



THE ENGINEER

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CHIEF'S BRIEFS

Brevet Major General Horatio Gouverneur Wright was born in Clinton, Connecticut, March 6, 1820. He was graduated from the United States Military Academy July 1, 1841 and promoted Second Lieutenant, Corps of Engineers.

Wright was superintending engineer of the building of Fort Jefferson, Tortugas, Florida, 1846-1856. While Assistant to the Chief of Engineers, 1856-1861, he was a member of a board to study iron carriages for seacoast guns, and the adaptability of 15 inch guns for ordnance. He was co-author of "Report on Fabrication of Iron for Defenses."

From Chief of Engineers of a division at the first Battle of Bull Run, he advanced to command the famous 6th Army Corps which saved Washington D.C. from capture in 1864, and later spearheaded the final assault on Petersburg and the pursuit of Lee to Appomattox in 1865.

Wright commanded the Department of Texas, 1865-1866, and served as Assistant Chief of Engineers and member of many engineering boards until he was appointed Chief of Engineers in 1879. General Wright retired March 6, 1884, and died July 2, 1899 at Washington, D.C.

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Okay readers, we know what you're thinking — THE ENGINEER has hopped on the bicentennial bandwagon and joined the ranks of those countless bores who promote red, white and blue Christmas trees and star-spangled knee socks.

But wait just a minute now! Roll those eyeballs back down from the ceiling and give us a chance. Our intentions in preparing this cover went beyond cramming 200 years into an 11" x 15" box and snapping a picture. There's a genuine celebration here of the Army Engineer Corps' role in our nation's proud history — from the glorious 8-year struggle that fathered out neophyte republic through the civil war that threatened to destroy her; through two world wars and two police actions; through intervening eras of prosperity and despondency to new found outlooks and hopes for a brighter future. Blow out the candles and make a wish: life just begins at 200.

Models by Chris Savage

PIPELINE. PIPE

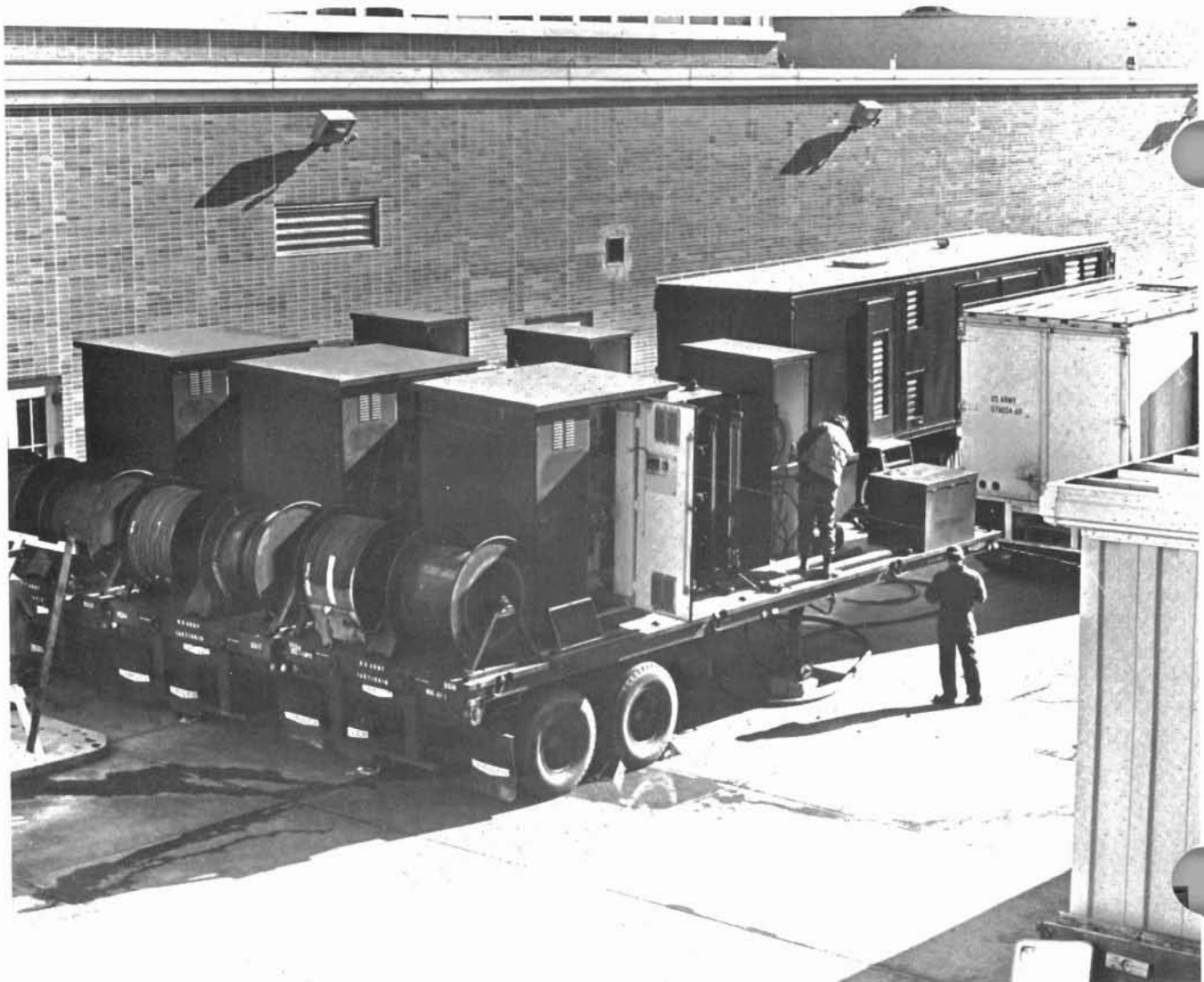
ARMY PROVIDES STANDBY POWER FOR VA HOSPITAL

When the Veterans Administration Hospital, Washington, D.C., recently had to remove its 1500-KW standby generator from service to obtain necessary maintenance, the Facilities Engineering Support Agency (FESA), Fort Belvoir,

responded to the call for emergency standby power. On 13 January, FESA deployed two 750-KW gas-turbine-driven generators and three 500-KVA substation transformers to the hospital. Military technicians from FESA connected these units to the emergency bus of the hospital where they will remain on standby duty for several weeks while maintenance proceeds on the hospital's own standby generator.

The 750-KW generator vans

are used by FESA to carry out its mission to supply power on an emergency basis for periods up to 6 months. These vans are transportable by land, sea, and air and can be hooked up and made operational within 72 hours after arrival at a site. One of the most spectacular examples of this service occurred when the Kodiak king crab processing plants were supplied with emergency power by flying generators to the island.



LINE. PIPELINE.

WE WERE THERE . . . BUT NOT FOR CONQUEST

This is the title of the new Corps of Engineers Bicentennial film produced by OCE. Running 28 minutes in color, this 16mm film depicts the role of the US Army Engineers in the development of our country and the contributions made by the Army Engineers in peace and war for 200 years. The film traces the history of the Corps from its inception in 1775 to the present. It is available from the OCE Divisions and Districts on a loan basis. When ordering the film, give the name and address, including zip code, of the person and/or organization assuming responsibility for the film.



ENGINEER ARTEP PRODUCTION

The Army Training and Evaluation Program (ARTEP) are written by the Collective Training Division, Directorate of Training Development, USAES. Currently eleven ARTEPs have been programmed to cover the different types of engineer units. Below is a chart showing these proposed ARTEPs, the editions in print, dates of publication, and current status. Those indicated as final editions are DA printed and are available through AG publication channels. Test editions may be requested through:

US Army Engineer School
Department of Army Wide
Training Support
Fort Belvoir, VA 22060

ARTEP	UNIT	EDITION	DATE	STATUS
5-145	Engr Bn, Armd & Mech Div	Test Final	Jul 74 Sep 75	Superseded Approved For Use
5-25	Engr Bn, Abn, Aslt & Inf Div	Test	Jan 76	Approved For Use
5-35	Engr Cbt Bn, Corps	Final Revised	Aug 74 Mar 76	Superseded (Supply Exhausted) Approved For Use
5-115	Engr Cbt Bn, Heavy	Test Final	Apr 75 Jun 76	Approved For Use (Supply Exhausted) To be Published
5-64	Engr Float Bridge Co	Test	Jun 76	To be Published
5-74	Engr Fixed Bridge Co	Test	Sep 76	To be Published
5-54	Engr Cbt Equip Support & Abn Light Equip Co	EXACT AVAILABILITY DATES NOT YET DETERMINED		
5-67	Engr Const Co			
5-335	Engr Topo Bn			
5-52	Engr Cmd, Bde and Gp			
5-500	Engr Cellular Tms			

HERE'S WHAT'S NEW

The United States Army Engineer School (USAES) continues to be in the forefront of TRADOC's reorganization and revitalization of training literature. In November 1974, TRADOC announced the "1000 Good Books" program which proposed a reduction of TRADOC's inventory from 1700 manuals to 1000. The role of the USAES is to reduce 188 manuals to 123.

However, this program is more than a simple reduction in quantity. It involves an upgrading of the quality of the literature and the production of several new important types of books.

A key element of the program is the "How To Fight Manuals." Lessons learned from recent and past conflicts about the effectiveness of modern armaments, the difficulties of survival and the complexities of modern warfare indicate that the old tactics are no longer adequate or applicable. The analysis of these "lessons learned" will be used in the "How To Fight Manual" to outline what must be done to win the first battle of the next war. The contribution of the USAES covers the employment of divisional and nondivisional engineer units in support of tactical operations.

The USAES has prepared a draft copy of FM 5-X, "How To Fight Manual" which replaces:

FM 5-135, Engineer Battalion, Armored Inf. & Inf. (Mech) Div

FM 5-136, Engineer Battalion, Airborne & Airmobile Div

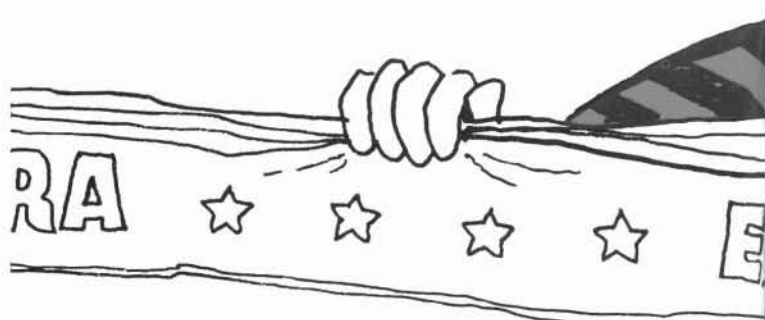
FM 5-142, Nondivisional Engineer Combat Units

The revised manual describes the four basic engineer roles:

- Enhance friendly mobility
- Impede enemy mobility
- Provide protective and defensive shelter
- Fight as infantry

The draft edition is presently in the field for review. In addition, the USAES is nearing completion of a draft copy of another "How To Fight Manual," FM 90-7, "Barriers, Obstacles and Denial Operations." This will replace FM 31-10, "Denial Operations and Barriers."

Another important element for which the USAES has responsibility is the production of the *Soldiers Manual*. Detailed information can be



IN TRAINING LITERATURE

2LT Ralph C. Davis

obtained from an article, in the Oct-Nov-Dec 1975 issue of *The Engineer*, by CPT Robert Formo entitled, "The Engineer Soldier's Manual."

Training Circulars (TCs) continue to be a good means for quick coverage of a single topic. The USAES is currently producing TC 20-32-2, "Employment of the M-56 Helicopter Delivered Mine System" and TC 5-210, "Maintenance Tips To MAB Platoon Leaders."

TC 20-32-2 provides guidance to the commander and his staff at battalion level or higher on the employment of the M-56 Scatterable Mine System. It explains the characteristics of scatterable mines, density, command and control measures, and reporting. TC 5-210 is a collection of tips gathered from experienced MAB platoon leaders with a handy set of checks to assist his unit in maintenance. Safety hazards, checks, and services and maintenance plans are discussed.



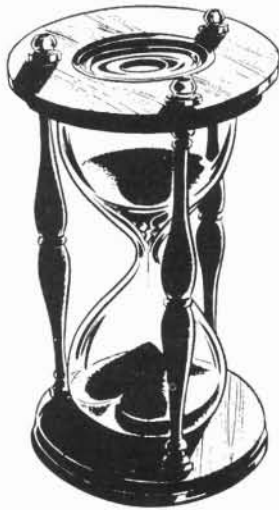
Over the past several decades, the nature of combat has changed significantly. Never before has the US been faced with the challenges of the battlefield. The TRADOC Bulletins help meet this challenge by providing timely information on weapons, tactics, and training. They also explain why we fight the way we do. The USAES has provided input to the recently published TRADOC Bulletin No. 6, "*Countersurveillance and Camouflage*," which describes the advantages of camouflage techniques and materials such as pattern painting, improved camouflage paint, and the lightweight screening system. In addition, it discusses principles that must be employed by commanders to avoid enemy detection by visual, infrared, and radar devices. It also re-emphasizes the importance of camouflage fundamentals and camouflage discipline.

Along with the new types of training literature being developed, the Field Manual continues to be important. The USAES is currently involved in the revision of several FMs applying innovative presentation methods, and using layouts, illustration and typography to enhance them. The manuals nearing completion are FM 20-32, "*Mine/Countermine Operations*," and FM 5-34, "*Engineer Field Data*," commonly known as the "Bible" for engineers.

The old standard, tan-covered FMs and TMs are rapidly becoming obsolete. Today's innovative styles, techniques, layouts, and up-to-date information are a necessity if the increasing demands of the modern Army are to be met.

2LT Ralph C. Davis is currently assigned to the Directorate of Training Developments, USAES. He holds a BA Degree in Sociology from Norfolk St. College and is a graduate of the Signal Officer Basic Course (SOBC) at Ft. Gordon, Georgia.

THIRTEEN HOURS TO BATTLE



Lt. Gerald T. Hopkins

Colonel Richard Gridley was old when the Revolution began. He had just turned 65, and many of his fellow officers believed he was too old to be a good soldier. Yet, the years which bestowed age also bestowed experience.

Gridley has studied under the British military engineer John Henry Bastide, who prepared the fortifications of Boston. During the Colonial Wars of Great Britain and France, Gridley supervised the engineering requirements for the siege of Louisbourg. He built Forts Halifax and William Henry, and served under Wolfe in Quebec.

Several years prior to the Revolution, Gridley retired from the Army and settled in New Hampshire, ready to enjoy the lazy days of his golden years. The Revolution interrupted his respite and dragged Gridley from retirement. Yes, he thought, he really was too old for another war. Nonetheless he took the job as Chief of Engineers for Massachusetts—a call more to Bostonian loyalty than patriotic fervor.

The war had been going badly for the colonists. Realistically there could be no other course for the war, considering the capabilities of the British Army and the colonial militia. Gridley knew this. Why couldn't he be back in a good regiment with proper British sappers to construct fortifications? Instead, he headed a motley group of farmers, blacksmiths and colonial vendors who didn't know the difference between an irrigation ditch and a redoubt. War did bring hardships; the lack of skilled military engineers was just one more. Gridley tried to remember the last time he had a good cup of English breakfast tea. Just another hardship.

Everyone knew that a British attack was imminent at either the Charlestown Peninsula or the Dorchester Peninsula. Both offered the tactical advantage of the hills which overlooked Boston Harbor and the Charles River. General Howe had boasted of his intention to take the Charlestown Peninsula, which offered Moulton's Hill, Breed's Hill and Bunker Hill. The British would commence their attack on the Charlestown Peninsula at 1300 hours, 17 June 1875.

Colonel Gridley remembered the staff meeting he attended the evening before. He was still angry over the final decision. The officers debated on how to defend the Charlestown Peninsula. Gridley wanted to construct the main fortifications on Bunker Hill — the tallest hill on the peninsula — and use the other two hills as outposts. He reasoned that since it could not be flanked, being so close to the peninsula neck, Bunker Hill was the obvious. He argued that if Bunker Hill could be fortified and defended, it would be impregnable.

The others wouldn't listen. General Putnam asked for a consensus. "Old Putt" favored the Breed's Hill fortifications. The General figured that if the hill displayed the main defense, the colonists could strike the British as soon as they landed and use Bunker Hill as a "fallback" position.

Gridley thought, "What does Putnam know anyway?" Putt was just an illiterate farmboy at heart, even with his multitude of combat experi-

ence. After all, Gridley was the chief engineer. A vote was taken and the officers "agreed" to fortify Breed's Hill first — a decision they, later, openly regretted.

The midnight air was chilly for Boston in June. The cold air carried noises much farther than usual, or so it seemed. The streets of Charlestown were unnaturally quiet in anticipation of the oncoming British attack. Colonel Gridley devised a strategy for the defense.

He would construct a redoubt and one hundred yards of breastwork extending northeast on Breed's Hill. Farther to the north he would build a stone wall or rail fence blocking passage to Bunker Hill by flanking Breed's Hill. There were now 3000 colonists on the peninsula, only a third of whom would construct defensive fortifications. Gridley had even less men under his direct control. He had thirteen hours to construct all the necessary fortifications before the British attacked.

The colonists were inexperienced in engineering and were working at night. Absolute silence was demanded — no talking, only muffled digging. Gridley strained his weary eyes to visualize his plans for Breed's Hill. He saw lights on the water — these belonged to the confident British casually waiting the next day in their mighty "ships of the line." He saw ragged men working in the darkness with primitive tools, stripped of speech, yet spirited and determined. Gridley felt strangely proud and confident.

At 0400 hours, the daybreak cast faint light on the newlybuilt fortifications on the peninsula. General Gage was awakened aboard the sloop *Lively* and could not believe his eyes. He saw veritable fortifications on Breed's Hill where several hours ago none existed. He examined an earth mound about 150 feet square; probably a redoubt he thought. He noticed some type of breastwork extending in a linear fashion and packed behind timber retainers. At first Gage was startled; then he became amused. He enjoyed the fox hunt more than the rabbit hunt.

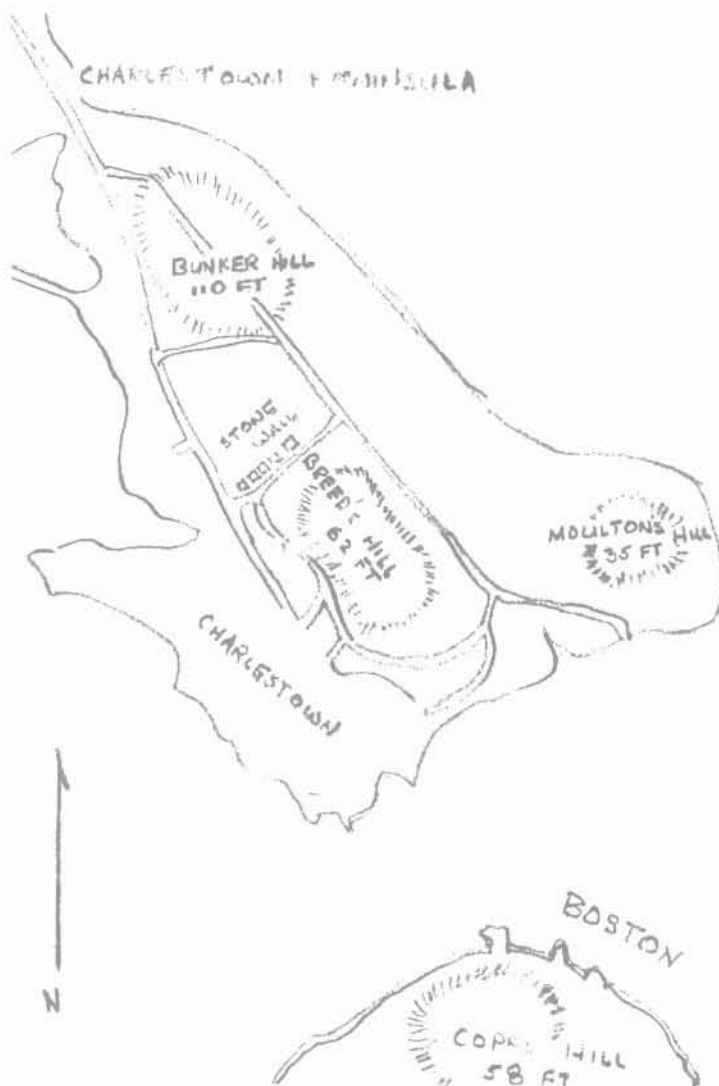
An order was given to start a bombardment; however, the attack would still commence at 1300 hours. As a British officer, Gage felt no real threat from the colonists. Let them eat cannonballs for breakfast!

At the first cannon shot, Gridley was impressed. He was not impressed by the aim of British gunnery, but rather at the ability of his redoubt to withstand fire. In a scant four hours the colonists had built a 45 yard square redoubt strong enough to resist British cannon fire all day. These were of earth, stone, and timber. The colonists added more earth and stone to the breastwork during the bombardment. The result:

the fortifications actually looked larger, thicker, and stronger after the bombardment than before.

The colonists also built Gridley's "rail fence" — a structure framed by timber holding rocks and stone. This wall obstructed the attack route to Bunker Hill and was covered by the fire of the colonists. Gridley also emplaced green hay and grass in front of the wall. Although this provided no protection from British fire, it gave the wall a more formidable appearance.

Let the British come, Gridley mused. He had reason to be confident; his fortifications were strong, exceptionally strong. If the colonists could display as much determination in fighting as they did in engineering, the British could be beaten. Gridley peered over his redoubt, saw smoke on the water, felt the thud of cannonball into solid earth and felt secure.



CHARLESTON PENINSULA — 16 JUN 1775

The British continued their barrage and the colonists scurried to replace any damage. Gridley

suddenly remembered a warning to him earlier in his youth: always remember flank protection! Why was he thinking this now?

In the midst of battle, he spotted a weakness in his defenses. He had adequately provided frontal protection, but the northern flank on Breed's Hill was vulnerable. There was a gap hundreds of feet long between the last breastwork on Breed's Hill and the "rail fence" farther north. He would have to fortify this flank immediately.

He decided to emplace three fleches of v shaped obstacles built of earth and wood. Since time was short, little earth was packed against the timber; instead, Gridley used green hay to give a more formidable appearance while providing little protection. He smiled as he remembered a characteristic of the American fighting man — they hated to have their legs exposed to fire, but give them concealment up to their shoulders and they wouldn't worry about their heads!

The fleches were built in record time. They served their purpose by obstructing the flank approach to Breed's Hill. The obstacle was enhanced by the militia defending it with fire. Now, Gridley confirmed, the colonists were completely prepared for the British attack. He noticed the sun hanging high in the sky; it was close to noon.

The Battle of Bunker Hill, as it became known, was won by the British. Sometimes during the three separate attacks on Breed's Hill, Gridley collapsed. This was the result of a combination of old age, exhaustion and small fragment wounds. As he was carried from the battlefield, his thoughts became random. Would death take him? What was the course of the battle?



BREED'S HILL — SITUATION 0400 HOURS — 17 JUN 1775

BREED'S HILL — SITUATION 1300 HOURS — 17 JUN 1775



Sure, the colonists had retreated, but not before inflicting enormous casualties upon Gage's attack force. Burgoyne later reported that the retreat was "no rout." One British soldier wrote a letter home stating that the rebels, "continued running fight from one fence or wall to another, we entirely drove them off the peninsula."

Official records tally British losses at about 1150 out of 2500 soldiers — 40 per cent casualties. The British officer corps suffered the worst of the casualties. Of all the British officer casualties sustained during the Revolution, an eighth were killed and another sixth wounded at Bunker Hill.

Gridley mused about his fortifications. If the colonists had fortified Bunker Hill first, the British Army could not have conquered it, he argued.

The main reason for the militia's retreat was the critical shortage of ammunition. No defense could be conducted without firepower, no matter how strong the fortifications. The colonists had proved their will to win.

This battle was to be the first time that fledgling American troops, colonial militia, were to hold their own against British regulars. Colonel Gridley's thoughts merged as he slipped into unconsciousness. His fortifications had held out; the ammunition had not. He was proud. He thought about that cup of tea.

Lt. Gerard T. Hopkins is a 1975 graduate of the U.S. Military Academy. He has completed Advanced Staff School and 2-76 Engineer Officer Basic Course. He is currently the Executive Officer, Student Officer Detachment, USAESBDE, Fort Belvoir, Va.

ENGINEER TRAINING PACKAGES

MAJ Eldon R. Johansen

Can the reserve component engineer units accomplish combat engineer tasks? The purpose of this article is to share procedures which Army Readiness Region V (ARR V) is using to improve reserve component combat engineer hands-on training. These procedures have been effective and are recommended for use in other areas of the country. This article describes the engineer training packages which are used to provide hands-on training and discusses the reasons for setting up these packages. It will also cover the content of, experiences with, and changes to various packages.

Why do we need training packages? An example of the reserve component supply effort required to support hands-on training will best illustrate the requirement. Place yourself as the supply sergeant for a combat engineer company in a separate infantry brigade. Schedule installation, breaching, and clearing of a deliberate protective minefield as one of many platoon tasks during your two weeks of annual training (AT). Where do you get the materiel to conduct this training? You have TOE equipment, engineer tape, rope, and minefield record forms available in the unit. The Reserve Components Branch of the Directorate of Plans and Training at the AT installation will provide invaluable assistance in determining where to get other items. However, you must do the leg work. You will order and receive the practice mines and firing devices from your supporting ammunition supply point. You will order and receive dummy mines and blocks to simulate TNT from the Training Aids Support Office. You will coordinate to obtain a minefield marking set from the Installation Supply Division. You will borrow steel posts and barbed wire from the Directorate of Facilities and Engineering to mark the field. Your unit must remove the wire and posts from a fence that is no longer required. You will get wooden stakes from the Range

Division of the Directorate of Plans and Training.

You will requisition materiel and submit authorization and signature cards during inactive duty training (IDT), several weeks prior to AT. The unit will send an advance party to sign for billets and to receive selected training materiel. This advance party will arrive late on Friday and the main body will arrive on Saturday. The issuing organizations will only be operational during normal duty hours. Therefore, your supply section cannot collect, consolidate, and issue materiel for training until several days into the AT period.

The net result will be that the platoons will spend a good part of their valuable training time waiting for supplies from the section or in locating, inventoring, receiving, and returning supplies themselves. The minefield example is probably typical of the supply effort required to support hands-on training for one engineer task. Tasks such as bridging, may require much less paperwork; however, more time is required for inventory. Tasks which destroy materiel, such as timber-trestle bridging and rigging, require controller coordination for funds.

The example of supply problems is a real life problem which is experienced by all units that plan for hands-on training. Similar real life problems deter site selection and training evaluation. In summary, the Engineer Training Packages have been developed to increase hands-on combat engineer training by accomplishing the following:

- Preventing loss of training time for supply actions by prestocking training materiel for immediate use.
- Preventing loss of training time by prior selection of and coordination for training sites.
- Providing training tasks with realistic performance standards so that the unit commander can properly evaluate additional training requirements.

- Providing a realistic alternative to site support work which often does not improve training.

To insure continued emphasis on hands-on training, ARR V established special coordination, supply, and assistance procedures for use of the Engineer Training Packages. The ARR V Readiness Group (RG) Engineer Teams are responsible for:

- Selecting and reserving training sites.
- Prestocking materiel and meeting the reserve component unit at the site with the non-TOE materiel required to support the training.
- Providing technical assistance as required.

Although the RG Engineer Teams provide materiel and advance coordination, the reserve component unit is still responsible for the following:

- Providing advance homestation training to the unit.
- Supervising unit performance on the job site.
- Providing TOE equipment.
- Evaluating performance to determine additional training requirements.

The first package was titled the Combat Engineer Training Package. This package included platoon level engineer tasks and a company level area defense problem. Initial results of the use of this package by 20 companies during AT74 exceeded the most optimistic expectations. The platoons were challenged, worked hard and enjoyed the satisfaction of completing difficult engineer tasks. Platoon leaders conducted hands-on training in combat engineer subjects without significant loss of time for logistics and coordination. Unit commanders determined the added training requirements for using units. Although platoon performance varied significantly, several overall comments are applicable:

- The Platoon Sergeants generally had the technical proficiency to supervise task accomplishment; however, squad leaders did not have this proficiency. Unit leaders had the leadership ability to supervise their men if they knew what had to be done. Unit advance homestation training did not properly prepare the unit to accomplish the task.
- Many platoons were a collection of individuals without a squad structure within the platoon.
- Units conducting repetitive float bridge training on lakes had developed construction, coordination, and safety procedures which are only applicable to still waters.

Revisions to the ARR V Engineer Training Package program were extensive for AT75. These changes were required because the original Combat Engineer Training Package was not a good

tool for correcting the deficiencies noted above.

A Combat Engineer Squad Training Package was added. The purpose of this package is to develop squad proficiency in combat engineer subjects and to allow the squad leader to develop individuals into a working squad. Tasks for the squad package are listed in Table I.

COMBAT ENGINEER SQUAD TRAINING PACKAGES TASKS*

TASK	HOURS TO COMPLETE
1. Disable bridges.	4
2. Construct barbed wire entanglement.	1
3. Conduct ground recon to locate targets.	4
4. Prepare a target folder.	8
5. Breach artificial obstacles using explosives.	2
6. Support assault phase of river crossing.	1
7. Layout a Bailey bridge site.	1
8. Construct an M4T6 fixed span.	2
9. Construct a timber bent abutment.	4
10. Conduct bridge reconnaissance.	4
11. Conduct road reconnaissance.	4
12. Construct corrugated metal pipe (CMP) culvert.	4
13. Layout a 20 x 20 T/O building.	1.5
14. Perform carpentry work.	1
15. Construct shears, gin pole or boom derrick.	2

*Extracted from Letter, HQ, ARR V, Fort Sheridan, IL 60037, AFKB-RR-A-EN, 22 Nov 1974, subject: AT 75 Squad Training for Combat Engineer Battalions.

A Combat Engineer Bridging Package has been added. The purpose of this package is to conduct realistic float bridge training in moving water and to develop proper coordination between units. Tasks for this package are listed in Table II.

COMBAT ENGINEER BRIDGING PACKAGE TASKS*

1. Construct and dismantle a 600' M4T6 bridge.
2. Construct, operate, and dismantle a trail ferry.
3. Conduct an assault river crossing.
4. Construct, and dismantle M4T6 and light tactical rafts.

*Extracted from Letter, HQ, ARR V, Fort Sheridan, IL 60037, AFKB-RR-A-EN, 7 Feb 75, subject: Combat Engineer Bridging Package.

The Combat Engineer Training Package was renamed the Combat Engineer Platoon/Company Training Package. This package was also changed to challenge the better trained unit and to provide combat engineer training to construction and utility units. Tasks for this package are listed in Table III.

A "teach the teacher" program was included in each package to better prepare leaders to supervise their units. This training is conducted at the reserve component unit's homestation prior to AT. Several procedures are used to accomplish the training. USAR schools sponsor and teach the classes for some units so that training can be conducted during non-IDT time with participants

TABLE III

COMBAT ENGINEER PLT/CO PACKAGE*

BASIC TASKS		HOURS TO COMPLETE
1. Construct a 60' double single Bailey bridge.		4
2. Dismantle a 60' double single Bailey bridge.		4
3. Construct a 4 float M4T6 raft.		4
4. Dismantle a 4 float M4T6 raft.		4
5. Construct a timber trestle bridge.		4
6. Dismantle a timber trestle bridge.		4
7. Install a 50 meter minefield of 1-2-2 density.		4
8. Breach and clear a 50 meter minefield of 1-2-2 density.		4
9. Construct a light tactical raft (LTR) and install anchor towers and cable for M4T6 floating bridge.		4
10. Dismantle an LTR and anchor towers and cable for M4T6 floating bridge.		4
11. Conduct a company area defense and night withdrawal.		4
ALTERNATE TASKS		
1. Construct a 120' single Bailey bridge with intermediate panel pier.		**
2. Dismantle a 120' single Bailey bridge and intermediate panel pier.		**
3. Defend a platoon defensive position to include complete preparation of minefield obstacles and fortifications.		**
4. Bay load a 60' double single Bailey bridge, haul to field location and construct at a field location.		**
5. Remove Bailey bridge and restack.		**
6. Conduct infantry platoon battle drill.		**
7. Conduct closely supervised platoon demolition tasks.		**
8. Conduct demolitions training for demolition personnel.		**
9. Construct and dismantle a 330' footbridge to include anchorage system.		**
10. Assemble and disassemble M8A1, MX18b, and MX19 airfield matting.		**

*Extracted from Letter, HQ, ARR V, Fort Sheridan, IL 60037, AFKB-RR-A-EN, 10 Dec 74, subject: Combat Engineer Plt/Co Training Package.

**To be determined after criteria is determined and final site is selected.

receiving retirement points. Some units schedule training for part of the unit leaders on Saturday and the remainder on Sunday during a training weekend. Other units have scheduled this training for administrative drills.

Engineer Training Packages may be difficult to assemble at other installations. Conditions in ARR V were ideal to initiate this approach to hands-on engineer training. Conditions which contributed to the success of this program included the following:

- Forward-looking commanders that understand and support hands-on training in basic tasks.
- A supporting installation at Fort McCoy that is reserve component oriented. Strong installation support is essential to set up and operate these packages.
- A Readiness Group at Fort McCoy to accomplish advance planning, to collect materiel, and to establish training sites.
- A high density of engineer units in ARR V and a high density of engineer units undergoing training at Fort McCoy.
- A large US Army Reserve Equipment Storage Site at Fort McCoy to support required training with equipment.

What is the future of Engineer Training Packages? The training program for reserve component units is moving and dynamic. The packages must have the flexibility to meet changing unit training requirements. Repetitive use of the packages during succeeding ATs will increase the capability of using units. As capability increases, the reserve component leaders will be able to provide all on-site technical proficiency. They will also be able to provide "teach the teacher" instruction to new leaders within the unit. This increased unit capability will lower required RG support and enable RG personnel to focus on other activities.

As unit capability increases, the requirement for use of the tasks from existing packages will decrease. This will provide time in the unit training schedule for other more challenging activities and will also allow the materiel from the packages to be used for other purposes.

Materiel problems and lack of preparation time are limiting the quality of Army Training Tests and field training exercises. Materiel and sites for squad and platoon tasks in the Engineer Training Packages may also be used for unit proficiency testing. The packages have been modified to add the test capability.

The new Army Training and Evaluation Programs for engineer units include many tasks which are not included in existing packages. Materiel which is presently on hand will support most ARTEP tasks with the flexible control system which will be used for 1976 summer training.

Hands-on training must also be improved at the homestation for the reserve component units. Only 14 of the 38 training days available to reserve component units are spent at AT. Materiel from the Fort McCoy Combat Engineer Training Packages is being used at the homestation for the reserve component unit. Units transport the materiel to homestation, conduct the training and return the materiel to Fort McCoy.

Major Eldon R. Johansen is Chief of the Engineer Team, U. S. Army Readiness Region V Readiness Group, Fort McCoy, Wisconsin. He has commanded training companies at Fort Leonard Wood, Missouri; a service platoon in Germany; and an engineer light equipment company in Vietnam. His staff assignments have been at U. S. Army Communications Zone, Europe; U. S. Army Engineer Command, Vietnam; and the 809th Engineer Battalion in Thailand. His civilian education includes a bachelors degree in civil engineering and a masters degree with specialization in sanitary engineering. Major Johansen is a registered professional engineer.

JAWZ

SFC Thomas W. Burruss

Suppose you heard a story like this:

A funny thing happened to me on my way to Thompkins Basin today. I met, would you believe, a talking Mobile Assault Bridge (MAB) named "MOE." "MOE MAB" to be exact, and he told me that his crew members had just received a brand new manual called "The Soldiers Manual for Mobile Assault Bridge (MAB) Operators." He was really excited, and his excitement prompted me to ask more about this wondrous new piece of literature. Our conversation went something like this:

ME: Tell me Moe, just what is a Soldiers Manual?

MOE: It is a manual that provides the individual soldier with a description of what the US Army and his superiors expect him to know and be able to do. It also provides a uniform training plan to be used by his unit commander and NCOIC for his OJT. You see, the basic objective of the manual is to qualify my crew members as efficient Mobile Assault Bridge operators. Once they have been trained in all the tasks outlined within the manual they can operate me effectively with a minimum of supervision. Upon completion of their training they should be able to pass the Skill Qualification Tests (SQT) given to determine their proficiency.

ME: Wow! It must be a pretty big book.

MOE: Not at all. The Soldiers Manual is designed under the new systems approach to training and while thorough, it is brief and concise so that my crew members can easily carry it anywhere they go.

ME: Tell me more, Moe. What sort of subjects are contained in this Soldiers Manual?

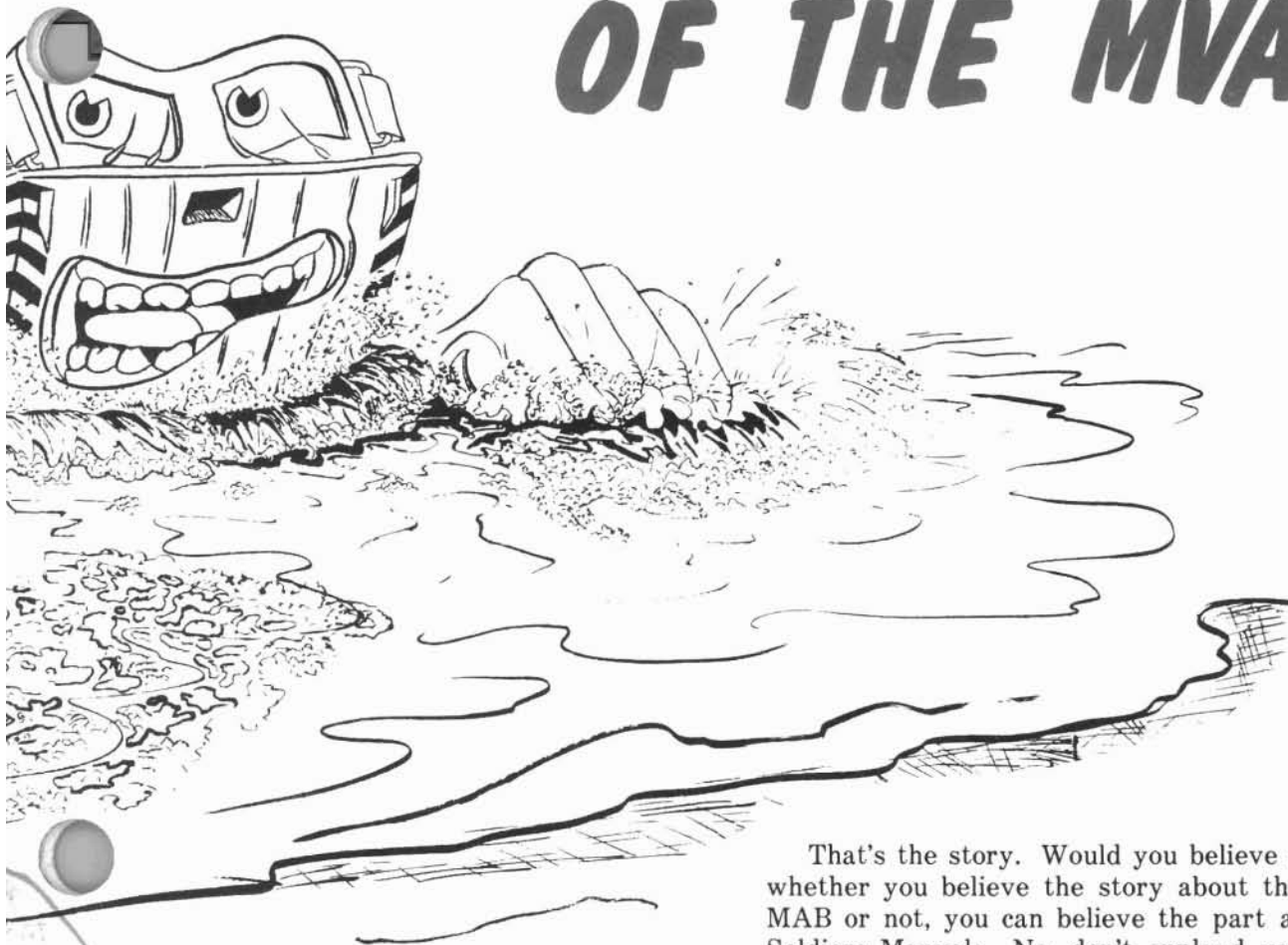
MOE: Well, first the manual tells how to qualify for training as a MAB operator. Then it outlines the career progression of the Bridgeman to include his job description, his place within the Army, his career progression, and how he can supplement his training on his own. Through the use of its task

lists and training outlines (Job Task Summary Sheets), my crew members can see exactly what tasks they are expected to perform and, more importantly, to what standard. As an added feature to the 12C Bridgeman Soldiers Manual, there are two appendices on water operations, one for each model of the MAB. They give a step-by-step course of events that take place during water operations and tells each of my crew members what he is to be doing during each phase of water operations.

ME: All of that is great Moe, but how will your crew really know when they are ready to pass their SQT?



OF THE MVA



That's the story. Would you believe it? Well, whether you believe the story about the talking MAB or not, you can believe the part about the Soldiers Manuals. No, don't applaud yet! We're not quite "out of the woods," but this type of manual is a "giant step," toward getting into the hands of operators a one-stop study guide for their particular MOS. We at the Engineer School believe we are headed in the right direction. Therefore, MOE MAB makes one request of you. If you have one of these Soldiers Manuals and have had a chance to review it, please write and tell us what you think of it. If the feedback is good, we're going to continue in this format for other MOSs. Remember, MOE is waiting to hear from you and so are we.

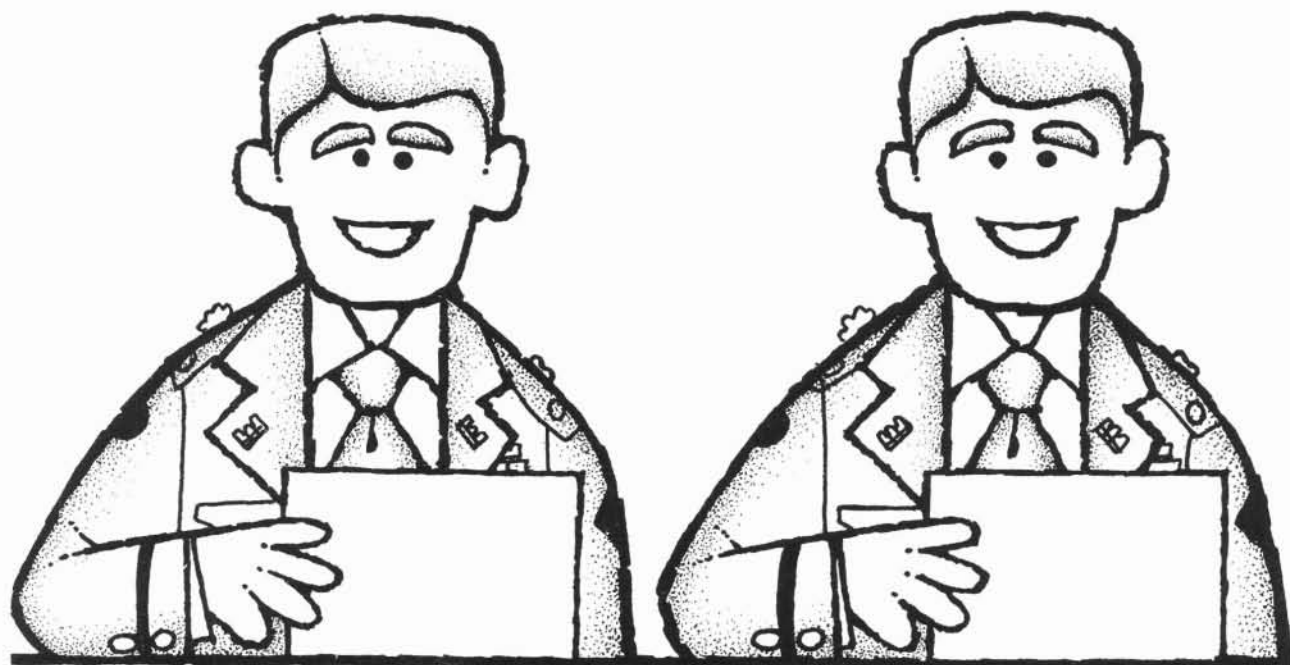
MOE: In the back of the Soldiers Manual there is an appendix on Training Skills Development and another one on Training Evaluation. If my crew members can pass the tests in the Training Evaluation Section, they should be able to pass the SQT.

ME: Moe, this new Soldiers Manual sounds great. Where can I get one?

E: The manual is already in the field in draft form for validation by Army Mobile Assault Bridge units; however, the final copy will not be available until later in CY 76 when all of the CMF-12 Soldiers Manuals are to be completed.

Sergeant First Class Thomas W. Burrus is a Project Officer for the Individual Training Division, Directorate of Training Development, USAES. A graduate of the Combat Engineer Non-Commissioned Officer Course (CENCO) in Germany and the Senior Non-Commissioned Officer Career Development Course at Ft. Benjamin Harrison, Indiana, he served with the 42d Engineer Company, Berlin Brigade, the 1st Engineer Battalion, 1st Infantry Division, and the US Army Recruiting Command in Philadelphia. His last tour of duty was with the 23d Engineer Battalion, Hanau, Germany, as a platoon sergeant and race relations, alcohol and drug counselor.

THE ENGINEER



The Corps of Engineers

The Corps of Engineers is the world's largest engineering organization. It supports the Army and the nation by its military and civil engineering works. Nearly 5,000 commissioned active duty officers make up its military leadership. To be a successful engineer officer you must be a *soldier*, an *engineer* and a person willing to *dare* and *do*. The Corps of Engineers is a combat branch of the Army but service with the Corps as a member of the Engineer specialty is open to all qualifying officers without regard to branch. The thrust of this article is to provide insight so that you might assess your talents and examine your prospects for success as an Army Engineer under the Officer Personnel Management System (OPMS).

LTC Edward G. Rapp



R SPECIALTY AND YOU

"Encompasses positions concerned with the tactical employment of engineer units. Evaluates intelligence, estimates situations, and formulates decisions. Coordinates deployment with other units. Commands attached elements. Directs communications, locations and construction of positions and camouflaging of positions and equipment. Directs employment of demolition munitions, barriers and fortifications systems. Optimizes the use of available engineer equipment, materials, and time to enhance mobility and combat power of the combined arms team. Directs topographic and geographic intelligence operations to include the production and dissemination of maps and geodetic data. Directs employment of engineer resources in military construction, facilities management and those civil works tasked to the Army. Directs training, administration, supply, maintenance, transportation and security activities of units. Prepares to fight as Infantry."



History

The Engineer history and heritage is long and colorful. The Corps of Engineers of today traces its lineage directly to an order given, on 16 June 1775, by General George Washington, appointing Colonel Richard Gridley as Chief Engineer. The first mission, prepare the defense of Bunker Hill against the British attack. But long before — back into the antiquity of organized battle — the art of war had been dependent in large measure on the skill and technology of its soldier-engineers. The Corps of Engineers is fundamentally a military engineering organization in which the ability to fight as infantry is inherent in its mission. All other missions — civil engineering, geodetic studies, civil works, scientific research and others — are offshoots. It is this basic purpose, that of engaging and destroying an enemy in battle, which US Army engineers must always be prepared to accomplish.

Job Functions of Engineer Officers



To better visualize the scope of the job commands to be placed on you as an engineer officer, we should look briefly at the functional areas within the **ENGINEER** specialty. These functions are described concisely in Army Regulation 611-101 as follows:

Within this broad specialty function, the Army has identified and categorized four major groupings of positions, all of which require similar skill qualifications and within which duties are closely related. These are Combat Engineer, Construction Engineer, Engineer Management Officer and Topographic Engineer. Listed below are descriptions of each of these job areas and the special skills necessary for success in the job at the basic level. For flexibility in personnel management and to meet combat contingencies, it is desired that officers be cross trained and obtain experience in as many of the following job areas as practical. As a general rule, the more duties that an officer can respond to with in-depth expertise, the greater his worth as an engineer officer.

Combat Engineer: Officers assigned to these jobs command or assist the commander or an engineer unit engaged in combat engineering. There are no specific prerequisite skill requirements; however, a degree in engineering or engineering-related disciplines is desired. Officers are trained to basic entry skill levels at the Engineer Officer Basic Course. Typical duty positions include assign-

PROFESSIONAL DEVELOPMENT GUIDE

ENGINEER

SPECIALTY (21)

Fig. 1

PHASES OF DEVELOPMENT (GRADE AND UTILIZATION INDEX)	PROFESSIONAL MILITARY EDUCATION	CIVIL EDUCATION		SPECIALTY EDUCATION	ASSIGNMENT OPPORTUNITIES (NOT ALL INCLUSIVE)
		PROGRAMS	SPECIALTY DISCIPLINES AND COURSES		
COLONEL PHASE UTILIZATION INDEX .77 Maximum utilization of developed Engineer managerial and executive talents in either Engineer specialty or alternate specialty.					Brigade/Group Commander District Engineer Engineer Staff Officer Facilities Engineer Topographic Engineer Instructor/PMS Advisor Recruiting Inspector General
LIEUTENANT COLONEL PHASE UTILIZATION INDEX .70 Continue professional development in both Engineer specialty and designated alternate specialty.	Army War College Air War College Industrial College of the Armed Forces National War College Navy War College British Royal College of Defense Studies Canadian National Defense College French Ecole Supérieure de Guerre Inter-American Defense College Army War College Non-Resident Course	COOPERATIVE DEGREE PROGRAM Prerequisites: Attendance at Command and General Staff or Senior Service College. Discipline will support either this specialty or the alternate specialty. Normal period of study: 6 months immediately after completion of above courses.	REGISTRATION GOAL Registration as an Engineer in Training and as a Professional Engineer are desirable goals.	Reference: DA Pam. 351-4 Staff Officer Legal Orientation Senior Officer Preventive Maintenance Senior Officer Orientation Combat Operations	Battalion Commander Engineer Staff Officer Resident Engineer Facilities Engineer Topographic Engineer Instructor/PMS Advisor Recruiting Inspector General
MAJOR PHASE UTILIZATION INDEX .76 Continue professional development in both Engineer specialty and designated alternate specialty.	Army Command and General Staff College Air Command and Staff College Armed Forces Staff College College of Navy Command and Staff Marine Corps Command and Staff College School of the Americas Army Command and General Staff College Non-Resident Course	ADVANCED PROGRAM Utilization Required: SSC/CGSC none OCP (AR 621-1) Period of Study: 18 months or less Utilization: 3 years ADPRID (AR 621-101) Period of Study: 15 months Utilization: 3 years ROTC Fully Funded (AR 621-1) Period of Study: 18 months Utilization: 3 years Service Obligation: Three years for each year in school or portion thereof, but not more than four years.	PRIMARY SPECIALTY EDUCATION Graduate Education: Approximate Mix BUSINESS: 3% of Req ORSA Analyst Comptrollership ADPS Business Logistics Management Procurement ENGINEERING: 80% of Req Civil Engineering Engineering Management Aeronautical Engineering Nuclear Effects Engineering Chemical Engineering Engineering Physics ORSA Engineering ADPS Engineering PHYSICAL SCIENCE: 11% of Req Geodetic Science Topography & Photogrammetry Physics Nuclear Physics SOCIAL SCIENCE: 6% of Req Foreign Area Studies	Cost Estimating for Engineers Defense Contract Administration Defense Contract Law Engineer Const Contracting (Field Grade only) Facilities Engineering Mgmt Mapping, Charting, and Geodesy Nuclear and Chem Target Anal	Engineer Staff Officer Topographic Engineer Facilities Engineer Area Engineer Instructor Advisor Recruiting Inspector General
CAPTAIN PHASE UTILIZATION INDEX .82 Professional development thru assignments utilizing level of skills acquired thru Advanced Course Training. A continuous goal will be to afford as many officers as possible opportunity for company command.	ADVANCED COURSE [Alternate specialty qualifying education available thru resident and non-resident instruction.]	UNDERGRADUATE DEGREE PROGRAM DCP (AR 621-1) 18 months or less Service Obligation: Three years for each year in school or portion thereof, but not more than four years.	Service Obligation: Three years for each year in school or portion thereof, but not more than four years.	Mapping, Charting, Geodesy Engineer Equipment Officer Camouflage Atomic Demolition Munitions Special Forces Officer (1Lt and above) Pathfinder Ranger Airborne	Company Commander Engineer Staff Officer Topographic Engineer Facilities Engineer Civil Engineer Pipeline Engineer Instructor Advisor Recruiting Officer
LIEUTENANT PHASE UTILIZATION INDEX .92 Continue development. Acquire basic military engineering knowledge and maximum practical leadership experience.	Basic Course	Period of Study: 18 months Utilization: 3 years Service Obligation: Three years for each year in school or portion thereof, but not more than four years.	*TOP 5% PRGM FOR USMA & ROTC DMG (AR 621-1). *Effective with the class of 1978 the period of study will occur during fourth through tenth year.	Each officer should have an undergraduate degree.	Platoon Leader Company Executive Officer Engineer Staff Officer Topographic Engineer Training Officer

ments as commanders and staff officers in combat engineer battalions. Because of the combat orientation of these units, females are precluded. There are a limited number of positions in this duty field available to females. These are Engineer Staff Officer positions in organizations whose mission is not directly related to combat such as school, training, and research organizations.

Construction Engineer: Officers assigned to these jobs command or assist the commander of an engineer unit engaged in heavy combat engineering. The qualification and training for this duty field are parallel to that of a combat engineer. The difference is that these officers serve in combat heavy engineer battalions, port construction units, pipeline construction units, and other units engaged in heavy engineer construction roles.

Engineer Management Officer: Officers in these jobs command or serve on a staff in an engineer organization engaged in the management of the Army's civil works and military construction programs or in the operations and maintenance of installation facilities. To qualify for jobs in this duty field, an individual must have a bachelors degree in engineering or have equivalent military or civil experience or training.

Topographic Engineer: Officers in these jobs command or assist the commander of an engineer unit or organization engaged in topographic or geographic operations. Officers must have a bachelors degree in an engineering field or in geology, geography, geophysics, photogrammetry, lithography, geodesy, or climatology or have had equivalent practical experience and training.

The Officer Personnel Management System

The Officer Personnel Management System came into being in April 1972. The major objective of this system is to develop officers in the right numbers with the proper skills to satisfy Army requirements at successively higher grades to the grade of colonel. The major feature of the system is *dual* specialty development. This is a step away from the traditional generalist approach to officer development and a step toward specialization in two of the 46 identified Army specialties. The system is a rational approach which manages officers both by rank and by skill on multiple career pathways designed to provide the education and experience needed to meet Army specialty requirements of progressively greater responsibility and authority. Engineer is only one of the 46 Army specialties. All Corps of Engineers officers enter active duty service in the Engineer specialty but later in their career participate in depth in at least one other Army specialty. Officers from

other branches may enter the Engineer specialty at their seventh year of service.

The professional development patterns available to officers in the Engineer specialty are diverse. Figure 1 shows a matrix of the types of duty assignments an officer might obtain as he progresses throughout a career. It is particularly important to note the objectives listed for each of the professional development phases of a career. Further, it is important to understand that an engineer officer does not spend his entire career solely in the engineer specialty.

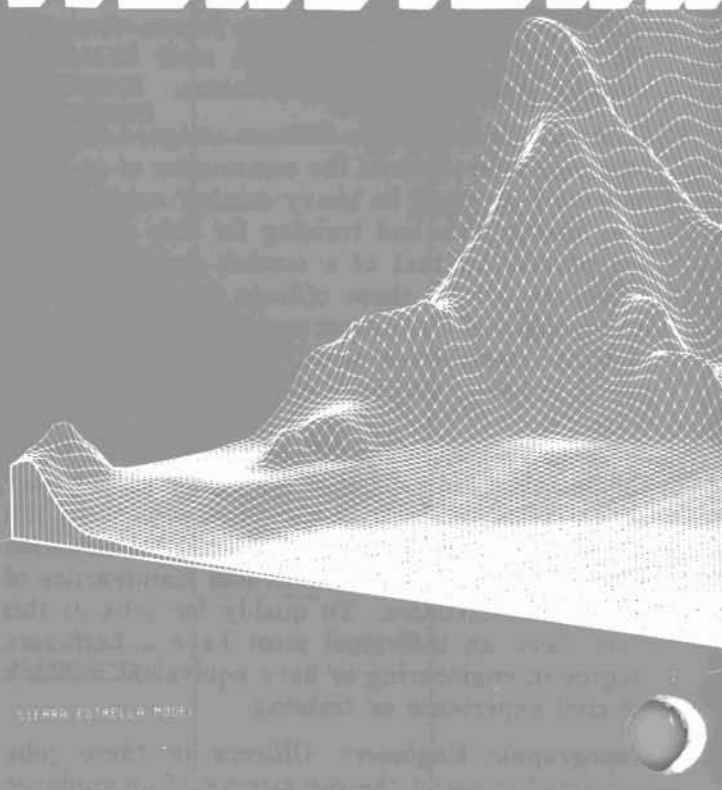
Success as an Army Engineer is primarily a function of an individual officer's ability to acquire and apply knowledge, skills, attitudes, and values related to the duties assigned. Individuals gain these qualities and attributes through study and experience. Some can only be gained by study or other vicarious means. We still believe that the central quality and attribute for success as an Army engineer, in addition to engineer skills, is the *ability to command*. While the ability to command remains a central quality and attribute, *actual command above company level is only one of many pathways to success for Army Engineers.*

Branch vs Specialty

Now that the theory of OPMS has been described, let's discuss the gut questions. Can an Infantryman survive in the Engineer specialty? Is the Corps of Engineers parochial or professional toward engineers in other branches? These are the critical questions that need to be assessed before an individual chooses Engineer as an alternate specialty. The answer is yes, the Corps of Engineers is parochial. We have a proud heritage, but that heritage was achieved through professional soldiering and engineering. But, if you are a professional soldier and have engineer skills, you can succeed no matter what branch brass you wear. All avenues to career success within the Engineer specialty are open. Further, the specialty is understrength, particularly at the grade of major, which makes your chances for success even better. The only questions that remain are: *Do you qualify?* and *Are you willing to accept the challenge?* If the answers are yes, the Engineer specialty needs you. You *can* serve with the United States Army Corps of Engineers. If you are already a member of the Engineer specialty — pass on the word.

LTC Rapp is assigned as Chief of the Plans Branch, Professional Development Division, Officer Personnel Directorate, MILPERCEN. He is a graduate of the Command and General Staff College, holds a masters degree in civil engineering and is a registered professional engineer.

THREE DIMENSIONAL



James R. Jancaitis

Knowledge of the "lay of the land" has long been an obvious necessity for people from many sectors, both public and private. On topographic map sheets, description of the form or shape of the earth's surface is accomplished by the use of contour lines. A contour line is the projection on a map of an imaginary line on the earth, every point of which is at the same elevation. By combining contour lines for numerous, usually equally spaced, elevation values, a two-dimensional representation of the terrain is created by the cartographer. The visualization of terrain from the relief information (contour lines) contained on a standard map sheet, however, has long been recognized as a

problem for large numbers of people who must use these maps in the day-to-day performance of their duties. This difficulty of getting an accurate "mental picture" is due in part to the difficulty encountered by the cartographer in portraying the three-dimensional surface utilizing only lines on a two-dimensional sheet. This approach has been adapted for presentation of terrain relief because it is the only method which allows for the accurate, simultaneous portrayal of both ground elevation and cultural information, correctly registered and scaled. Acquisition of the data required to produce the contour lines is a time consuming and expensive process normally involving high-resolution aerial photography, sophisticated electro-optical equipment and highly skilled personnel.

Some time ago the U.S. Army Engineer Topographic Laboratories (USAETL) at Fort Belvoir, Virginia, pioneered the development of the Universal Automatic Map Compilation Equipment (UNAMACE) which greatly increased the speed with which the basic elevation data can be gathered. One of the products of this equipment (or its predecessors) is a digital terrain model (DTM), a fine, equally spaced grid of terrain elevation measurements. Currently, the DTM is utilized to produce the desired contour lines via

TERRAIN DISPLAY

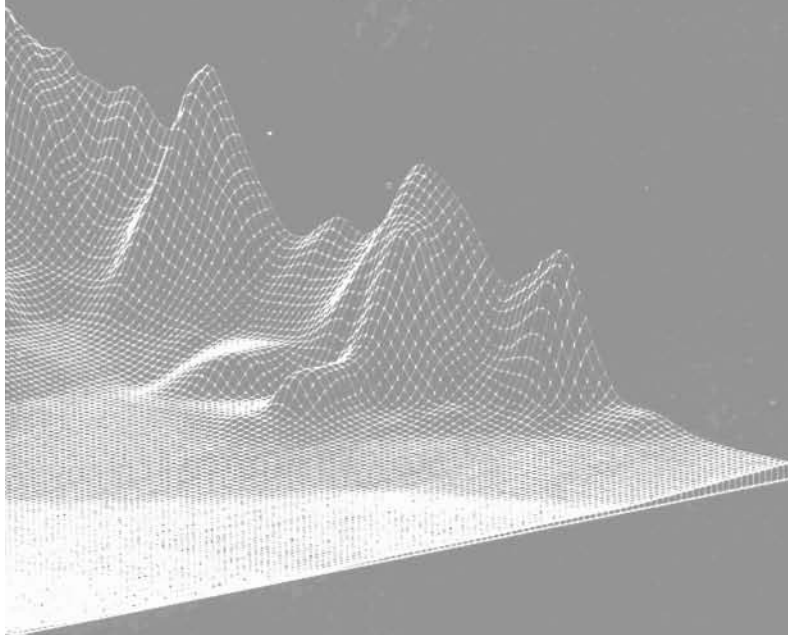


Fig. 1

efficient computer programs. It must be emphasized that the use of UNAMACE, although more cost-effective and efficient than previous equipment and techniques, is still expensive and time consuming. It has long been known, and through background studies USAETL has demonstrated, that a more easily interpretable (though less "measurable") visual display of the terrain, a profile perspective view, can be formed via computer processing when the DTM is available. The profile perspective view of a surface is generated when a rectilinear grid is laid on the surface and then viewed from some convenient vantage point (see fig. 1). The general effect is as though a luminescent fish net has been placed over the terrain and then viewed in the dark. Studies at USAETL have shown that three-dimensional terrain displays such as this can be generated in near real time on cathode ray tubes (television) utilizing minicomputers. Current technology would allow for the storage for immediate access of DTMs covering the area of approximately 1:50,000 map sheets. Development of a prototype system is planned for the coming years. Display sophistications envisioned include the simultaneous and selective display of vegetation, culture, and special purpose information.

Related tasks involving information contained in the DTM that will be concurrently investigated for solution by this system include line-of-sight, trafficability, areas of defilade, and fields-of-fire computations. Expected advances in digital computer storage technology could have a significant and favorable impact on the amount of area coverage available on-line. Using optical-video-digital disc technology, it is feasible to store up to 6,000 three-dimensional terrain maps, at a scale of 1:50,000, on one small (12" diameter) flexible disc. The major problem foreseen for implementation of a field system is the creation of the necessary digital data bases because of the time and expense required.

Mr. James R. Jancaitis is a project engineer at the U.S. Army Engineer Topographic Laboratories (USAETL), Fort Belvoir, VA. Before joining ETL one year ago, he served as a principal investigator on DoD R&D contracts while on the staff of the University of Virginia in Charlottesville, VA. Mr. Jancaitis holds the BS degree from the College of William and Mary and a Master's degree in Engineering from University of Virginia. He has authored 26 technical publications involving 12 technical presentations.



105945



The Medal of Honor MacArthur Almost Won

Sp4 J. Arnold Montgomery

Scores of nations were already trouser-blouser deep in war when the former Army Chief of Staff was recalled from retirement and given command of U.S. Forces in the Far East. The move was intended as a warning to the Japanese—a reminder that America had her big guns in the ready for any nations pondering aggressive actions upon her third-world concerns.

The warning was ignored, and within five months the Japanese attacked at Pearl Harbor. Three weeks later they landed in the Philippines, deploying large forces north and south of Manila. The following three months' actions resulted in the Japanese conquest of the Philippine Islands and a Congressional Medal of Honor for the Far East Commander's valiant defense of the tenuous Bataan Peninsula.

An so, another chapter was written in the legend of the flamboyant patrician-soldier, General Douglas MacArthur. An outspoken and controversial character from his West Point graduation in June 1903 to his dismissal from the U.S. Army in April 1951, MacArthur was lauded and vilified by his critics, blessed and damned by his peers. He was a hero to most who served him; an anathema to commanders who sought to control him.



He was a professional warrior whose credentials included two Purple Hearts, three Distinguished Service Crosses, seven Silver Stars, a Bronze Star, over sixty foreign decorations and, of course, a Congressional Medal of Honor. When his career ended abruptly in 1951, he was the most decorated soldier in the history of the U.S. military.

But there's another chapter in the MacArthur legend few people ever hear about. It's the story of a Medal of Honor MacArthur *almost* received for his role in an espionage mission during the United States occupation of Veracruz, Mexico, in 1914.

Diplomatic relations between the United States and Mexico had been anything but cordial since the assassination of Mexican President Francisco Madero in 1911. Madero was a "good guy" in the eyes of the U.S.; he'd replaced a "bad guy" dictator and showed promise of bringing democracy to Mexico.

But when Madero was shot from under his white hat, he was replaced by another baddie—a callous, reactionary general named Victoriano Huerta. President Wilson didn't care for the new leader, and he showed his displeasure by embargoing all arms shipments to the Huerta regime.

Further, Wilson demanded that all Mexico naval vessels give U.S. Navy vessels a 21-gun salute whenever they spotted an American flag prowling the Veracruz coast.

With understandable indignation, Madero refused. After all, the U.S. ships refused to show that courtesy to the Mexican flag. For a few weeks, the two nations were locked in a stalemate. Then President Wilson took action to resolve the matter—he sent in the military.

One week and 500 casualties later, the U.S. Navy and Marine Corps occupied Veracruz. Huerta retreated to Mexico City and Wilson sent in a brigade of 7000 from the 2d Infantry Division to secure his hold on the port city.

While President Wilson held his breath and prayed for the "little people" of Mexico to arise and overthrow their despotic leader, the War Department made preparations for an expeditionary force to advance on Mexico City. In the event of a war between the two nations, Major General Leonard Wood would command the march on the Mexican capital.

*Mine eyes have seen MacArthur
With a Bible on his knee,
A-typin' out communiques
For guys like you and me.
"Our heavy bombers hit Rabaul
And God is filled with glee!"
While Mac goes marching on.*

—U.S. Navy s

On April 23, 1914, General Wood detailed his aide, a 34-year old engineer branch officer, to prepare for a special intelligence mission "to obtain through reconnaissance and other means consistent with the existing situation, all possible information which would be of value in connection with possible operations." Nine days later, Captain Douglas MacArthur arrived in Veracruz.

Captain MacArthur reported to the commander of the occupying forces, Brigadier General Frederick Funston, and explained his mission. He was under orders from the War Department and would work independently of the general's command.

With over 11,000 of Huerta's regulars surrounding the Veracruz perimeter, the situation was, at best, sticky for the young officer. No amount of explaining or apologizing could prevent a war with Mexico if MacArthur was discovered snooping about the Mexican countryside behind Huerta's lines. On May 3, General Funston wrote in his diary, "Trouble is, we, not being permitted to scout beyond outposts, cannot discover concentration made close there to. If a disaster should result from this condition, I must not be held responsible."

Meanwhile, back in Washington, General Wood

was making plans for a possible attack on Jalapa. The idea was to send Funston's brigade forward and seize the town for an "advance base."

But the rainy season was on and Funston's forces didn't have enough mobility to break Huerta's lines and march on Jalapa—the only feasible approach would be to move the brigade by rail. There were plenty of railroad cars available but, alas, no engines.

Plans for the attack were at a standstill until a captain from the 4th Infantry Regiment struck up a conversation with a drunken engineer from the Mexican railways. The engineer revealed there were quite a few engines in Alvarado, a town 40 miles southwest of Veracruz.

*And while possibly a rumor now,
Some day it will be fact
That the Lord will hear a deep voice say,
"Move over God, it's Mac."*

—U.S. Marine Corps song

Upon hearing news of the precious engines, MacArthur offered the engineer and two of his companions \$150 in gold to lead him to the treasures. The bribe was accepted, and on May 6, the foursome set out for Alvarado by handcar. The trip went smoothly for MacArthur and his compadres; shortly after one o'clock the next morning, they pumped their way into Alvarado.

When they reached the rail yard, MacArthur was pleasantly surprised—three of the five engines they found were in excellent condition. The "meat" of his mission accomplished, MacArthur headed back for Veracruz.

The return trip proved much more eventful, as MacArthur later described in his report to General Wood:

"At Salinas, while moving around the town with one of my men . . . we were halted by five armed men . . . We started to run for it and they opened fire and followed us. We outdistanced all but two and in order to preserve our lives I was obliged to fire upon them. Both went down . . .

At Piedra, under somewhat similar circumstances and in a driving mist, we ran flush into about fifteen men of the same general type. We were among them before I realized and were immediately in the center of a melee. I was knocked down by the rush of horsemen and had three bullets through my clothes, but escaped unscratched. My man was shot in the shoulder but not seriously injured. At least four of the enemy were brought down and the rest fled. After bandaging up my wounded man we proceeded north with all speed available.

Near Laguna we were again encountered and

fired upon by three mounted men who kept up a running fight with the hand car. I did not return this fire. All but one of these men were distanced, but this one man, unusually well mounted, overhauled and passed the car. He sent one bullet through my shirt and two others that hit the car within six inches of me, and I then obliged to bring him down. His horse fell across the front of the car and on the track, and we were obliged to remove the carcass before proceeding."

MacArthur returned to Veracruz unharmed and sent his report to General Wood. The information he gathered on the mission was never relayed to General Funston during the occupation of Veracruz, and the proposed attack on Jalapa never materialized.

In late November of that year, General Wood recommended MacArthur for the Congressional Medal of Honor, citing his former aide for "an amount of enterprise and courage worthy of high commendation."

He was the best soldier the United States produced during World War II.

—Field Marshall Viscount Montgomery

In mid-January, a board of officers from the General Staff was convened to consider the case. On February 9, 1915, the board decided:

"Captain MacArthur's distinguished gallantry in action consisted in making the reconnaissance at the risk of his life. But the board questions the advisability of this enterprise having been undertaken without the knowledge of the commanding general on the ground. . . To bestow the award recommended might encourage any other staff officer, under similar conditions, to ignore the local commander, possibly interfering with the latter's plans with reference to the enemy."

Although MacArthur contested the board's decision, criticizing the officers' "rigid narrowness and lack of imagination," the decision was never reversed.

But this was not the last time MacArthur would be recommended for a Medal of Honor and then refused it. There was also that time on the fields of France during World War I. But then, that's another chapter. . .

Specialist Montgomery is stationed with HHC, 2d Battalion, US Army Engineer School Brigade, Ft. Belvoir, Virginia. He graduated from the Defense Information School in December, 1973, and spent the following two years working for Army newspapers at Ft. Dix, Ft. Ord and the 2d Infantry Division in South Korea.

CONSTRUCTION UNIT

SSGT William S. Herridge

A "can do" attitude often isn't enough to get a military construction job done, as many construction managers learn once the task is begun. How-

ever, project disappointments might be avoided, if a plan devised by a Bryan, Texas-based Army reserve engineer unit, is applied.

The plan, called Construction Unit Evaluation System (CUES), was developed by members of the 420th Engineer Brigade's engineering staff. The plan, the Reservists say, can provide military construction managers with a quantitative measure of an engineer unit's productive capability—

CODE	DESCRIPTOR	TOE SKILLS
1	General	Construction apprentice, painter, lumber stacker, sawmill worker, fork lift op, sawmill yard worker, log scaler, cbt construction sp, cbt demo sp, pioneer, utilities helper, construction helper, lumber jack apprentice.
2	Surveyor	Const surveyor, rodman tapeman, construction survey recorder.
3	Carpenter	Carpenter helper, shipwright.
4	Electrician	Nuclear elec equip op, heavy, cable splicer, heavy cable splicer helper, high voltage lineman, substation elec, substation elec apprentice.
5	Plumber	Heating and vent sp, sheetmetal worker, pipefitter.
6	Mason	
7	Structures Sp	Rigger
8	Refrigeration Sp	
9	Diver	
10	Welder	Welder apprentice, blacksmith, marine welder
11	Pipeline Sp	Pipeline apprentice, pipeline truck driver
12	Marine Engr	Dredge crewman, assistant dredge crewman, crewman, assistant crewman, deckhand, assistant deckhand
13	Lumber Jack	Sawmill crewman, sawmill operator, timber cruiser, lumber grader tallyman, millwright
14	Crane Shovel Op	Hoist op, pile driver op, crane op
15	Loader Op	
16	Tractor Op	
17	Air Compressor Op	
18	Dump Truck (ST)	Heavy veh dr, heavy dump truck dr
19	Concrete Mech Op	Concrete production sp, cement mixer op
20	Grader Op	
21	Crusher Op	Quarry mach op, powderman, quarry wagon op, well driller
22	Ditching Mach Op	Intrenching mach op
23	Asphalt Distr Op	Asphalt production sp, asphalt equip helper, asphalt finisher op
24	Power Roller Op	
25	Water Distr Op	
26	Wash & Screen Op	
27	Nuclear Mech Equip Op	Boiler op, nuclear instrument op, radiation proc control sp
28	Generator Equip Op	Power genr equip helper, generator switchboard op
29	Powerboat Op	Harbor craft op, tender op, drag tender, leverman
30	Rotary Tiller Op	
31	Motor Scraper Op	
35	Indigenous Augmentation — Considered on theater-by-theater basis	

FIG. 1

EVALUATION SYSTEM

an important piece of data when planning a construction project.

CUES, according to its designers, isolates each construction skill, identifies personnel shortages, shows an evaluation of individual skill proficiencies, identifies the number of proficient manhours available per skill and per day, and assigns an overall capability index to the unit as well as to each skill involved.

The 420th engineers, commanded by BG O.D. Butler, had plenty of talent to draw from while devising the system, since most engineers in the unit are either practicing professional engineers or engineering professors at nearby Texas A&M University.

MAJ Rockwood Dunham, from the Office of the Chief of Engineers, provided assistance during the formative stages of the system. He was assisted by MAJ Jerry Selby, an engineer with the State Department of Highways and Public Transporta-

tion and now executive officer with the 871st Engineer Battalion in Austin; LTC Woodrow Free, civilian Staff Training Assistant and the unit's S-3; and MAJ Delton Kittrell, also a highway department engineer and head of the 420th's Engineer Section.

The system depends heavily on codes assigned to each construction skill represented in the construction unit. A study is then made on the proficiency level of each man in each of the 31 skill codes devised by the Reservists. (See Fig. 1)

Total authorized manhours are entered on the CUES worksheet, when manhours available at proficiency levels, or total adjusted manhours, are entered for each skill code.

The skill index, or actual percentage of proficiency for each skill code, is combined for all skill codes to arrive at an average unit index, or proficiency level.

SAMPLE			COMPANY B 871st ENGINEER BN TOE 5-118G																SAMPLE													
AUTH BY MTOE	MANHRS AVAIL FR MTOE AUTH 2	ASSIGNED PERSONNEL AT PROFICIENCY LEVELS IN PERCENT														MANHOURS AVAILABLE AT PROFICIENCY LEVELS IN PERCENT														TOTAL ADJUSTED MANHOURS AVAILABLE	SKILL INDEX	UNIT INDEX
		SHORT OR	0	20	40	60	80	100	120	140	160	20	40	60	80	100	120	140	160													
6	30	1					5								25												25	83%				
18	90	3			2		2	5	4	1	1	4		8	25	24	7	8									76	84%				
12	60	4	1				2	4	1			1			8	20	6										35	58%				
12	60	2						3	3			4				15	18								32	65	108%					
2	10				1			1						2		5											7	70%				
2	10							2								10											10	100%				
4	20	2				2									6												6	30%				
2	10	1						1								5											5	50%				
2	10							2								10											10	100%				
12	60								12							60											60	100%				
2	10											2							16								16	160%				
4	20					1		2			1				3		10		7								20	100%				
8	40	2	1			1	2	1			1		1		3	8	5		7								24	60%				
6	30	2				2		2							6		10										16	53%				
1	5							1								5											5	100%				
2	10							2								10											10	100%				
6	30	6																									0	0%				
8	40		2			2	1	2				1	2		6	4	10		8								30	75%				
109	545																										420		77%			

Although the CUES form, Fig. 1-1, is fairly self-explanatory, a brief discussion of each portion of the table might prove helpful to construction managers wishing to apply the system to their own needs.

Column 1 is a list of construction skills in the unit. The list is determined by the manager, and should represent all construction skills in the unit. However, the list may be limited, for simplification, only to those skills which the manager considers critical.

While column 2 shows the number of men authorized by the Table of Organizational Equipment (TOE), column 3 establishes the number of manhours per skill that would be available at 100 per cent strength.

Column 4 displays the supervisor's own evaluation of the proficiency of each individual, and the number of men at each level in each skill.

Under that portion of the form, subcolumns identify the number of men in each skill who cannot perform at all, or who are just able to accomplish minimal tasks within the skill. At the top end of the evaluation are master craftsmen who can outperform those men rated at 100 per

cent, according to criteria set down in Army publications.

The assigned personnel at proficiency level column displays personnel shortages and the status of individual proficiency—information which indicates requirements for special personnel procurement efforts, training programs training projects and redistribution of personnel within the organization.

Columns 5 and 6 display computed manhours available for each skill. The figures are obtained by multiplying the number of men at a given proficiency level by the productive hours per shift, and by the respective proficiency factor.

The "total adjusted manhours per day available" represents the number of men with a given skill which an organization can mobilize each day.

The skill index, column 7, is obtained by dividing the available adjusted manhours by the manhours authorized by MTOE/TOE, representing the percentage of productive manhours the organization can mobilize based on the manhours authorized.

The unit index, column 8, represents the ability of a unit to complete its construction mission.

CRITICAL PATH METHOD (CPM)

FOR PROJECT PLANNING

PROJECT CB-7(B)-75

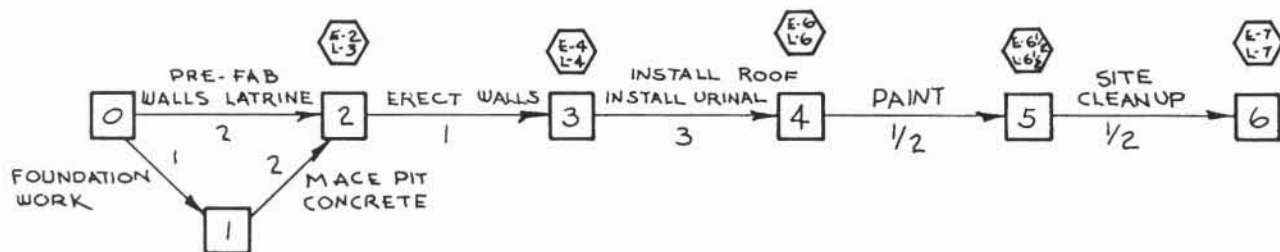


FIG. 1-2

MOS SKILL TAKEOFF

TASK NO	MOS TITLE	MOS. NO.	EST. MH	ACTUAL MH UTILIZED
0-1, 0-2, 1-2 2-3, 3-4, 4-5	CARPENTER	51820	245	
0-2 3-4	PLUMBER	51K20	40	
1-2	MASON	51D20	10	
0-1, 0-2, 1-2 2-3, 3-4, 4-5 5-6	DRIVER	64C20	525	

EQUIPMENT TAKE OFF

TASK NO.	EQUIP. REQ.	NO.	EST. HOURS	ACTUAL MAN-HRS
0-1, 0-2, 1-2 2-3, 3-4, 4-5 5-6	2 1/2 TON TRUCK	1	35	
1-2	CONC. MIXER	1	10	
0-1, 1-2 5-6	5-T DUMP	1	17.5	
0-1 1-2	LOADER	1	15	

The percentage figure is based on the total of the adjusted manhours divided by the authorized manhours, and if used alone, could possibly mask significant strengths or weaknesses in a unit's capability.

Once the CUES report is prepared for a particular unit, only one step in the process of efficient construction management is completed. The CUES figures must then be related to the job at hand, to insure that each individual soldier receives maximum training, and, provided there is enough manpower, equipment hours available to complete the task.

The 420th accomplishes the marriage of input information for useable reliability rates through the use of critical path method (CPM) figures, troop availability reports, and equipment take-off consolidations.

The equipment take-off consolidation table, Figure 1-4, then enables the CUES planner to judge what equipment will be available, and what numbers—also important information when planning the unit's ability to get the job done.

Each estimate is then posted to the Troop Availability sheet by project number, readily showing the estimated MOS utilization for each project, along with the total MOS utilization for the construction unit.

The total estimated hours, compared with the total hours available, provides the unit construction manager and unit commander with a good idea of where he has too many hours of training for his personnel by MOS, and, by the same token, if not enough training has been provided to adequately prepare his personnel in the 31 critical skills.

TROOP AVAILABILITY — ANNUAL TRAINING 1974											FIG. 1-3
COMPANY B 871st ENGR BN UNIT			SAN ANTONIO — TEXAS HOME STATION					CAMP BULLIS, TEXAS AT SITE			
MOS JOB TITLE	MOS NO	NO. ASSIGNED	HR PER DAY CUES	TOTAL HOURS AVBL	MAN HOURS REQUIRED FOR EACH PROJECT (Estimate from CPM)						TOTAL ESTIMATE HOURS
					NO 1-74	NO 2-74	NO 3-74	NO 4-74	NO 5-74	NO 6-74	
Carpenter	51B20	15	76	760	36	120	89	247	138	0	630

The CPM is a graphic means of determining the relationships between tasks associated with any project, as the example in Figure 1-2 demonstrates. Troop availability provides the basis for consolidating the CPM requirements and CUES availability of the 31 skill codes to the construction mission.

The Troop Availability figures, as shown in Figure 1-3, receive Military Occupation Skill codes (MOS) and number assigned to each skill from the

In the example, the estimated hours is 630, while total available hours is 760, showing that the unit lacks 130 hours of carpenter training to satisfy the training needs of the carpenters. The manager, therefore, should request additional carpenter work on the coming project.

The engineers of the 420th are putting CUES to work for them to predetermine the capabilities of the Brigade's 34 subordinate units to accomplish the tasks assigned them.

EQUIPMENT TAKE-OFF CONSOLIDATION

FIG. 1-4

EQUIPMENT NOMENCLATURE	NUMBER ASSIGNED	EQUIPMENT REQUIRED FOR EACH PROJECT					TOTAL ESTIMATED HOURS
		NO 1-74	NO 2-74	NO 3-74	NO 4-74	NO 5-74	
Dozer D-8	4	4	36	80	80	16	216

CUES report, and the hours per day input is taken from the CUES report in the Total Adjusted Man-hours Available column.

Total hours available, therefore, is a simple multiplication of the hours per day times the number of available working days.

Manhours required for each project comes from the CPM as shown in Figure 1-2. This is the estimate made by the project officer/NCO of the hours of training by MOS number that he estimates will be required to complete the project.

While this discussion of the system is not a complete treatment of construction unit evaluation, the information and forms will enable you to put the system to work in your projects, to provide basic unit manpower capability information not normally available to the construction manager.

Staff Sergeant Herridge is an information NCO for the 420th Engineer Brigade, an Army Reserve engineer unit in Bryan, Texas.



Dr. Martin Levy

TEMAWS

The principal thrust of this article is to discuss the Tactical Effectiveness of Minefields in the Anti-Armor Weapons System (TEMAWS) field tests to be conducted at Hunter Liggett Military Reservation from July to December of 1976. However to get a complete understanding of the tests and what will be accomplished, we must first look at the history of landmine development for both conventional and scatterable mines.

History of Conventional Land Mine Warfare

Landmine warfare dates back at least to the time of the Roman Empire. During those times, mine warfare consisted of digging tunnels or mines underneath an enemy's fortification or position. This use of underground or mining operations continued into medieval times. Mining operations assumed a different character with the introduction of explosives; the first use of an explosive mine is recorded in Italy in 1403. This early use of mines to destroy an enemy's defenses was practiced in siege operations up to and during World War I. There "mines" consisted of a powder

charge placed at the end of a tunnel under an enemy fort or position and the charge was detonated by a powder fuse.

It was only a matter of time until the manufactured explosive defense mine, employed above ground, came into being. These early mines were originally called torpedoes, but by about 1860 they became known as mines. With the discovery of electricity, the electric blasting cap was devised to set off the charge. Instead of digging a tunnel to emplace the charge, holes were dug vertically or obliquely into the ground, in rows in front of defensive positions, with a charge placed in each hole. Crude anti-tank mines constructed from artillery shells were put into use soon after tanks appeared on the battlefield in 1916. The anti-tank mines developed in Great Britain, the Soviet Union, and the United States between 1919 and 1939, contained five or six pounds of TNT. The emphasis in post-World War II research has been on explosive damaging mechanisms/capable of penetrating the hulls of heavy tanks, and on fuzes that do not depend on pressure for actuation.



Development of Scatterable Mines

While the improvement of mines continued subsequent to World War II, it was recognized that there was a need to reduce greatly the number of personnel and the time required to install a minefield, to leave areas free of mines until the last moment, to reduce the logistics by mining only where an enemy is or will soon be and to have a standoff capability to deliver mines. In addition, a degree of control over the duration of a minefield was required. To fulfill these requirements, a family of scatterable, self-destructing, light weight anti-tank (AT) and anti-personnel (AP) mines are being developed. Among these are a helicopter delivered AT mine, artillery delivered AT and AP mines, ground vehicle delivered AT and AP mines, Tactical Air (TACAIR) delivered AT and AP mines and quite probably rocket delivered AT and AP mines. [Each mine will have either factory set or field settable self-destruct times. The AT mines will have less than $\frac{1}{3}$ the weight of present conventional mines, they will be dual purpose, that is, can give both a track and a belly kill, and have the capability to be emplaced at a distance from the delivery system, some can be emplaced in enemy held territory and rapid reduced effort is now possible.]

However, because of foreseeable severe dollar constraints it will be necessary to maximize capabilities with reduced resources. The Family of Scatterable Mines (FASCAM) Study looked at this problem mainly using simulation, subjective analysis and some minimum field tests.

FASCAM Study Recommendations

- The employment of scatterable mines should be included in future concepts of operation and doctrine for U.S. forces in both mid-intensity and low-intensity environments.
- Scheduled and future operational tests of scatterable mines should include in the test plans requirements to test and obtain data on detectability of AT scatterable mines under various operational conditions.
- Normal minefield densities of .001 mines per square meter should be recommended initially. Current doctrine on minefield depth appears to be adequate. However, doctrine should provide the option of sowing scatterable mines in belts.
- Scatterable mines should normally be employed in accordance with current doctrine which states that minefields should be covered by fire and surveillance.
- All U.S. Army doctrine should stress any measures which will force the enemy to close hatches or armored vehicles and thus enhance the effectiveness of our scatterable minefields.

Purpose of TEMAWS

It was determined that certain field tests would be required in order to react to the above recommendations. Therefore the TEMAWS field tests were proposed. The main purpose of the test is to provide data to the US Army Engineer School which will assist in the evaluation of the impact of scatterable minefield density (mines per square meter), patterns, detectability and synergism on anti-armor warfare doctrine and the logistics involved.



Objectives of the TEMAWS Test

In order to fulfill the purpose of TEMAWS, the following objectives must be accomplished. The test will:

- evaluate various densities of scatterable mines against a mechanized threat.

- evaluate the visual detectability of scatterable mines.
- compare the effectiveness of one continuous minefield versus several strips (belts) of mines using scatterable mines.
- evaluate the synergistic effect of minefields in the anti-armor weapons system.
- evaluate various densities of conventional mines against a mechanized threat.

Scope and Tactical Context

The five part experiment will be a two-sided, near real time loss assessment experiment to obtain comparative data on the effectiveness of minefields. Data will include time, position, engagement histories, and exchange ratios. A requirement for 54 experimentation days for execution of 108 trials and 16 experimentation days for exploratory trials is anticipated. A typical trial will consist of an engagement between a defending mechanized unit, consisting of approximately 5 APC mounted TOWs and DRAGONS supported by minefields, against an attacking threat armor unit consisting of up to 25 tanks and ATGM systems. The enemy forces will be determined by the US Army Intelligence Threat Analysis Detachment (ITAD) and by the U.S. Army Combat Development Experimentation Command (CDEC). Computer simulations will be run by CDEC to determine the size and structure of the defending forces which will provide credible results without giving either side an undue advantage. Indirect fire support will be simulated. The two-sided experiment will provide realistic stress and distraction and a means for quantifying the synergistic effect of minefields. Comparative data will be obtained using three threat tactics and four minefield densities including baseline trials using zero density.

Part 1 will be conducted using the most likely threat tactic against heavy, light, and zero density scatterable minefields. The resulting data will be analyzed immediately to assist in determining the minimum credible minefield density. Part 2 will be conducted using two different threat tactics against heavy, light, and minimum credible density scatterable minefields. Part 3 will be conducted using two different threat tactics against the minimum credible density scatterable minefield configured in three belts. Part 4, if played, will be conducted using two different threat tactics against light, medium, and heavy density conventional minefields. Part 5 will be with a credible density minefield but without covering fire.

Statistical Analysis

Appropriate statistical analyses will be made to:

- Determine the required number of trials for each part above.
- Determine the capability to detect and avoid scatterable mines.
- Determine the density to be used for a credible minefield of minimum density.

Scatterable Mine Simulator (SMS) System Characteristics

TEMAWS will be using a Scatterable Mine Simulator which is different from any mine simulator used previously. The major difference is that the SMS system will be made up of a receiver on the armored vehicle, and a radio transmitter in the mine simulator which continuously transmits on a given frequency. A mine "detonation" occurs when a vehicle passes over a mine so that the antenna on the vehicle picks up the very low power transmission from the "mine" transmitter. In general, the SMS System will be made up of three component groups:

- The mine simulator consisting of the transmitter, the housing and the power supply.
- The detector consisting of the receiver, the antenna system, the power supply, the housing, the mounting brackets and cables, and the interface unit.
- The test and checkout equipment consisting of the receiver test set and the transmitter test set which will also act as a mine simulator detector.

Conclusion

Successful TEMAWS tests will:

- Contribute to the data base available for future anti-armor weapon system evaluation. This data base will include densities, detectability and patterns.
- Show the capabilities of low density scatterable minefields.
- Develop values for the enhancement of direct fire weapons due to the presence of mines.

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The New Bridges - - Where Are They?



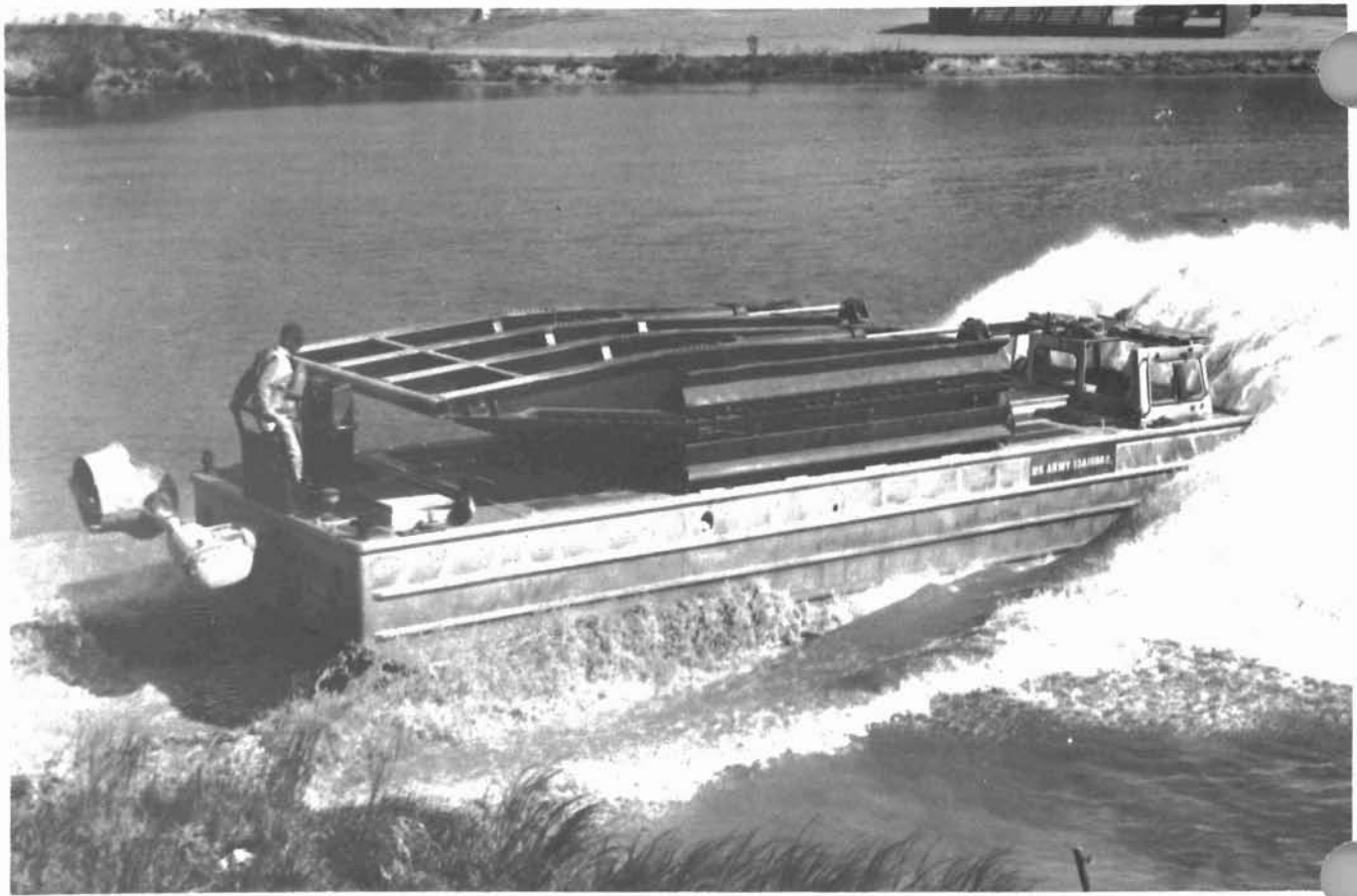
Harold A. Dotterer

The last four years have seen more accomplished toward improving our tactical bridging capabilities than during any other period since WW II. The payoff, in terms of new equipment in the field, should reach its peak during the next six to nine months. Following is a rundown of bridging equipment to look for:

The Mobile Floating Assault Bridge (MAB) is not new. It has been in the field in limited quantities since 1968. However, the MAB has been improved and many of the new welded hull models have been bought so that by July of this year three times as many MABs will be in the field. They will be more common in Europe than anywhere else but some CONUS units, particularly Armor and Mech Infantry divisional engineer battalions, will be reequipped with this modern float bridge that can be assembled as a bridge or ferry at the rate of approximately twenty feet per minute.

The Ribbon Bridge is new. It is a bridge

system consisting of interior and ramp bays that are transported, launched and retrieved by a modified 5-ton bridge truck. Bays, carried in folded position, automatically open upon entering the water. Then, with the aid of bridge erection boats, they are joined together to form bridges or ferries at rates of 10 or more feet per minute. Made of aluminum alloy, the bridge can support 60-ton loads in currents up to 8 feet per second and 80 tons when conditions are ideal. The system also includes boat launching cradles which enable us to transport and launch an assembled 27 foot bridge erection boat in about three minutes from the same modified 5-ton bridge truck. The system was developed by the Mobility Equipment Research and Development Command (MERADCOM) and in June 1972 was officially designated the standard float bridge to replace the M4T6 and Class 60 float bridges now in the field. The initial production contract with Consolidated Diesel-Electric has now produced sufficient units to start equipping the units in the field. The first units went to the



US Army Engineer School at Fort Belvoir; the US Army Training Center, Engineer at Fort Leonard Wood; and the 2d Engineer Battalion, Korea, in February 1976. Subsequent shipments are destined for Europe, CONUS, and wherever float bridge units are located that have not been re-equipped with the MAB.

Soon after we had developed the Ribbon Bridge, engineer field commanders advised the combat and materiel developers of need to retain most of the cargo hauling capability that we now have with the 5-ton stake trucks organic to conventional float bridge units. Since the Ribbon Bridge transporter, by itself, has virtually no cargo hauling capability, a cargo pallet was developed which can transform the transporter into a flat bed cargo hauling vehicle. *The Ribbon Bridge Transporter Cargo Pallet* permits the modified 5-ton bridge truck to carry up to its rated load of general cargo. After off-loading the bridge bay, the transporter launching and retrieving mechanism is used to load an empty pallet, or one loaded with up to 8,500 lbs of cargo. These pallets will be issued as operational project stock to those theater commanders whose plans require that their float bridge companies have a secondary mission to haul general cargo. Initial production quantities of the pallet will be available along with the first increment of the bridge system destined for Europe.

There is still more to be done to meet the short range objectives for improving our bridging capabilities. For example, MERADCOM is working against a DA approved requirement to provide a new bridge erection boat that will be fully compatible with the Ribbon Bridge. This *Ribbon Bridge Erection Boat* will have essentially the same power (thrust) as our current two-piece, 27 foot boat, but its draft will be reduced to about 25 inches. The new boat will have a one-piece hull that will fit onto the Ribbon Bridge transporter which will carry the boat to the edge of the stream and launch it in two to three minutes. The current development schedule calls for the first of these boats to arrive in the field before the end of FY 78.

Another example of things soon to come is the United Kingdom's *Medium Girder Bridge (MGB)*. After testing this bridge in the US, it was adopted in February 1973 as standard US equipment to take its place along with the Bailey Bridge to satisfy our dry support bridge requirements. The MGB will enable one platoon from the bridge company to erect a Class 60 bridge, 100 feet in length, in approximately one and one-half hours. No assistance will be required from a combat engineer company as is the case with the Bailey Bridge. A contract for the initial production quantity has been awarded to Fairey Engineering,

Limited, and the first units should be in the field before the end of FY 77.

Two other developments related to the MGB are also in progress. They are the US developed *MGB Cable Reinforcement Set* and the standard UK *MGB Pier and Span Junction Sets*. Each is a candidate for selection as the US standard method of extending the MGB Class 60 capability from 100 to 160 feet. After they have both been tested, the most cost effective method will be selected and fielded. The Span Junction Set deserves additional consideration because it would provide a capability for erecting multiple span MGBs over existing or expedient piers. Testing is now in progress.

Even as development of these bridge programs near completion and new equipment is being fielded, the R&D community has started working to meet the more stringent demands projected for bridges in 1985 and beyond.

Never to our knowledge has there been a better foundation for starting an advanced development program than has been established for future bridging development. This foundation was laid by an International Concepts Study Team (ICST) whose members included representatives from the Federal Republic of Germany, the United Kingdom, and the United States. The ICST spent 2½ years in a dedicated effort to develop a concept worthy of the R&D effort required to transform the concept into hardware.

Briefly, the concept depicts a family of bridges with a maximum commonality of major components which can be mechanically launched by a small crew. This family of crew launched bridges would be employed in all tactical bridge roles, i.e. assault, dry support, and wet support.

Currently MERADCOM is engaged in the engineering effort required to thoroughly evaluate the concept while a joint USAES/MERADCOM draft of the Letter of Agreement for the "Investigation of a System of Bridges for 1985 and Beyond" is moving up the chain to DA for approval.

Mr. Dotterer is a Combat Development Materiel Analyst with the Materiel Systems Division, Deputy Commandant for Combat and Training Developments, US Army Engineer School (USAES). Associated with the Corps of Engineers since 1943, his previous assignments have included duties as Combat Engineer Platoon Sergeant during WW II, Engineer Commander in Korea, Theater Map Distribution Officer in USAREUR, Instructor Engineer Officers Career Course, USAES, Staff Officer (S4), 1st Engineer Combat Battalion, and Project Officer in the Doctrine Division, Office of Doctrine and Training Developments, USAES.

CCE: Update



Engineer Staff

The M870 40T semi-trailer in combination with the M123 10T tractor will carry the D8K dozer without overloading either the tractor or the semi-trailer if the D8K is loaded with the blade resting on the gooseneck and with 8 to 12 inches clearance between the front of the track and the gooseneck.

An analysis by the US Army Mobility Equipment Research and Development Center indicates that this method of loading puts a load of 59,000 to 60,000 pounds on the trailer rear axle group and 38,600 to 39,600 pounds on the M123 king pin.

These axle loads are in excess of some states' legal limits. For the proposed long term solution to this problem see the CCE update.

Commercial Construction Equipment (CCE) continues to make its way to the field at an ever-increasing pace.

In November of 1975, the new utility tractor with backhoe and loader (John Deere Model JD-410) began arriving in engineer units. The utility tractor provides a much needed, versatile capability for performing excavating, entrenching and back filling operations.

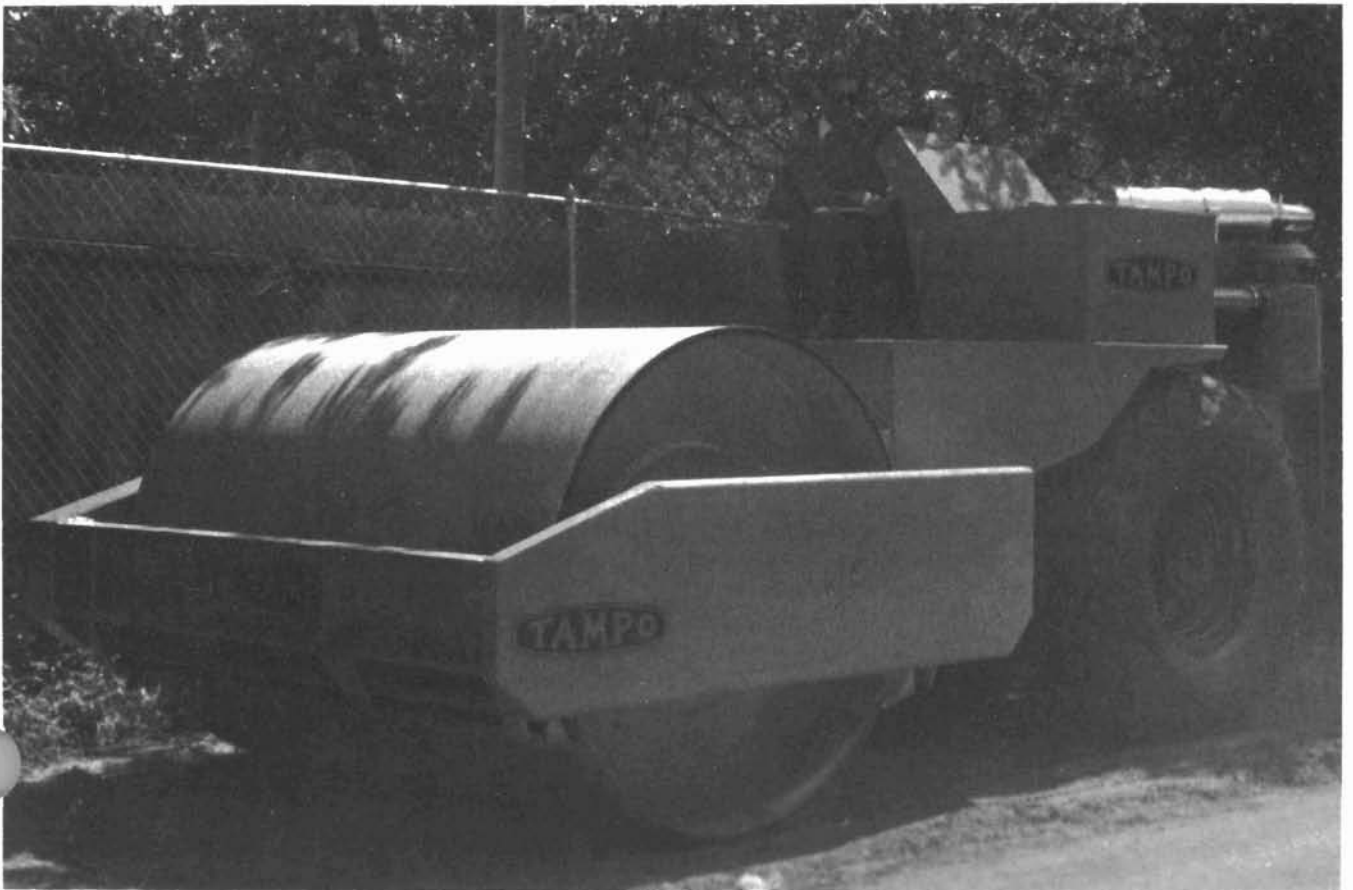
Two new items of compaction equipment are being introduced in the last half of FY 76. Shipment of the new high-speed tamping foot compac-

tor (Koehring Model K-330) began in January, and the new self-propelled vibratory roller (Tampo Model RS-28) is scheduled to begin arriving in the field in June. Also in the compaction area, the gasoline-engine driven hand tamper (Stone Model VR-11) will make its debut in July. With the introduction of a new self-propelled pneumatic roller later in the year, the entire Army fleet of compaction equipment will complete a much-needed upgrading.

In a related area that should spark considerable interest among the maintenance and logistics types, specifications are currently being written to procure a common Engineer Truck Chassis for the 20 ton dump truck, the new 8 cubic yard concrete mobile and the prime mover for the CCE 40 ton semi-trailer. Higher densities in individual units and greater commonality of major components are the goals for this program.

Finally, in early February a coordination conference was held to complete agreement on the specifications for a 750 CFM air compressor that will replace the current 600 CFM used in rock drilling operations.

More items are scheduled for contracting in FY 77 and we'll keep you posted on what happens as events evolve.



Evaluation for the UET



IT EVEN SWIMS — This universal engineer tractor (UET) recently underwent testing and evaluation by Headquarters, MASSTER (Modern Army Selected Systems Test, Evaluation and Review). In addition to its swimming capability, the UET can also travel cross country. The UET could in the future provide the combat engineer with the mobility required to keep pace with armored and mechanized units on the move.

SP4 Linda St. Pierre

Often during the conduct of war, maneuver units encounter natural and man-made barriers which may delay their advance and expose them to intense enemy bombardment. Removing such barriers is the responsibility of combat engineers who must be readily available to accomplish their mission to enable the infantry and armor to regain the momentum of the attack.

Within the engineer community, there is a requirement for multi-purpose equipment to provide the degree of mobility required to keep pace with fast moving armor, mechanized infantry and

airborne thrusts.

In order to help satisfy this requirement, user tests were recently conducted at Fort Hood. Headquarters, MASSTER (Modern Army Selected Systems Test, Evaluation and Review) evaluated a Universal Engineer Tractor (UET) as a possible answer to the necessity of responsive support for the maneuver arms.

The user evaluation test was designed to obtain information as to the operational feasibility, user acceptance and potential operational advantages of the UET. Objectives of the test were to

evaluate the utility of the UET, provide information of the ability of the UET to perform assigned tasks in an operational environment and to obtain data as to the reliability, availability, maintainability and performance characteristics of the UET. During the test period of October 6 to December 12, the opinions of operators, supervisors and battalion officers were solicited and evaluated.

MASSTER evaluated two of the four existing UETs while one was undergoing tests by Test and Evaluation Command (TECOM) at Aberdeen Proving Grounds, Maryland, and the fourth remained with the contractor.

Primarily the UET is a bulldozer and scraper but has other capabilities. It can be used as a prime mover, rough grader, cargo carrier and jumper.

The 32,000-pound UET can reach a top speed of 30 miles per hour and can carry up to eight cubic yards of material. When employed in the transport mode, the UET can carry over 200 cubic feet of cargo, and is capable of self-loading palletized loads.

Somewhat similar in shape to the armored personnel carrier (APC) the UET is eight feet high, nine feet wide and 24 feet long, four feet longer than the APC. The UET is lighter than the D7F dozer which weighs approximately 48,000 pounds. The scraper bowl of the UET can be ballasted with soil to increase the UET gross vehicle weight to 54,000 pounds.

In moving, the UET uses a steering wheel system rather than the usual levers employed on other tracked vehicles.

The biggest advantage the UET has over current earth movers is its capability of traveling over rough terrain. With this cross-country capability, the UET enables the combat engineers to keep up with armored and mechanized troops.

The UET also has a limited swimming capability comparable to the APC and utilizes a bilge pump system like that of the APC to discharge the water taken on through unsealed metal junctions.

From the data collected during the test period, operators of the UET seemed to like the added mobility of the UET and the additional capabilities that the UET has, such as swimming.

The 8th Engineer Battalion, 1st Cavalry Division used the UET during the month of October for building barricades, tank traps, digging APC emplacements and constructing a rough pioneer road. The 17th Engineer Battalion, 2nd Armored Division used the UET during November to perform range maintenance on roads and to work on enlarging the division's high-pressure wash racks.

The original concept of the UET was first formulated in 1958 when the Mobility Equipment Research and Development Center (MERDC), Ft. Belvoir, Virginia, initiated development effort for a universal tractor. The initial concept was for a rubber-tired, ballastable airborne tractor to fulfill the needs of airborne engineer units. Industry was asked to submit proposals for such a tractor, and an alternate proposal for a ballastable, scraper-dozer tractor was accepted by the developer. Approval of military characteristics for a UET was obtained in 1960. The basic requirement for the UET was under constant revision until 1965.

Since late 1964, the UET underwent extensive engineering and service testing by TECOM. These tests indicated that the UET failed to meet reliability, durability and maintenance requirements but did perform its earthmoving and hauling functions in an outstanding manner. The present development program consists of an Advanced Production Engineering contract to improve these tractor components which failed and the fabrication of four UETs for government evaluation. The four UETs which were developed underwent contractor testing during the past summer, and MASSTER was tasked by the Army Material Command to test two of the UETs.

Use of the UET by the combat engineer in the future would not only provide him with equipment with various capabilities, but would allow the combat engineer to keep up with mechanized and armored units on the move. The UET's mobility, especially to travel over rough terrain, will enable the combat engineer to remain with the maneuver units.

Specialist Fourth Class Linda St. Pierre is an information specialist at Headquarters, MAS-TER, Ft. Hood, Texas



MAJ Joel M. Cain

Ask a group of U.S. Army Corps of Engineers officers where topographic engineers receive their training and watch their reaction. After a few moments, most would say the Mapping, Charting and Geodesy Officer's Course at Ft. Belvoir, Virginia. The more senior officers would say through a civilian graduate program, and perhaps one in a hundred would mention the School of Military Survey in England. The Army Survey Course at the School of Military Survey is a professional development advanced course for Royal Engineers Officers who have been selected for the Royal Engineer Survey Service. The School is under the technical direction of the Director of Military Survey and organized into Departments of Field Survey, Air Survey, and Cartography with each department headed by a chief instructor. An interesting approach to teaching is used; rather than teach a number of subjects concurrently, a single subject is mastered at a time. The student is

taught by the same instructor for periods of two to nine weeks.

Candidates for the course are carefully selected. A maximum of 18 students can be accepted for each course. Officers of the Royal Engineers, probationers of the Directorate of Overseas Surveys, and officers and civilians of Commonwealth and foreign military (including the U.S.A.) are eligible.

The methods of instruction are lectures and tutorials consolidated by practical exercises. Many of the practical exercises provide continuity between subject areas; for example, positions defined in the field surveying are used to control air survey projects. The course is divided into Basic and Advanced parts. At the end of the Basic part, a practical task (trial survey) is used to consolidate in the field all techniques learned in the previous eight months. The trial survey is a one-month individual task, resulting in each stu-

dent producing an original large scale (1:2,500) survey and a drawn contoured map of the survey site. Tests are given throughout the course to assess the student's progress and as instructional tools. Although graded, these tests are considered course work and not examinations. Written comprehensive examinations are taken after the Basic and Advanced parts of the course and consist of seven three-hour papers. To pass the course, the student must successfully pass every test with a minimum score of 40 and an overall average of 50. Professional qualifications and credentials may be obtained by successfully completing the course. A pass in Parts I and II of the course exempts students from the Royal Institute of Chartered Surveyors professional written examination. The duration of the course is 53 weeks, with two courses running concurrently, one starting in the spring and the other in the fall. Subjects covered in the course are:

Subject	Approx. Duration
Basic field surveying	9 weeks
Basic field astronomy	3 weeks
Field observations for major control	2½ weeks
Cadastral surveys, land registration large-scale topographic surveying techniques	7 weeks
Basic air survey	4 weeks
Cartography and map reproduction	5 weeks
Trial survey	5 weeks
Advanced survey	7 weeks
Advanced air survey	5 weeks
Leave and holidays	4½ weeks
Examinations	1 week
	<u>53 weeks</u>

The School is not all academics. There is also extensive social activity. The students are provided quarters and are integrated into the British military and civilian community. The small classes are ideal for developing deep and lasting friendships between students. The large percentage of allies creates an international environment where numerous customs, traditions and attitudes are assimilated. Organized social functions include monthly Dining-Ins, the Survey Summer Ball, and the Engineer Ball. Foreign students also have the opportunity, as exchange officers, to participate in their own Embassy functions.

Seventeen U.S. Army Corps of Engineers officers have attended the Army Survey Course since 1961. The course provides officers with the "hands on" experience that is not provided in our civilian Advanced Degree Programs. Since 1970, graduates of S.M.S. have combined the Army Survey Course with a consecutive assignment to graduate school. They are given up to 9 credit hours for the course at S.M.S. and may be able to qualify for a Master of Science Degree in geodesy or photogrammetry with as little as one additional year of advanced training.

Officers interested in taking the Army Survey Course can apply to the Engineer Branch, MILPERCEN. In addition, short courses are offered for U.S. personnel in land navigation and astronomic position fixing. These courses have been primarily attended by Special Forces Units, but engineer units stationed in Europe can inquire as to availability of these courses by writing to Directorate of Military Survey, Ministry of Defense.

A graduate of the British School of Military Survey, MAJ Cain started his career in the U.S. Air Force before transferring to the Army Corps of Engineers. After receiving a Bachelor of Science degree in Geodetic Science from Ohio State University, his first assignment upon commissioning was to Detachment 3, 1381st Geodetic Survey Squadron, Grand Forks A.F.B., North Dakota, where he served as Operations Officer and Detachment Commander. His Army assignments have included: the Engineer Officer Basic Course; Airborne training; S-1, 326th Engineer Battalion; Commander, 66th Engineer Company (TOPO) (CORPS) in Viet Nam, and attendance to the Army Survey Course. MAJ Cain received his Masters Degree in Geodesy and Photogrammetry at Iowa State University. He was an Exchange Officer with the Mapping and Charting Establishment (Royal Engineers) prior to attending the Engineer Officers Advanced Course in 1973-1974. CPT Cain is currently an instructor at the Military Intelligence School, Ft. Huachuca, Arizona.

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SUMMER 1976 TURBULENCE IN OPD

There will be a major turnover in the near future of the Engineer officers currently assigned to OPD. An asterisk appears beside the name of those officers who are departing. The replacement, if known, is indicated in parenthesis.

Colonels Division: (DAPC-OPC-AE)

Engineer Assignments, LTC Tom Sands, 325-7871

LTC Division: (DAPC-OPL-AS)

Engineer Assignments, LTC Henry Covington, 325-0423

Majors Division: (DAPC-OPM-AS)

*Engineer Assignments, MAJ Ted G. Stroup, 325-8109
(MAJ Gary E. Woodham)

Combat Support Arms Division: (DAPC-OPF-E)

*Division Chief COL Carl P. Rodolph 325-0628

*Engineer Branch Chief LTC Charles E. Eastburn 325-7434

CPT Assignments

*LT Assignments MAJ James E. Corbin 325-0650

CPT Milton Hunter 325-0

(CPT Michael R. Foster)

*Professional Development MAJ Martin Suydam 325-7426

*Personnel Actions LTC Leslie H. Savage 325-0621

(MAJ Roger Yankoupe)

Warrant Officers Officers Divisions: (DAPC-OPW-AU)

Engineer Assignments CW4 Jean L. Derby 325-7837

Professional Development Division: (DAPC-OPP-P)

*Engineer Specialty Monitor LTC Edward Rapp 325-8152

(MAJ Tom Ostenberg)

*Chief, Plans Branch LTC Edward Rapp 325-8152

(MAJ Galen Yanagihara)

TOPOGRAPHIC ENGINEERING

The following chart displays a breakdown by grade of Army Engineer Topographic officers from colonel through warrant officer. The officer assets include those who have received graduate training in a Topographic discipline and those officers who have received other training by serving in Topographic positions and in some cases, attending other Topographic schools. The requirements figures are developed from the most recent data available.

Army Topographic Officer/Assets

Type of Training	COL	LTC	MAJ	CPT	LT	WO
Graduate Training	6	35	30	10	1	1
Other Training	17	38	22	65	25	
Total	23	73	52	75	26	
Requirements	9	27	21	26	18	38
Asset/Requirements (A/R)	2.5	2.7	2.4	2.9	2.0	2.0

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The A/R ratio of 2.4 to 1 and greater for field grade officers is sufficient to meet normal requirements. Company grade officer positions are normally filled by personnel serving their first or second tour in the Topo field.

The following table reflects our Topographic Training forecast (fully funded civil schooling in support of Topographic AERB positions).

**Topographic Training Forecast
(Graduate Schooling)**

Discipline	Initial AERB Positions	School Input	FY 74	FY 75	FY 76	FY 77
Geodetic Science	8	5	3		1	3
Topography & Photogrammetry	4	2	2		1	1
Geological Science	2	0	1		0	0
Geography	1	0	0		0	0
Totals	15	7	6		2	4

AVIATION AS AN ALTERNATE SPECIALTY

As a result of recommendations made in a detailed ODCSPER study of the Army's Aviation Management System, the addition of aviation to the list of specialties under OPMS has been approved.

The new aviation specialty concept is keyed to meeting field grade aviator requirements. Its main features include the following:

- Aviation is an advanced entry specialty to be designated in an officer's eighth year of service. Aviators will be trained and assigned based upon their basic entry specialty.

- In the future, only officers from Infantry, Armor, Field Artillery, Air Defense Artillery, Engineer, Signal Corps, Transportation Corps, and Military Intelligence branches may receive flight training.

- Officers enter flight school between completion of their BR OBC and one year of troop duty and their 60th month of commissioned service, except for those in the Aviation Materiel Management specialty who will attend upon completion of the Transportation Officer Basic Course.

- One of the primary concerns in developing the Aviation specialty is to insure that it is supportive of the present role of Army Aviation. The Army Aviation Program must continue to attract motivated, highly qualified officers who are well grounded in the combat and combat support arms. These officers must be provided with a career experience that will allow them to make a professional contribution in command and staff assignments at every level of the Army. Therefore, these criteria will apply to selecting officers for the Aviation specialty:

- Army requirements.

- Manner of performance in aviation command and staff positions.

- Potential for future development in aviation assignments.

- Year Group strength requirements.

- Utilization standards (Aviation Career Incentive Act).

The designation plans closely parallel those with a YG prior to 69 used to designate all other OPMS specialties. Once the records of all aviators have been reviewed based on known Army requirements and the officer's experience to date, OPD's career divisions will determine the OPMS specialty combination tentatively considered most appropriate for future designation. During March 1976, each aviator will be apprised by letter of these tentative designations and will be asked to cite a preference for other appropriate designations. All factors will be considered by a board of officers to determine final designations. By 30 June 1976, commissioned aviators will be informed of the two specialties in which the board decides they should expect future management.

Once redesignated into the aviation specialty, officers will be managed primarily in aviation and

ENGINEER

one other OPMS specialty. Those officers not selected by the board for redesignation will continue to be managed in their currently identified specialties.

All aviators — including those involuntarily precluded from having aviation as one of their OPMS specialties — will be entitled to continuous incentive flight pay for the first 12 years of aviation service provided they maintain Class 2 physical standards and complete the annual written examination. Although commissioned aviators cannot be guaranteed of making the Aviation Career Incentive Act pay gates, and thus receiving monthly flight pay beyond their twelfth year of aviation service, those redesignated into the aviation specialty will have the greatest opportunity to meet the gates, since they will receive intensive management into positions requiring qualified commissioned aviators.

STABILIZATION

The Officer Corps currently is enjoying the greatest amount of stability on station since the post Vietnam environment. Decreased "non-dependent tours (NDT)" requirements, escalating moving costs, lack of PCS funds, etc., all have impacted to provide more time on station for military personnel and dependents. Current DA Conus stability policy is 36 months on station. Exceptions to this are primarily in the schooling area — both, military and civil. Overseas tours remain at 39 months for accompanied long tours and 13 months for non-dependent tours.

HOMEBASING/SEQUENTIAL ASSIGNMENT

Effective 15 January 1976, OPD began implementation of a Sequential Assignment Policy for all officers selected for 12/13 month NDT. This policy requires that all officers being considered for a NDT be informed of their sequential (follow-up) assignment prior to their departure for overseas. This DOD policy was developed to reduce PCS expenditures associated with the displacement of family dependents concurrent with a PCS to and from a NDT area. Hopefully, the family would elect to remain at their current location or to proceed in advance of the officer to the vicinity of his new duty station, thereby saving one dependent PCS relocation cost. As a separate but related issue, the ODCSPER is exploring the feasibility of the officer's family occupying government quarters during his absence, either at the losing or the gaining installation. Implementation of this policy is requiring an extraordinary amount of coordination, however, it will be several months before we will be able to assess its impact. An individual being placed against a NDT requirement can elect not to participate in this DOD program.

MAJORS ASSIGNMENTS

Although Major nondependent tours are somewhat limited, overseas vulnerability currently is defined as those officers who have two or less NDTs and have been stationed in CONUS since 1968-69. Vulnerability for accompanied overseas tours will go to those having 36 months or more in CONUS.

It has become increasingly important that Majors think of qualification in their alternate specialties. They should look at this in terms of duty assignments, military schooling, and civil schooling.

The field can expect to see arriving on the scene other officers from different primary specialties beginning to serve in their alternate specialty of 21.

With the new CGSC selection procedures, i.e., DA Board, it would appear that we did well with the number of 04s selected. However, this is an aberration since we had so many last year eligible (LYE).

The CGSC military education level continues to be important for assignment actions. continue to recommend non-resident CGSC for those officers in their waning years of eligibility who have not attended the Resident Course.

Majors should seriously consider changing jobs at least once during a normal 36 month tour to

POTPOURRI

demonstrate their versatility. PCS constraints prevent the frequent movement of personnel strictly for professional development.

CAPTAINS ASSIGNMENTS

Overseas: Long tour assignments are available in decreasing frequency to: USAREUR, Hawaii, Alaska, Canal Zone, Middle East, Mediterranean and the Far East. Most overseas requirements will be filled by volunteers. Officers having no nondependent tours or those who have had only one NDT and who have been in CONUS for 4 to 5 years are vulnerable for another NDT.

CONUS: Captains eligible for CONUS assignments are reviewed for assignment approximately 5-6 months in advance of the required reporting dates. Currently, Captains can expect to serve 36 months on station in CONUS, excluding schooling assignments. USAREUR tours are now at 39 months.

Assignments will be available in OCE activities, Facilities Engineering, and AMC for qualified officers. Those officers completing graduate level civil schooling can anticipate an OCE, TOE/TDA staff, Facilities Engineering, ROTC, or Service School utilization assignment.

EOAC: Engineer Officers Advance Course (EOAC) will be programmed into an officer's assignment pattern as a normal PCS move. Captains and Lieutenants in long tour areas or CONUS may be curtailed up to 6 months for EOAC. Those qualified Captains who have not been to EOAC will be selected for attendance upon completion of 36 months on station contingent upon individual desires and current eligibility criteria. Since EOAC has been reoriented to prepare company grade officers for command, Engineer officers can expect to attend the Advanced Course between 3-6 commissioned years of service. Fort Belvoir conducts three courses of 26 weeks duration per year. Officers who are interested in attending either the Infantry or Armor Officer Advanced Course should make their interest known to their assignment officer.

LIEUTENANT ASSIGNMENTS

Assignment stability dictates CONUS tours of 36 months on station prior to consideration of a PCS. Overseas tours range from short tours of 13 months to long tours of 39 months.

EOAC (Engineer Officer Advanced Course) is generally the next step after initial CONUS or Overseas (long) tour. Eligibility criteria remains the same: Good performance with troops and availability. Selections are made on a competitive basis. Attendees, to-date, have been in the primary zone-of-consideration for promotion to Captain, AUS.

WARRANT OFFICER ASSIGNMENTS

Procurement is still open for Engineer Equipment Repair Technicians. Twenty-four appointments have been made this FY with Approximately twenty-five more authorized. Authorized FY 76 end strength is projected to be 255.

The Managed Tenure Program replaced Long Range Active Duty for retention of other than RA Warrant Officers with over 20 years active federal service. The DA Active Duty Board recently considered for retention those Warrant Officers with retirement eligibility in FY 7-T, 77, 78. Selections by MOS are as follows:

351A-1	811A-0
521A-5	821A-0
621A-23	833A-0

Integration into the Regular Army is the only alternative to Managed Tenure for Warrant Officers desiring a career longer than twenty years. There are limited vacancies in MOS 351A, 811A, 821A and 831A, however, multiple vacancies exist in MOS 521A and 621A. Engineer commanders are requested to encourage and assist applicants for integration. References are AR 601-100 and DA Circular 601-62.

BRIDGING

STATUS OF ARMY ENLISTED CIVIL EDUCATION PROGRAM

Fully Funded Enlisted Education Program

Recent congressional action has eliminated budget appropriations to support the FY 76 Fully Funded Enlisted Education Program, which allowed selected individuals to receive up to two years of civil college education at government expense. As a result, new enrollments in the program have terminated; all pending applications on file at MILPERCEN's Enlisted Personnel Directorate are being returned.

Fellowships, Scholarships, Grants

The Fellowship, Scholarship or Grant Program—which authorizes qualified individuals to compete for educational programs offered by corporations, foundations, funds or educational institutions—is still available to eligible enlisted personnel. This program provides outstanding soldiers an opportunity to study for periods up to two years in disciplines which will satisfy Army skill requirements. These disciplines will be announced at a later date. It is expected that the skills required will be mainly in the scientific and engineering fields. See AR 621-7 for details.

Tuition Assistance Programs

Soldiers are encouraged to contact their local education advisor for information on programs available for the continuation of their off-duty educational pursuits under the General Education Development Program (See AR 621-5). Tuition assistance allows for appropriated funds to be used to pay 75 percent of tuition costs, or fees in lieu of tuition costs, for Army personnel attending off-duty classes conducted by regionally or nationally accredited civilian education institutions.

Bootstrap

The Army plans to request congressional permission to reestablish initial soldier participation under the Enlisted Undergraduate Degree Completion Program (Bootstrap), which was terminated in October 1974. Major commanders will be notified if and when the program is reinstated.

REMINDER FOR OCS PREDEPARTURE INTERVIEWS

MILPERCEN and the Training and Doctrine Command (TRADOC) are again reminding unit commanders, Military Personnel Offices (MILPOs), and individual soldiers of the requirement for Officer Candidate School (OCS) Predeparture Interviews.

The interview, required within the last two weeks before a soldier departs for training, is designed to insure that individuals are still as qualified to attend OCS as they were at the time of their selection. The interview places special emphasis on motivation as well as physical, personal, and financial qualifications. Despite this, many soldiers still are not receiving their final interviews and are found to be unqualified when they arrive for training and must be cancelled from the class and returned to their units. These last-minute nonenrollees hold quotas that could have been filled by stand-by personnel who remained qualified.

MILPOs are reminded not only to insure the proper filing of the narrative summary of the interviews, but also to conduct a verification to insure that selectees possess the necessary qualifying test scores that are normally posted in the candidates' records.

Individuals involved in the OCS application chain may obtain detailed guidance for processing OCS applications and Predeparture Interviews by referring to AR 351-5, "Army Officer Candidate Schools."

THE GAP

ENLISTMENT BONUS PROGRAM CHANGES

The Army's Military Personnel Center has announced that effective 1 June 1976, only those individuals who are within mental categories I-III and possess High School diplomas may enlist for six MOSs within CMFs 11 and 13 and be eligible to receive Enlistment Bonuses (EBs).

By 1 June, the phased reduction will limit the MOSs for which enlistees may receive EBs of \$1500 to 11B, 11C, 11D, 11E, 13B, and 13E.

As exceptions to the new policy, individuals who enlisted into the Delayed Entry Program (DEP) before 12 January 1976 and who are scheduled to enter active duty after the implementation of the reduction program will be eligible to receive the bonus based on the criteria in effect at the time of their entry into the DEP.

More information and detailed implementing instructions for the new policy are contained in the MILPERCEN message 121510Z Jan 76, "Enlistment Bonus Program Changes."

AIRBORNE AND SPECIAL FORCES VACANCIES

The Army's Military Personnel Center has projected Special Forces and Airborne vacancies in 420 MOSs at various grade levels for Fiscal Year 1977.

Interested personnel not serving in stabilized assignments as a result of enlistment options for particular units or installations may submit applications for Airborne or Special Forces duty in accordance with AR 614-200. Soldiers in stabilized assignments also may apply provided waivers of commitment are forwarded with their applications. Those who previously initiated requests to terminate Airborne duty are not eligible to apply unless the termination was for hardship or compassionate reasons.

Application for Airborne vacancies will be processed under Chapter 10 of AR 614-200 and must include:

- either the date of Airborne qualification or a statement of willingness to attend Airborne training;
- the soldier's current grade;
- the MOS vacancy for which the soldier is applying, which may be at the soldier's current or next higher grade;
- a statement as to whether he is entitled to dependent travel and movement of household goods at government expense;
- date of last PCS move and whether the move was from overseas or within CONUS; and
- a statement that he meets the selection criteria outlined in AR 614-200.

Applications for Special Forces vacancies must include the same information required for Airborne duty as well as a statement of the soldier's linguistic ability. Special Forces applications are governed by Chapter 12 of AR 614-200.

A detailed listing of the 420 MOSs having vacancies by grade level and further guidance concerning the program may be found in the two-part MILPERCEN message 041500Z December 1975.

ENLISTED DA FORM 2-1 REPRODUCTION REQUIREMENT EASED

The requirement for Military Personnel Offices (MILPO) to submit copies of E6-E9 Personnel Qualification Records, DA Form 2-1, to the Enlisted Records and Evaluation Center after the soldier's annual records review has been discontinued, according to MILPERCEN.

The requirement, initiated in October 1973, also specified that a copy of page 1 of the form must be reproduced when the soldier was considered by a promotion selection board if there had been a change in certain items since the last annual records review.

The elimination of the requirement is a part of MILPERCEN's effort to reduce the workload at the MILPO and to save both manhours and material. Now, MILPOs will only be required to furnish copies of the form on an as-need basis, such as for future promotion selection board processes.



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