

Lt. Col. C.H. Dunn Jr. commands the 2nd Infantry Division's 2nd Engineer Battalion. When this article was written, he served as career program manager for specialty codes 21 & 22, MILPERCEN.

SHIFT IN ENTRY POINT OF ENGINEER POPULATION

	ACCESSION ENGRS	NONACCESSION ENGRS
EXISTING POPULATION (BEFORE '73 DESIGNATIONS)	4519 (=95%)	236 (=5%)
YG 73 POPULATION	155 (=55%)	125 (=45%)
FUTURE MIX	60%	40%

Figure 4

Career Notes

Enlisted career advisors waiting to hear from you

Career advisors at MILPERCEN's Enlisted Engineer Career Branch can answer your questions on future assignments, schools, promotions and career goals in general.

Assigned to the branch because of their extensive background in a wide variety of engineer assignments, engineer career advisors confer with personnel management specialists to insure that every soldier is properly assigned in line with professional development goals.

If you are in Career Management Field (CMF) 81, an E-7(P) or E-8 in CMF 12 or a drill sergeant at Fort Leonard Wood, contact SFC Al Henderson. SFC Billy Moore handles CMF 51, and SFC Robert Ford CMF 12.

Call them at (202) 325-7710/1/2 or Autovon 221-7710/1/2; or write the Military Personnel Center, ATTN: DAPC-EPL-E, 2461 Eisenhower Ave., Alexandria, VA 22331.

Officer 'dream sheets' are computerized

Preference statements for officers managed by the Officer Personnel Management Directorate will soon be stored in the Army's computerized Officer Master File (OMF), MILPERCEN officials recently announced.

Data is entered into the OMF and assignment personnel compares officers' preferences with Army requirements via computer. Assignment officers now review paper copies of officer preference statements.

Although the capability for storing data became available in October, the Army won't begin feeding information into the OMF until January, to allow officers time to review their current preference statements and submit changes if necessary.

Preference statements may be updated whenever an officer so desires, however guidelines in AR 614–100 encourage updating preference statements about 12 months before completing an overseas tour; about one year after reporting to a CONUS service school; or within 60 days of beginning a course at a CONUS service school during a permanent change of station, a civilian school, or training with industry. (ARNEWS)

New DA circular helpful at re-up time

When a solider considers reclassification or reenlistment out of an MOS, things like promotion potential and professional development should be carefully considered before making a final decision.

DA Circular 611–81–4, *Career Management of the Enlisted Forces,* now makes selecting a new MOS easier by listing the Army's needs for enlisted soldiers by grade and MOS, rather than by years of service (YOS).

In addition, Appendix A shows the entry/exit ("In/Out") status of a soldier's current and potential MOS, with the Army's needs reflected by codes "Y" (yes), "N" (no) and "NA" (no authorization).

The new system should help align MOS strength with Army requirements and assist in the professional development of enlisted soliders, MILPERCEN officials say.

Deep sea divers wanted by Corps

Deep sea divers are urgently needed by the Corps of Engineers, MILPERCEN reports. If you're looking for a new challenge, this may be it.

E-2 through E-4 volunteers under 30 years old are being accepted to the 12-week course. Additionally, applicants must have a minimum of 21 months service remaining upon graduation, score at least 250 on the basic combat physical proficiency test, have a GM score of at least 100, a GT score of at least 110 and swim 300 yards using the side or breast stroke in eight minutes 30 seconds.

Applicants attend the Navy's Second Class Divers Course at Panama City, Fla., and can expect assignments to Fort Belvoir, Va., Fort Eustis, Va., or Pohang, Korea.

SFC Billy Moore, AV 221–7710, can answer questions about the program and help you complete DA Form 4187 (available at your local PAC) to volunteer for training in MOS 00B.

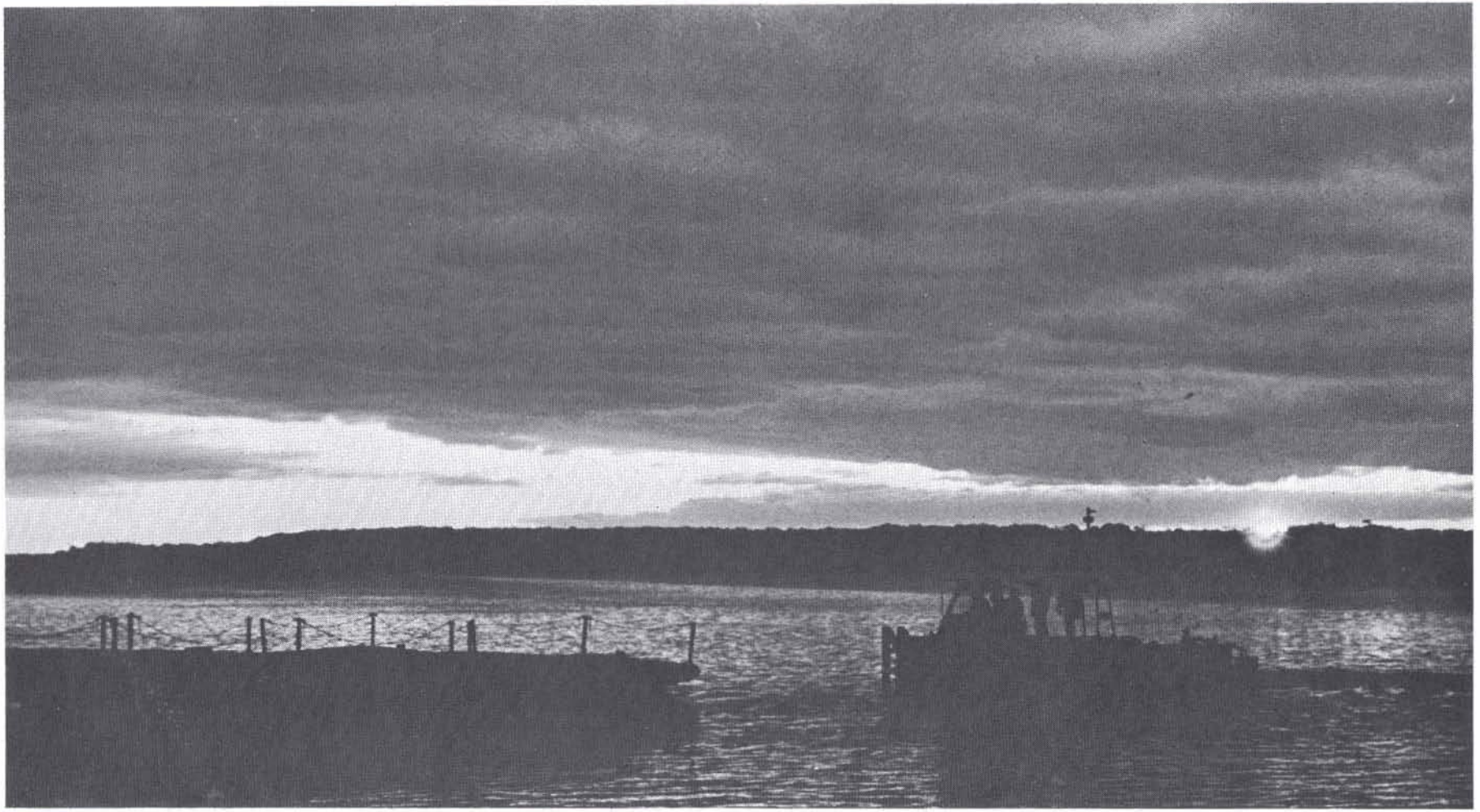
Supreme Court decision may effect reservists

A recent U.S. Supreme Court decision, *Monroe vs. Standard Oil of Ohio,* may effect some reservists.

Monroe's Army reserve duties regularly conflicted with his shift work assignments at a Standard Oil refinery. While Standard Oil did not refuse Monroe time off for drills, demote him or deprive him of vacation time, seniority or other benefits, the oil company would not adjust Monroe's work so he could put in a full schedule during pay periods that he also had reserve duty.

The law says a firm cannot deprive a worker of any "incident or advantage of employment because of any obligation as a member of a reserve component of the Armed Forces." Though Monroe believed a 40-hour week was "an incident or advantage of employment," Standard Oil did not.

The Supreme Court ruled in favor of Standard Oil.



O'dark-thirty with the 902d Engineers

Photo by Sp5 Rick Maleck