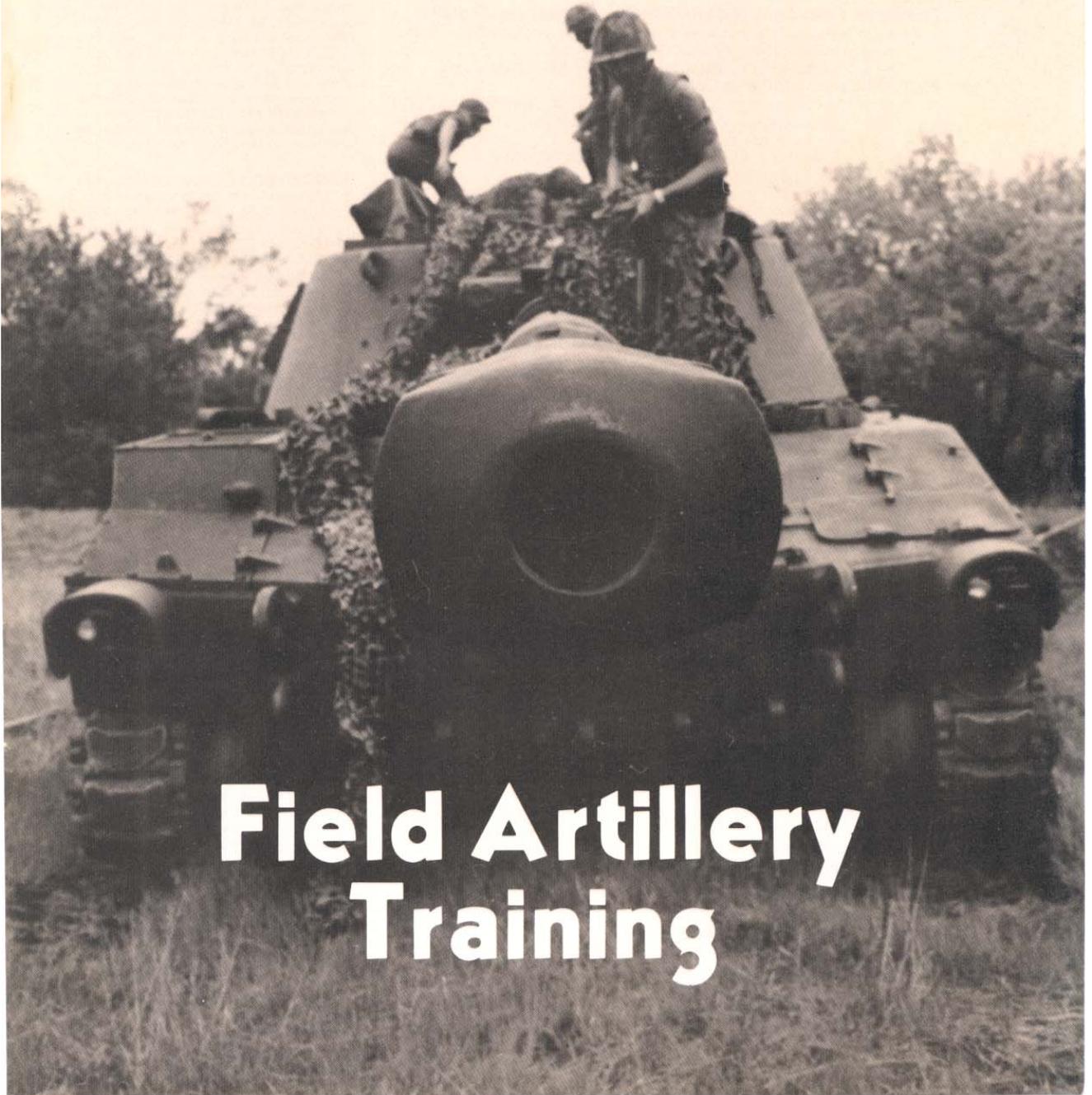


Field Artillery Journal



July-August 1981



Field Artillery Training



the journal of fire support

Volume 49

July-August 1981

Number 4

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Field Artillery Journal

On the Move

by MG Edward A. Dinges

As most readers are aware, the issue of field artillery survivability has been a recurring theme in the *Journal* during the past few years. Awareness of the ever increasing counterfire threat, controversy regarding the most appropriate methods to counter it, and revived concern for battery defense on a fluid, highly porous battlefield have all contributed to a nearly continuous debate about how artillery can and should seek to survive in combat.

Reflecting that concern, the Field Artillery School last year undertook a broad examination of the developing threat to artillery and the survivability techniques currently employed in a number of western armies in addition to our own. The results of this examination were published in the May-June 1980 edition of the *Journal*, with the request that readers in the field comment with their own views and experience. Your response was excellent; and after consideration and incorporation of your views, we distributed in April our first coordinating draft of Annex X, "Survivability," to FMs 6-20-1 and 6-50, containing guidance on the development of unit survivability procedures.

The survivability considerations outlined in Annex X reflect three fundamental conclusions:

•*First, the threat to artillery is multidimensional.* No single survival technique will protect artillery against all threats. In fact, techniques which will protect us against one threat may well increase our vulnerability to another.



For example, dispersal of fire unit elements is probably the most effective protection against a counterfire threat — particularly when, as in the case of Warsaw Pact doctrine, that threat depends heavily on acquisition by radio direction finding, massed fires, and targeting by standard templates. But dispersal also radically increases the difficulty of defending against ground attack even by small enemy units.

Similarly, a frequent movement can help reduce the risk of counterfire and ground attack — but only at the price of degrading fire support and exposing moving units to detection and attack by air.

Choice among these generic techniques is therefore highly sensitive to the nature of the principal threat; when that threat changes, so also may the preferred means of survival.

•*Second, artillery survival is a derivative, not a primary, objective.* Occasionally, in our concern for survivability, we may forget that our principal business is to deliver responsive fire support. No combat arm is immune to the

hazards of battle, and leaders must be prepared to accept risks in order to accomplish the mission. For the field artillery, which necessarily exposes itself every time it moves, shoots, or communicates, each generic survival technique imposes some price in responsiveness. Piece dispersal complicates fire control, increases the difficulty of ammunition replenishment, and may introduce sheaf errors. Hardening of positions fatigues unit personnel and may impose traverse limits which restrict our ability to mass. And, of course, too frequent displacement can take us out of action just as effectively as enemy fire — and with no enemy expenditure of ammunition.

In each case, the price of survival may be greater than the mission will bear. But the mission must always come first.

•Third, for both reasons just noted, the selection of a survival technique is a tactical, not simply a procedural, decision. Every such decision will involve difficult trade-offs, and those trade-offs must reflect the same considerations of mission, enemy, terrain, and troops which influence any other tactical decision.

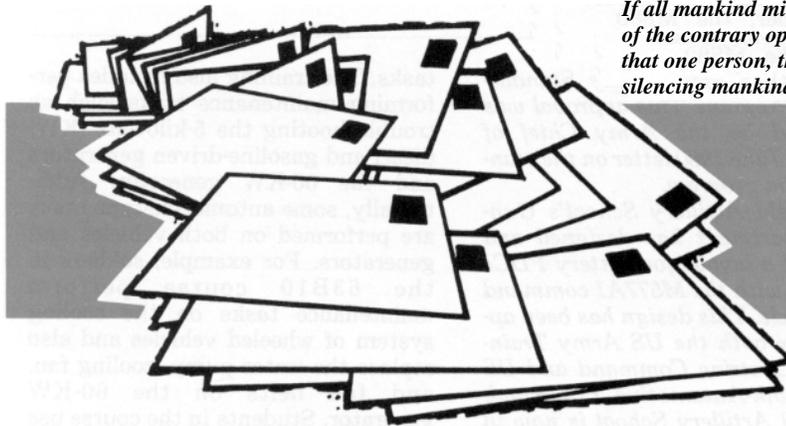
In line with these conclusions, Annex X is not intended to be a "school solution" to the survivability problem. No such solution exists. Instead, the Annex was designed explicitly as a decision aid for the commander. Its purpose is to identify elements of the tactical situation which bear (or should bear) on the choice of survival method and to encourage systematic consideration of those elements each time a unit occupies a new position.

Needless to emphasize, we would welcome reports from the field about the utility of the Annex and suggestions for its refinement. But, first, battery and battalion officers and noncommissioned officers must *read* it and *use* it. As is always the case, the real crucible of our tactics and procedures is out in the field.

In the meantime, if there is a final conclusion to be drawn from our examination of the survivability problem, it is that field artillery unit survivability doesn't just happen; it requires planning, attention to detail, and, most of all, frequent practice. ***In combat, those units will survive which have made the improvement of survivability habitual.*** Not all survival procedures are expensive. Any battery perimeter defense can be enhanced by planning defensive fires by adjacent units. It costs nothing to insure that crew-served weapons are tied in with Redeye/Stinger or divisional air defense coverage. Tight light and camouflage discipline minimizes vulnerability to visual detection with little if any penalty to effective operations. A host of techniques are available to reduce the risk of electronic detection, from rigidly-enforced communications discipline to directional antennas and remoted radios. All of these help to provide the best protection of all: avoidance of enemy detection.

Of course, sooner or later we *will* be detected — by our own shooting if in no other way. Even then, there are things we can do cheaply to cut our risks. Digging the battery in fully may be beyond our means or precluded by mission requirements. But we *can* dig in the most vulnerable elements — wire, switchboards, collimators, and even FDCs. We can keep ammo off the ground, rotating ammo resupply vehicles among howitzers as required, and insure that every soldier has rapid access to cover. And if the situation calls for rapid displacement under attack, we can insure that egress routes have been planned, alternate positions selected, and reaction procedures developed and rehearsed.

All of these practices and others are learned quickly in combat — but the price of the lesson is high. Our challenge is to develop the habits of survival now, before the battle, while the learning is free. 



If all mankind minus one, were of one opinion, and only one person were of the contrary opinion, mankind would be no more justified in silencing that one person, than he, if he had the power, would be justified in silencing mankind. "On Liberty"—John Stuart Mill

Incoming

letters to the editor

Interdiction

I read Mr. Malleck's article "Interdiction" in the March-April 1981 *FA Journal* and agree that interdiction is a critical aspect of modern warfare and could be instrumental in resolving major confrontations on mainland Europe. But interdiction may be as much a function of material aspects as it is a function of artillery command and control.

Interdiction, as pursued during the Southeast Asia involvement, may have created an impression in many minds that is not necessarily representative of what it could be or should be. For example, in Southeast Asia, tube-fire projectiles, fuzed to function on impact or delay, thus providing firepower at the lowest cost of expendables, proved to be the primary interdiction solution.

Webster defines interdiction as "artillery fire or air attack directed on a route or area to deny its use to the enemy." Such a definition gives rise to a critical element of interdiction not often recognized; i.e., that denial usually involves time.

Area denial has been a thrust of our munitions technology community for many years. While we have been successful in generating area denial materiel capabilities, we, as a defense community, have been relatively unsuccessful in creating methodology for evaluating and quantifying denial in a form acceptable to the combat arms.

Case in point: Honest John M186 warheads were deployed to Europe and the Pacific in the early 1960s and withdrawn when Lance was fielded. These warheads had 4,800 individually fuzed munitions, 1,000 of which (M40) detonated on impact and the other 3,800 (M38) detonated randomly over one and one-half hours. FM 6-141-2 never recognized the existence of the M186 warhead because its tactical value was not

quantified.

Lance, for its range, could be a prime candidate to carry area denial capabilities. It does not, nor does MLRS.

In my mind, the most cost-effective interdiction capability in Southeast Asia could have been 155-mm M692/M731 projectiles. These contain antipersonnel, tripwire activated, self-destructing mines. One battery volley could have established a denial capability over a large piece of real estate for days. While each round is relatively expensive, the tactical utility of area denial is accomplishable at low expenditures of shell and very low cost.

Current antiarmor, self-destructing, scatterable mines are capable of delivery by many systems including artillery tubes, rockets, and aircraft. This area denial capability is certainly available against second echelon armored forces.

New random delay munitions can be adaptable to tubes, rockets, and aircraft delivery for the denial role and can be field-adjusted to a strike mode.

The Field Artillery Center should consider the value of time in the interdiction or denial equation and create materiel requirements which take advantage of this capability and are consistent with priorities for these types of targets.

Martin B. Chase
C, Selected Armaments Division
Armament Systems Directorate
Dover, NJ

We "ain't" there yet

Readers who skipped over MAJ George Demetriou's "FTX Sankt Georg" in the March-April 1981 *Journal* should take the time to dig it out and read it now, especially if they're in the tactics or doctrine business.

To begin with, it was refreshing to read an account of a unit's exercise

participation that didn't declare everything to be "highly successful" (as so many do). Instead, Major Demetriou presented an outstanding report — warts and all — of the things that happen when tactical theory is applied in the field. He clearly illustrated that "we ain't there yet" in solving the shooting versus surviving dilemma. The experience of the 1st Battalion, 83d Field Artillery, in the exercise should surely be cranked into someone's doctrinal data bank.

I did find fault with the claim that this was "the first time a US unit has been controlled by the German Army." I was a member of the 2d Battalion, 18th Field Artillery, in 1969 when it deployed from Fort Lewis and spent several weeks attached to the III German Korps during FTX Grosser *Roesselspring* (I can't recall there even being any other US units in the exercise). I suspect other units have had similar experiences.

This minor flaw, however, in no way diminishes the message in Major Demetriou's excellent article.

Robert R. Edwards
LTC, FA
III Corps Artillery
Fort Hood, TX

Rocket artillerymen

I am seeking information on rocket artillerymen to update and, in many cases, establish history of US rocket technology and combat capabilities. World War II and Korean War veterans are storehouses of data and experience.

I am searching for unit histories, effects of rockets, and anecdotes of your combat experience. If you can offer any assistance, please write:

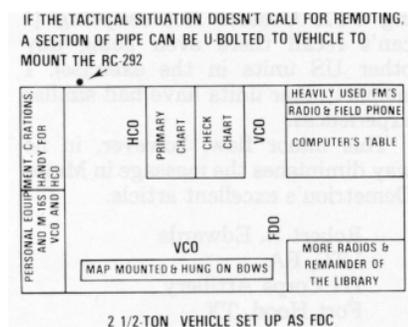
CPT Samuel S. Wood Jr.
2d USAFAD
APO New York 09035

Fire direction center

While reading the letter of MSG Timothy D. Maynard, MIARNG, in the March-April 1981 *FA Journal*, my own experience as battery fire direction officer (FDO) of my battery came to mind. My unit trains at Fort Drum which has some of the heaviest rainfall in the United States and has soil, vegetation, and general climatic conditions similar to those in Europe.

During wet weather, the M880 bogged down more often than any other of our vehicles (2½-ton, 5-ton, ¼-ton, and Cat). In addition it had the largest fuel consumption rate of any of these vehicles which is particularly critical, since the amount of fuel allocated for our Annual Training is limited. For these reasons I don't believe that the M880 is suitable for use in Europe.

During our Annual Training, we used a 2½-ton as a fire direction center (FDC). It was set up as shown in the accompanying sketch. It proved spacious and mobile enough to accomplish our mission in a highly satisfactory manner. For safety during training, I, along with the FDC members and medic attached to our battery lived in or around our vehicle, provided camouflage, and our own security and sanitation.



I would like to add that during my 12 years of military experience (both Active and Reserve) including a tour in Vietnam, the National Guardsmen I served with performed in a highly efficient, professional, and soldierly manner.

Michael E. Murphy
2LT, FA
C Btry, 1-258th FA
Bronx, NY

Department of the Army has approved the concept of standardizing the physical layout of battery fire direction centers (FDCs) Army-wide under the umbrella of

the Army Standardization Program. This approval was announced by the Army Chief of Staff's 10 June 1980 letter on the standardization program.

The Field Artillery School's Gunnery Department has designed and evaluated a layout for battery FDCs equipped with the M577A1 command post vehicle. This design has been approved by both the US Army Training and Doctrine Command and US Army Tank-Automotive Command. The Field Artillery School is now in the process of developing the best method to implement the Gunnery Department's design. Upon approval by TRADOC and DA of the recommended method, necessary instructions will be issued to all artillery units equipped with the M577A1 to enable them to reconfigure their FDC vehicles in the standardized manner.

The Gunnery Department also plans to design standardized layouts for FDCs equipped with vehicles other than the M577A1.—Ed.

Generator maintenance

Units requiring generator power are continually searching for effective methods of keeping the equipment operational. Over the years, this search has led to a special military operational specialty (MOS) for operation and organizational maintenance (MOS 52B) with tables of organization and equipment (TOE) changes to add generator operator spaces and, later, the deletion of the MOS. So, where do we stand now?

Currently, *operation* of the generator is the *additional* responsibility of any MOS so designated by the unit commander, *organizational* maintenance is the responsibility of MOS 63B, and *support* maintenance is the responsibility of MOS 52D.

Direct and general support maintenance is taught in the 52D10 course at Fort Belvoir, VA, while organizational maintenance of generators is taught in the 63B10 course conducted at three Army training centers: Forts Dix, Jackson, and Leonard Wood. As the proponent for MOS 63B, the US Army Ordnance Center and School has recently revised the 63B10 course as part of a continuing effort to improve generator maintenance.

All MOS 63B10 soldiers graduating from the revised course are expected to have additional skills and the knowledge to perform power generation equipment maintenance tasks. The training also

includes performing maintenance tasks such as troubleshooting the 5-kilowatt (KW) diesel and gasoline-driven generators and the 60-KW generator. Additionally, some automotive-type tasks are performed on both vehicles and generators. For example, soldiers in the 63B10 course perform maintenance tasks on the cooling system of wheeled vehicles and also replace the water pump, cooling fan, and fan belts on the 60-KW generator. Students in the course use test equipment to troubleshoot vehicle and generator electrical systems. Field application of generator sets, generator set selection, installation and paralleling of the 60-KW generator is also taught. In addition, students are required to perform scheduled preventive maintenance checks and services (PMCS) on the 5-KW gasoline and diesel driven engines and 60-KW generator sets.

Testing of generator maintenance tasks is included in an eight-hour end-of-course performance test. Maintenance tasks that have been taught and some tasks that are not taught in the course are tested to evaluate transfer of skills and knowledge. This revised course was implemented in the fall of last year at the three Army training centers teaching the 63B10 course.

Even though the duties of MOS 63B10 do not include operation of the generator, the soldier with MOS 63B10 must be able to operate the generator to perform PMCS and many maintenance tasks. Therefore, some generator operation is taught in the 63B10 course along with maintenance tasks.

Since the generator operator is an additional duty of any MOS so designated by the unit commander, generator operators must be trained on-site in the unit. Soldiers with MOS 63B should be used to assist in training generator operators to perform generator maintenance. This on-the-job training (OJT) should include all aspects of generator operation including operator maintenance. The following listed TEC lessons can help you in your OJT effort:

- 1-662-051-7601A—Location and Installation of GED Generator Set.
- 1-662-051-7602F—Servicing of GED Generator Set, Part I.
- 1-662-051-7603F—Servicing of GED Generator Set, Part II.
- 1-662-051-7604F—Servicing of GED Generator Set, Part III.

- 1-662-051-7605E—Servicing of GED Generator Set, Part IV.
- 1-662-051-7606F—Preparing the GED Generator Set for Starting.
- 1-662-051-7607F—Preparing the GED Generator Set for Starting and Stopping.
- 1-662-051-7608F—Preparing the GED Generator Set for Load.
- 1-662-051-7609A—Tech Tables for Servicing and Troubleshooting of GED Generator.
- 1-662-051-7610E—Operation of GED Generator Set.
- 1-662-051-7611F—Temporary Expedite Repair for Cables.
- 1-662-051-7612A—Computing Load and Selecting Appropriate Generator.
- 1-662-051-7613A—Balancing Load and Drawing Distribution System.
- 1-662-051-7614A—Selecting Proper Line Cable.

These TEC lessons should be available at your battalion learning center or audio-visual center. If not, you may obtain them by writing to:

Commander
US Army Training Support Center
ATTN: ATIC-AET-TP
Fort Eustis, VA 23604

In summary, more emphasis has been placed on providing MOS 63B10 soldiers with theory pertaining to generators and electricity, teaching more maintenance tasks on fewer models of generators, and providing the opportunity for students to perform tasks on both automotive vehicles and generators. Commanders, however, are the key to insuring that operator personnel are trained through supervised on-the-job training, and high quality personnel should be selected for this purpose.

J. E. Rozier
BG, USA
CG, US Army Ordnance Center and School
Aberdeen Proving Ground, MD

Pershing rifles

I am writing a detailed history of the National Society of Pershing Rifles — an ROTC honorary organization, founded in 1894 in honor of then Professor of Military Science and Tactics at the University of Nebraskas, 1LT John J. Pershing.

I work for the national headquarters of the present organizations, and they

estimate that over 75,000 former members are alive. I would appreciate hearing from any former members or anyone having information on the organization. I am interested in both personal experiences and historical information. All loaned materials will be returned.

Interested individuals may contact me at the following address:

Kevin M. Born
Cadet, Army ROTC
1806 "A" Street #5
Lincoln, NE 68502

Don't forget your FIST!

On page 59 of the March-April 1981 *FA Journal* there is an error with respect to the navigation equipment listed in figure 2, FIST major equipment summary. The type equipment listed is "PADS" but the correct listing is PLRS or Position Locating Reporting System. PADS is the Position and Azimuth Determining system which is issued only to survey sections. PLRS is currently under development and will be fielded in 1984.

Roy E. Penepacker
Field Artillery Specialist
DCD, USAFAS
Fort Sill, OK

You are correct and thank you for pointing out the error.—Ed.

Ballistic shields

I read the article, "Letter to an Artilleryman," by LTC Donald K. Griffin (September-October 1980 *FA Journal*) with great interest. As an artilleryman with an 18-tube M110A2 battalion, I have had ample opportunity to visit the Border and help formulate the plans which will win the first battles of the next war. However, my confidence in our howitzer crews is offset by the recognized lack of survivability that this weapon system offers to the cannon crewman.

In accordance with the article I mentioned, I obtained a copy of AMSAA Interim Note No. SV-13, "Do It Yourself Ballistic Protection," June 1979, unclassified, and it really sounds like the best thing going to correct this problem. Unfortunately we do not seem to have the \$100,000 that it will take to obtain the multiply nylon blankets for our equipment. Lieutenant Colonel Griffin's article mentions the on-going project to develop ballistic shields for the

M110-series howitzers; but, on this side of the Atlantic, I feel that the solution is needed today and not tomorrow. I also believe that if the funding were allocated to purchase these blankets as an interim solution, there would be numerous uses for these blankets after the DA-approved Modification Work Order arrives and is applied to our equipment.

Hopefully, this letter will generate some support for a move to increase the survivability of cannon crewmen today — not tomorrow!

Robert E. Grossman
CPT, FA
Liaison Officer
2d Bn, 83d FA
APO New York

Research program

The United States Army Military History Institute sponsors an advanced research program in military history. Individuals selected to work as "advanced research project associates" receive a \$500 grant to cover expenses while conducting research and writing at the Institute. Deadline for submission of applications is 1 January 1982. Application forms may be obtained by writing to Benjamin Franklin Cooling at the address below.

Benjamin Franklin Cooling,
Ph.D.
Assistant Director for Historical Services
US Army Military History Institute
Carlisle Barracks, PA 17013

Correction

Reference our response to Question 11 in the May-June 1981 *Journal* regarding standardized configuration for the FIST M113, the answer given was partially in error.

Rather than, "*The difference kit was issued to USAREUR in 1979 and to other major commands in 1980 when it was indicated that the M113 would be made available for FIST use,*" the response should have pointed out that: "*The difference kit was issued to USAREUR in 1979; however, procurement for issue to other major commands (MACOMs) was not initiated until 1980 when the MACOMs (FORSCOM/Eighth Army) indicated that M113s would be made available for FIST use.*"

Hot off the Hotline



Your "Redleg Hotline" is waiting around the clock to answer your questions or provide advice on problems. Call AUTOVON 639-4020 or commercial (405) 351-4020. Calls will be electronically recorded 24 hours a day and queries referred to the appropriate department for a quick response. Be sure to give name, rank, unit address, and telephone number.

Please do not use this system to order publications. Consult your FA Catalog of Instructional Material for this purpose.

1. **Question:** Does Fort Sill print a special retrofit for the TI-59 calculator with a new revised record of fire?

Answer: There is no special record-of-fire form for use with the TI-59 calculator. DA Form 4504 is used. The only special forms for the calculator are the concurrent and subsequent met data correction sheets, FS Form 1301 (TEST).

2. **Question:** How can I obtain some munitions effects tables for the 105-mm, 155-mm, and 8-inch howitzers?

Answer: The national stock numbers (NSNs) to order Graphical Munition Effects Tables (GMETs) are as follows:

•Training (U): NSN 1220-01-021-7277.

•155-mm (C): NSN 1220-01-021-7279.

•8-inch (C): NSN 1220-01-021-7276.

Initiate your requisition through your unit supply channel in accordance with Common Table of Allowance (CTA) 50-970.

3. **Question:** Our unit has the current

TMs covering the M109 and M109A1, but we would like to know if there are TMs available on the M109A3.

Answer: Upon receipt of your M109A3 howitzers, you will find Change 1 to TM 9-2350-217-10N in the basic issue items (BII) for each howitzer. This change will address the M109A3 version of this weapon and must be posted in the basic manual.

4. **Question:** Is the gridded thrust template still used for hasty fire techniques? If not, is there any procedure which will simplify transmission of fire planning?

Answer: The gridded thrust template is no longer authorized for hasty fire techniques. FM 6-20, page 139, provides a discussion on quick fire planning.

5. **Question:** Which tabular firing table is used with the 155-mm M114A1 howitzer?

Answer: FT 155-Q-4.

6. **Question:** When firing illuminating projectile M485 green bag propellant, what data is used?

Answer: When firing charges 3, 4, and 5 green bag (M3A1) propellant, use charges 3, 4, and 5 white bag (M4A2) propellant as these muzzle velocities are the same. Reference: FT 155-Q-4, Change 2, dated 1 April 1969.

7. **Question:** Old DA Form 4504 had spaces on the reverse for registration computations, transferring GFT settings, and PTC computations, but the new forms do not have these spaces. Is there a new form which has these computation blocks or must we locally reproduce this portion of the old form?

Answer: DA Form 4504 (Record of Fire) was divided into two forms in October 1978. The portion for registration computations, etc., is now on DA Form 4757 which may be procured through normal supply channels.

8. **Question:** Our battalion is an Army Reserve 155-mm general support unit. Does the School publish sample tactical SOPs for 155 units?

Answer: The USAFAS does not publish sample tactical SOPs for 155 units. However, FM 6-20-2, appendix E, provides a checklist/sample for preparing an SOP.

9. **Question:** During the past year, my fire support team (FIST) has ordered and reordered FM 6-30 with changes. Currently this battery has 23 personnel in

FIST with only four copies of the FM, three with changes. Our current need is for 15 to 20 additional copies with changes. Any help you can give us will greatly enhance our FIST training and NCO development.

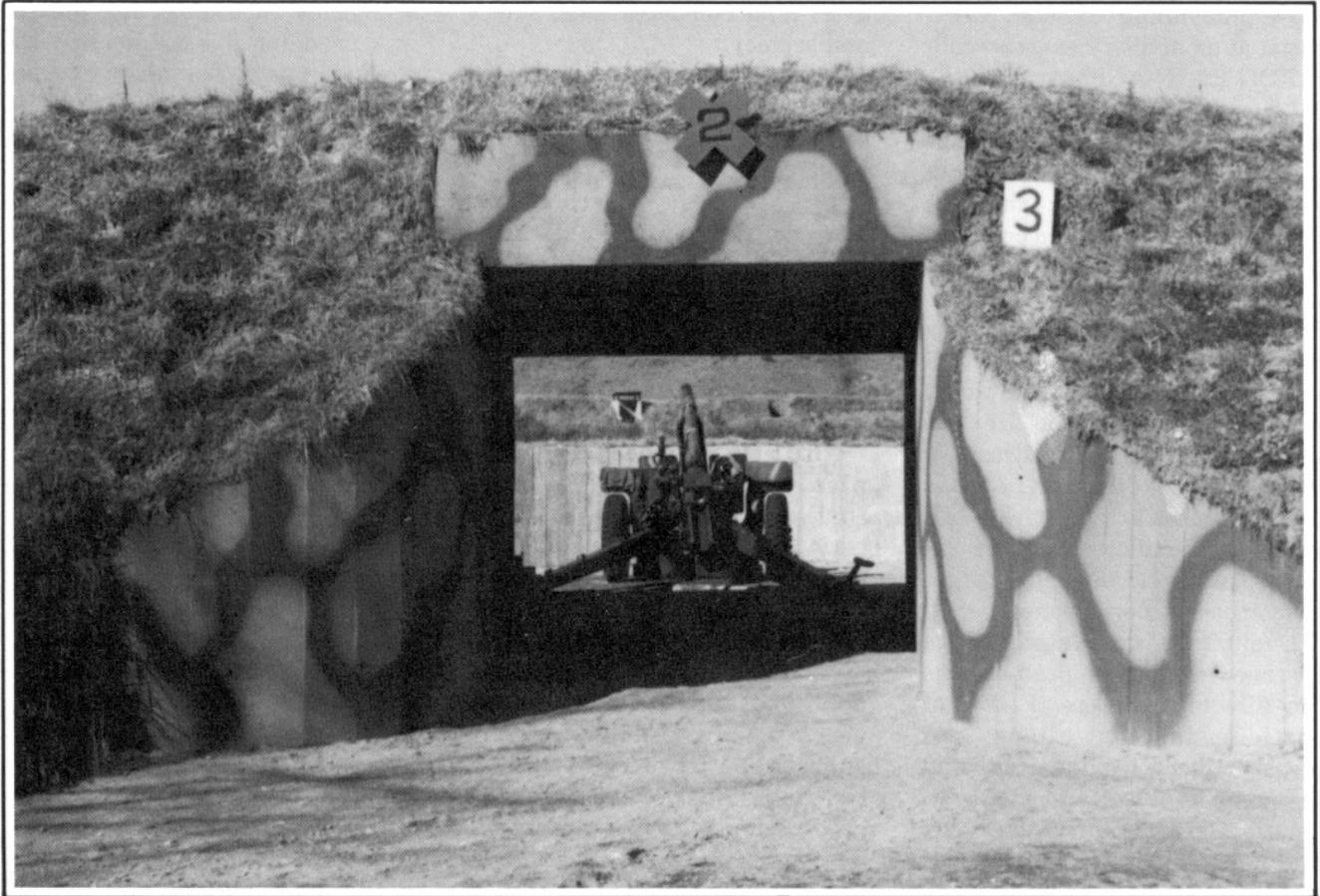
Answer: Unfortunately, we do not have the funds nor resources to provide field manuals to units in the field. I can appreciate your frustrations in obtaining additional copies of FM 6-30 for members of your FIST; however, your inquiry leads me to believe you are trying to obtain too many copies for your unit. The Army field manual distribution program, other than Soldier's Manuals, has never been designed to provide soldiers with individual copies of manuals. Usually, field manuals are kept in a unit library, where they are accessible by all members of the unit. It is perhaps, the quantity of manuals you are requesting that has led to your inability to receive them. It is recommended that you pursue this matter with the division Adjutant General's Office if you still feel compelled to obtain additional manuals.

10. **Question:** Reference ARTEP task "Fire a high explosive mission under illumination." Is this mission to be fired as a two-gun lateral spread, or is it totally up to the discretion of the fire direction officer? What are the criteria? What do the evaluators want to look at when that mission is being fired?

Answer: The decision to use a lateral spread is determined by the observer since he is viewing the target. The condition is listed as two guns simply to save ammunition expenditure since it is indicated that an ammunition shortage exists. The criteria and what the evaluators want to see is the successful coordination of both the illumination and HE rounds achieving the desired effect within the 18-minute time frame stated in the ARTEP manual.

11. **Question:** Reference FADAC Cannon Revision 6, Program Control, Reference Note 1980, page 3-76, paragraph 3-39, "Storing Targets from Hasty Fire Plans" narrative. Are we going back to the gridded thrust line? Is this still in the system? If so, where can I reference it?

Answer: The Reference Note is in error inasmuch as the gridded thrust line is no longer taught by USAFAS. This comment will be reflected in a forthcoming errata sheet.



Combined Field Army (ROK/US) Artillery Readiness Exercise

by LTC Christian J. Buehler and MAJ Kim, Hee Jong

During the past year a new exercise was initiated to test the combat readiness of Republic of Korea (ROK) artillery firing units in support of a corps artillery time-on-target (TOT) mission. As such, the purpose of this article is to describe the concepts used to exercise artillery units in support of the forward defense.

Background

The Combined Field Army (ROK/US) consists of three ROK corps with each corps having a minimum of 20 assigned cannon battalions. This combat readiness posture and artillery density provides an ideal opportunity to fire a large number of units into killing zones in each corps area.

All ROK artillery units in the Combined Field Army (CFA) area are in firing positions at their respective garrison locations. Ammunition is on hand, howitzer positions are hardened, and weapons are ready to fire within minutes, if necessitated by a North Korean threat. To test the response time of the CFA units,

the Commanding General, CFA, initiated an artillery exercise called FOG RAIN ALPHA. With the CFA staff obtaining the necessary range clearance and aircraft advisory information in advance of the mission, the CG, CFA, delivered a written corps artillery time-on-target fire mission to a designated corps commander. From that time the corps artillery had 30 minutes to fire "all available" artillery on the target location specified in the fire mission using TOT procedures. To enhance coordination across corps boundaries, the "all available" artillery included artillery that could range the target from adjacent corps zones.

Evaluators were assigned to observe techniques used in the fire direction centers (FDCs) of participating battalions and corps artillery headquarters and to isolate problem areas in coordination or communication links. The commanders of CFA corps and corps artillery as well as key staff officers then observed the effects of the TOT from a ground observation post after the fire mission had been initiated.

On 2 October 1980, the first FOG RAIN ALPHA exercise was initiated without prior notice. A total of 33 batteries—12 105-mm, 14 155-mm (one from the adjacent I Corps area, selected to check response of "quick fire channels") and seven 8-inch—representing 13 different battalions, fired into the Imjin range area south of the demilitarized zone (DMZ). The effects of all rounds were within 250 meters of the designated target and all rounds impacted within a time-on-target two-second bracket.

Planning requirements

Prior coordination for conducting the exercise under peacetime conditions was governed

by two overriding considerations: safety and secrecy.

- The safety measures involved were range clearance, notification of surrounding government officials, and aircraft advisory, the latter being the most difficult since normal firing information is published a week prior to firing. (Range clearances for the several impact areas are controlled by the respective corps artilleries in whose area the ranges are located.)

- To maintain the secrecy as to which corps would fire, range areas were scheduled for extended periods of time in each corps sector and civilian authorities in all corps areas were notified. Although the air advisory information was on-hand, it was not published since that would indicate which area would be "wet" and what battery locations would be firing. With the assistance and cooperation of the C-3 aviation officer, who coordinates aviation into and near the DMZ area, a method of blocking a sector defined by aircraft identifiable landmarks (VOR, beacons, routine checkpoints, etc.) could be closed for a limited period of time. By knowing which corps would fire and the TOT, the C-3 aviation officer could broadcast the necessary advisory information 30 minutes prior to firing. This provided the required safety for pilots and eliminated the one-week notice that is required for normal training activities.

Another hurdle to overcome in the planning stages was to determine the amount of lead time between announcement of the fire mission and the time-on-target. Here, it was believed that 15 minutes would be sufficient; however, some units were required to move from hardened positions and re-lay toward the training impact area rather than real world azimuths of fire. For this reason the time of 30 minutes was used for

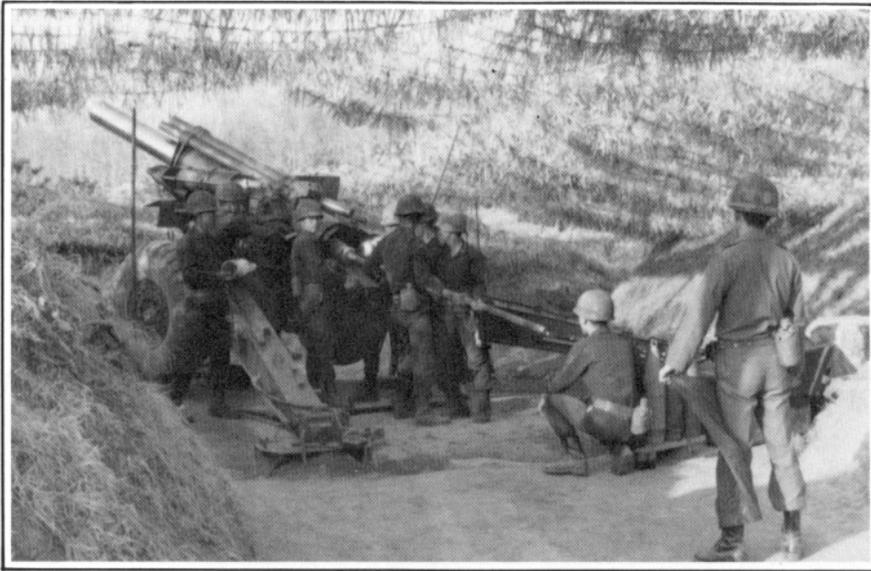
mission receipt to time of impact. To conserve corps artillery training ammunition, only one howitzer battery was selected to fire.

D-1 day:	SENDING OF WARNING ORDER.
H-3 hours:	ALERT OF FOG RAIN ALPHA.
H-1 hour:	CG's DEPARTURE TO CORPS.
H-30 min:	DELIVERY OF TOT MESSAGE. CG's DEPARTURE TO OBSERVATION POST.
H-hour:	OBSERVE FIRING.
H + 10 min:	DEPARTURE FROM OBSERVATION POST.

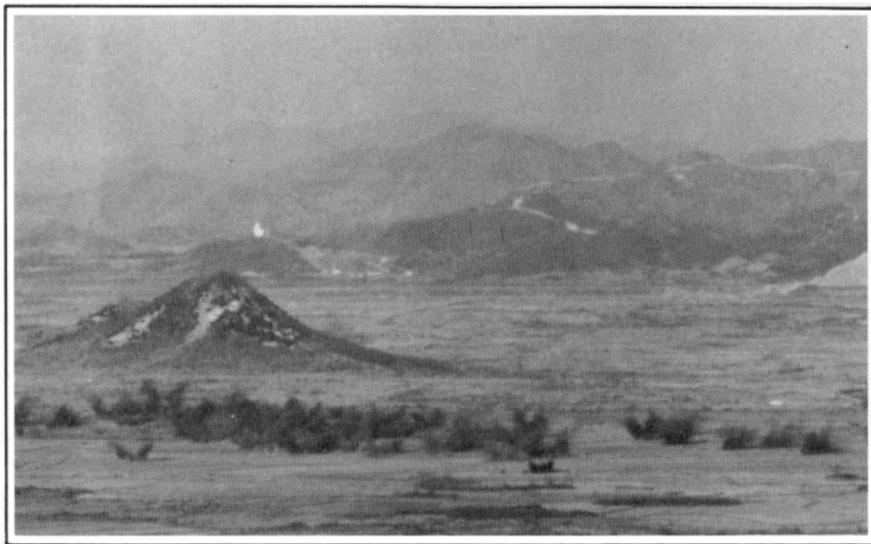
Initiating the exercise

Since this was the first exercise of this type, the field artillery officers (both ROK and US) from all headquarters staff sections were assembled and briefed. (They would later be called on short notice to participate in a combined evaluator team made up of one ROK and one US officer to evaluate a selected artillery battalion headquarters.) They were also briefed on the checklist information that would be completed during the next visit. Sufficient ¼-ton vehicles with drivers were earmarked and alerted for future callout. Since the evaluators were sent to battalion level, 12 to 15 combined evaluator teams were needed. With the briefing completed and the evaluators and vehicles placed on stand-by, the only action required was to wait for notification that the exercise had been called.

Shortly before 1000 hours on 2 October 1980, the CG designated which corps would fire, that the TOT would be at 1430 hours, and that the evaluators should be mustered. All staff sections were notified that vehicles with drivers were to be provided and that the evaluators would be briefed at



ROK gun crew in action.



“Mission complete.”

1100 hours. The artillery staff assigned evaluator teams to specific battalions, prepared grid coordinate locations for each evaluator team, and distributed printed checklists.

It must be remembered that all this activity was *internal* to the CFA staff and that none of this information had been provided to the corps headquarters. The estimated time required for evaluators to arrive at battalion headquarters was 1½ to 3 hours. Evaluators were instructed *not* to arrive before 1400 hours since

this would tip off the units selected to fire.

At 1330 hours, about two hours after the evaluator team departed, the CG and his party departed for the selected corps headquarters with the message copy of the fire mission. En route, the CG selected a target and announced that the exact TOT would be 1422 hours. On arrival

LTC Christian J. Buehler (USA) and MAJ Kim, Hee Jong (ROKA) are Operations Officers assigned to the Artillery Staff of the Combined Field Army (ROK/US) in Uijongbu, Republic of Korea.

at the corps headquarters the fire mission was presented to the VI Corps commander which started the time clock and related activities.

Time checks for countdowns were started on all radio nets while firing data was prepared and rechecked. Preparations were completed and all attention turned to the countdown. During this activity, the CFA CG, corps commander, and the corps artillery commander had displaced by helicopter to a ground observation post overlooking the Imjin range. As time-on-target approached, the sound of howitzers firing and artillery rounds massing in the air could be heard for miles. All rounds impacted on target and all within a span of two seconds (the evaluators verified that all units fired as scheduled). The first FOG RAIN ALPHA exercise was a total success.

Conclusions

Although this was the first exercise of its kind in this command, the response by all organizations from corps to howitzer section was exceptional.

All participating commanders, staff officers, and evaluators were impressed with the results and anticipate scheduling a FOG RAIN ALPHA exercise quarterly. The site of Combined Field Army (ROK/US) is one of the few locations in the world where this much firepower can be massed on a given target from garrison locations. The FOG RAIN ALPHA exercise provides this headquarters a method to evaluate the outstanding combat readiness of the Republic of Korea artillery units, positioned to support the forward defense of Korea. ☒

Field Artillery Training In Europe

by LTC Ronan I. Ellis and MAJ Marvin Wooten



Field training exercises, or FTXs by the more familiar acronym, are a routine part of every field artillery battalion's training calendar. Varying in duration from one to three or more days, FTXs have always been regarded as the highlight of an organization's training.

Ideally these training periods should exercise each element within the unit from gun crews and wire parties to ammunition trains (figure 1). Additionally, they should be integrated, realistic, and oriented on the unit's wartime mission as closely as the situation permits. These thoughts of course are not new; yet, all too often units willingly violate them, usually for the sake of expediency. Citing this constraint or that rationale, units paint themselves into unnecessary corners and blame everyone but the true perpetrator for the poor training that results.

- 1) **Exercise recall/alert procedures.**
- 2) **Execute load up of TOE equipment, prescribed load lists, and basic loads.**
- 3) **Operational readiness inspection of troops and equipment.**
- 4) **Tactical road march to assembly areas.**
- 5) **Conduct nuclear and conventional ammunition convoys.**
- 6) **Reconnaissance, selection, and occupation of position.**
- 7) **Execution of FTX with emphasis on both offensive and defensive fire support tasks.**

Figure 1. Sample list of major training events.

Training in Europe

Forward deployed battalions are usually no better at planning and executing field training exercises than stateside units, despite their being stationed in or near their wartime position areas. In Europe, for example, typical field artillery battalion FTXs tend to follow one of three formats:

- Those associated with a major subordinate command's combined arms maneuver exercise.* These field problems tend to focus on events at the maneuver brigade/battalion level; consequently, field artillery missions are usually too few moves too infrequent. This is because the maneuver commander is preoccupied with the scheme of maneuver, plus the fact that fire support coordinators (FSCOORDs) don't speak up often enough to get better field artillery play written into the script. The result is an FTX that usually asks too little of its supporting field artillery.

- Those associated with annual REFORGER exercises.* These exercises are similar in style to the kind previously cited, but they occur less often (the average USAREUR field artillery battalion participates as a player unit in only one of four REFORGERs) and tend to progress even more slowly with similar training inadequacies for the field artillery units involved.

- Those associated with training at major training areas for live artillery fire (normally Grafenwoehr, Germany).* This training, while certainly beneficial, usually sacrifices mission-oriented tactical training in favor of developing pure firing proficiency. Typically, units are interested in gearing up for ARTEPs, which means stressing shooting accuracy and speed ahead of everything else. Even in Grafenwoehr, the style of training operations is characteristic of that at any stateside post due mainly to the absence of any distinguishing urban features and the fact that Grafenwoehr has all the attendant rules and safety regulations incumbent on any live fire range.

So what is the answer? How can a forward deployed battalion BEST train to execute its wartime mission? How does it plan, organize, and conduct a realistic, integrated FTX?

Note: In developing answers to these questions we make the assumption that a unit is capable of collaterally developing its firing proficiency under live fire conditions. Additionally, as stated in the title, these responses are keyed to Europe. You will find, however, that the principles are universal in application, though exact specifics may not apply to a particular setting.

The answer to the first question lies in the inherent nature of a field artillery battalion in Europe, already deployed to its intended theater of operation; thus, the

best way for this battalion to train is to conduct *regular battalion level* tactical field training exercises in and about the German countryside corresponding to the intended wartime plan of employment. To do this the battalion must secure the use of a maneuver rights area (MRA), where a battalion can effectively duplicate its wartime mission in terms of terrain and movement conditions under which the unit must operate.

Note: Maneuver rights areas are best defined as geopolitical areas designated for use by NATO forces engaged in free maneuver exercises, subject to certain mutually agreed upon restrictions (time limit of use, areas restricted to tracked vehicles, exercise play, etc.). Areas as large as 2,500 to 5,000 square kilometers are common.

A training exercise in a maneuver rights area can provide an excellent opportunity for integrating combat service support while practicing the SOPs and tactics to be used in time of war. Also, by its nature, a battalion level exercise can proceed at a much more intensive (and realistic) pace than is frequently the case with large scale exercises. If the use of maneuver rights areas for FTXs represents the best training vehicle available for the battalion, how then does a unit go about preparing and conducting such an exercise? How can just one battalion — on its own — control and support a training exercise that ranges over 3,000 square kilometers? The answers to these questions are keyed to pre-exercise planning and coordination, development of a realistic scenario, and, finally, uninhibited creative use of one's imagination.

All large-scale combined arms exercises do not suffer from the drawbacks mentioned earlier; however, few of these exercises are designed to keep a field artillery battery, let alone a howitzer section, busily engaged. Field artillerymen must work frequently and directly with their maneuver comrades; nevertheless, it is vital that we at times go it alone to really concentrate on getting our own act together, which is nothing new for the general support battalion. It may be somewhat less obvious for the direct support battalion, but it does apply there as well.

Advantages

A field training exercise conducted in a maneuver rights area can effectively duplicate the command, control, and communication relationships expected in combat. When a battalion is operating over distances of 25 to 50 kilometers, many things can and do happen. Perhaps the most critical aspect in such a drill is communications. Here the line-of-sight

requirement for FM radio communication becomes an object lesson; e.g., battery commanders learn that they can't talk to battalion headquarters (and vice versa) with a land mass in between them. Command decisions assume real time significance with correspondingly real time execution problems. As such, wire teams learn what it means to install a battalion wire net over extended distances in an environment with dense vehicular traffic (this gives real meaning to the text book solutions of overheading and using culverts, etc., when crossing roadways with wire).

Note: We realize laying wire lines from firing batteries to battalion headquarters is a lost art within some units. We believe, however, that there will be situations where we will be able to use wire for external communication — not all the time, but certainly enough to warrant continued training emphasis. Any skill that goes unpracticed quickly atrophies to the point of uselessness.

In summary then, each element in the unit develops an experience factor for spatial and time dependent functions as they relate to actual operations in the battalion's zone of action.

Exercising the battalion in an MRA provides an opportunity for close integration of combat support and service support elements in an urban environment since the urban sprawl has overtaken much of West Germany. Thus, training in, through, and over these built-up areas is critical if we are to exploit the advantages they offer, such as cover and concealment (large buildings in towns and villages to accommodate our logistic activities) and internal lines of communications (road networks and existing telephone links). Other advantages, which are less obvious, are alternate sources of manpower and needed supplies in the form of civilian laborers and existing stocks of Class I, III, IV, and VII supplies (rolling stock). The usefulness of the urban terrain features is not always apparent until a unit conducts training in a maneuver rights area. The largest payoff to this type of exercise, though, is to be able to become familiar with the terrain. For example:

- Battery officers and noncommissioned officers develop an appreciation for positioning and the best ways to use villages, towns, and wooded terrain as position areas.

- Gun crews learn where to position their howitzers so as to minimize detection.

- Obstacles to friendly and enemy movement are identified.

- Communications capabilities are confirmed.

- Essentially, *everyone* in the unit has an opportunity to become familiar with the area of operations BEFORE

the battle starts; thus, each soldier develops confidence in his ability to function in the environment in which he will fight.

Another opportunity this training provides is a chance for each battalion element to perform its TOE/MOS assigned skill. We have already alluded to this feature but it bears repeating. Wire teams that don't lay wire and survey parties that don't perform survey *as integral functions* of a battalion's tactical field training will NEVER be able to do those jobs when called upon in combat. Likewise, these FTXs give us a chance to "flush out" our unit SOPs and ways of operating on our own. For example, assume a battalion is being road marched while observing listening silence:

- Who's in charge of the recovery effort?

- Who goes forward with the advance party from the battalion command post?

- Similarly, how does a battery warn its personnel of chemical attack when they're spread throughout a village?

- How realistic are our road march tables?

- When and where's the best place to refuel? on the march? in position? or a combination of techniques?

- Who's responsible for medical evacuation? ration distribution? repair parts resupply?

All of these vital concerns need to be resolved by the battalion prior to combat, and an MRA FTX gives the *entire* battalion an excellent opportunity to do exactly that.

Training steps

If you think this is the type of training needed by your unit but you're not sure how to proceed, the following guidelines may be of assistance.

The first, and perhaps most critical, step in terms of producing a successful exercise is pre-maneuver planning and coordination. For example:

- Decide on the area for the exercise.

- Reconnoiter extensively.

- Visit local officials in the maneuver rights area and secure their cooperation for your upcoming FTX.

- Plan for maneuver damage control and reporting.

- Have battery commanders reconnoiter planned position areas and discuss with local officials and residents where our tracked and wheeled vehicles can and cannot go. (Comply with the requests of these local citizens even if it means altering your plans.)

- If you change your plans, notify local officials and residents. (Continued use of an MRA demands the cooperation, understanding, and assistance of

local civilian officials; therefore, the terms of the exercise must be honored as set forth in pertinent maneuver rights regulations and coordinated agreements. Pushing these face-to-face coordination functions down to the battery level tends to reinforce the criticality of this aspect of the pre-maneuver coordination while also affording opportunities for greater understanding among the citizenry when we do something wrong, have an accident, or the like. Additionally, the rapport we build through this process reinforces the unit's confidence that the local citizens do want our help and are willing to support us.)

The second step is to develop a simple, realistic, mission-oriented, tactical scenario. Based on the unit's general defense plan and the alteration of unit titles, selected omissions, new boundaries, etc., an exercise operations plan should be produced that preserves the basics from the mission without compromising its specifics. The scenario should be specific in terms of events to be performed by the batteries and sections (the ARTEP task list is a good guide). Also, insure that contingency situations are addressed, and allocate time for battery and section level training. Integrate nuclear and chemical play into the scenario. Your supported unit could be asked to provide an operations or fire support cell. This element could control exercise message traffic and mission play as well as train your liaison team/fire support officer. Combat service support elements should be invited to participate in the FTX. As a minimum, a maintenance contact team should be included, and other elements could include Army aviation support, NBC decontamination teams, aerial photo reconnaissance of battery positions, and CEWI elements for monitoring, jamming, and other electronic warfare play.

The final step is to use your imagination freely in the planning and conduct of the FTX. Look for ways to inject realism at every turn. Don't accept arguments that "it's not done that way," or "we've always done it this way before." For instance, examine how you plan to simultaneously conduct nuclear and conventional fires, and then test your concepts during the exercise. Be receptive to creative solutions to problems. The problem of how to initiate selected unit level events without appointing umpires for control is always present in battalion level exercises. Here our solution consisted of issuing each battery a set of instructions in an envelope with the time for opening specified on the outside. Inside were special situations (chemical attack, aggressor attack with casualty assessments, etc.) that required the unit to respond to a particular situation.

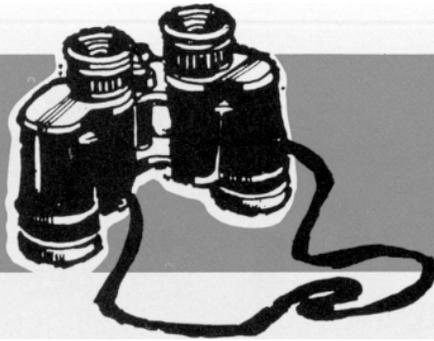


Imaginative use of local "hofs" provides both cover and concealment for military hardware.

Encourage battery commanders to take maximum advantage of the urbanized terrain in selecting unit and individual piece locations. In particular, the farmer's "hof," so common in German towns and villages, offers excellent concealment for howitzers, ammunition vehicles, and the like, while other structures can be profitably used for cover, unit headquarters, aid stations, and maintenance facilities. Again, the idea is to be imaginative and to avoid sacrificing training value for the sake of convenience or expediency.

Resource problems continue to have a severe impact on our training at every level and these problems are not going to disperse. Since these training resources are limited, commanders and trainers must maximize the training benefits derived from their use. This calls for detailed creative planning and the selection of those training vehicles which will best accomplish the training mission and thereby sustain our force readiness. A field training exercise conducted in a maneuver rights area represents the best vehicle for the achievement of battalion level non-firing tactical training available for forward deployed field artillery units. The experience our soldiers gain from operating on the terrain they are to defend is invaluable. The keys to this form of training are pre-exercise planning and the uninhibited use of your imagination. The payoff is a fully trained battalion that is competent in the execution of every aspect of its wartime mission. And that, as we are so often told, is the bottom line. ☒

LTC Ronan I. Ellis, former commander of the 1st Battalion, 30th Field Artillery, is scheduled to attend the Naval War College in August this year. MAJ Marvin Wooten is an instructor in the Department of Tactics at the Command and General Staff College.



View From The Blockhouse

notes from the school

Revision of FM 6-20

A preliminary draft of FM 6-20, "Fire Support in Combined Arms Operations," is currently being prepared by the School's Directorate of Tactics, Combined Arms and Doctrine. Suggestions for improvement of this field manual are encouraged and should be forwarded to:

Commandant
USAFAS
ATTN: ATSF-CA-D
Fort Sill, OK 73503

Please use DA Form 2028 (or facsimile) to record comments and reasons for suggested changes.

Old APAC now ACE

Many old-timers in the nuclear field remember the Atomic Projectile Assembly Course (APAC) which was once taught in the Field Artillery School. It has recently been updated and renamed the Atomic Cannon Eight-Inch (ACE) Course. Whatever you choose to call it, the course still trains individuals in the skills necessary to become an eight-inch nuclear assemblyman.

The ACE course begins on Monday morning and ends on Friday after a combined written and hands-on test. To be accepted in the course, students must have a SECRET clearance and meet the criteria outlined in chapter 3, AR 50-5. While the course is designed primarily for students who have recently completed advanced individual training, it is not uncommon to have sit-ins ranging from senior enlisted NCOs to field grade officers. Regardless of rank, each student receives the same training and is required to pass all tests before being declared a graduate of the course.

The course is broken down into two major areas:

- The first area deals with general subjects to include classes on the Personnel Reliability Program (PRP), security, courier duties, and emergency destruction.

- The second major area deals with the knowledge required to assemble the eight-inch nuclear projectile.

Approximately 50 percent of the course is devoted to supervised hands-on training where the ratio of student

to instructor does not exceed 6 to 1.

For further information, write or call the Commandant, US Army Field Artillery School, ATTN: ATSF-CT-TM-MIA, Fort Sill, OK 73503; AUTOVON: 639-4420.

Error in M109A1/A3 and M109A2 direct fire tables

The direct fire tables listed on page 2-94 of TM 9-2350-217-10N (M109A1/A3) and page 2-161 of TM 9-2350-303-10 (M109A2) are in error and will not be used for direct fire. These direct fire tables were based on the M126 short series 155-mm gun tubes, Tabular Firing Table FT 155-AH-3, charge 7.

Until the technical manuals are corrected, any direct fire should be conducted using Tabular Firing Table FT-155-AM-1, which is constructed for the M185 gun tube, charge 8, as follows:

<u>Range (meters)</u>	<u>Elevation (mils)</u>
100	1
200	2
300	3
400	4
500	6
600	7
700	8
800	9
900	10
1000	11
1100	12
1200	14
1300	15
1400	16
1500	17
1600	18
1700	20
1800	21
1900	22
2000	24
2100	25
2200	26

Crew ballistic shelter

The results of Legal Mix V studies showed that survivability of the M110 8-inch self-propelled howitzer system could be significantly enhanced by adding ballistic protection. For example, with a crew ballistic shelter (CBS), soldiers can continue operations while receiving fire and at the same time expect a reasonable level of protection.

The crew ballistic shelter consists of a removable armored cab fastened to the vehicle turret. It is similar in shape and appearance to the present winterization kit. Sight openings and doors in the front and sides of the shelter provide for fire control sighting operations. A nuclear, chemical, biological (NBC) collective protection system with a ventilated facepiece system will provide filtered air, via hoses, directly to the individual crew members. The CBS will also include a heater for use during cold weather operations.

The CBS will remain installed on the weapon for all normal operations (e.g., road march, firing, etc.) but may be removed by the howitzer crew for special operations (e.g., railroad movement). The ballistic shelter and NBC protection system will be applied by a depot or contractor team on-site at the unit's location.

Future testing is intended to assess the effectiveness of the crew ballistic shelter, compatibility with on-vehicle equipment (fire control, loader/rammer, etc.), and effects on weapon mobility as well as human factors.

A wooden mock-up of the CBS, delivered to Fort Sill for evaluation in February 1981, proved the feasibility of the design. A prototype is currently being manufactured and testing will begin in early 1982. Application of the CBS system is scheduled for 1985. (CPT Yee Litt, DCD)

Crew ballistic shelter mounted on 8-inch howitzer.



July-August 1981

COUNTERFIRE



SYSTEMS REVIEW

Target simulator for radar set AN/MPQ-4A

Training of field artillery radar crewmembers (MOS 17B) at battery level can be difficult since little or no organic assets are available to support the training. Some target acquisition batteries have access to an AN/TPA-7 target simulator but others rely on the field firing schedule of division artillery units. An alternative to these training methods is a small, compact, manually operated target simulator — the Truitt Trainer — that can be used as a training aid in AN/MPQ-4 radar sections. The Truitt Trainer (named after Mr. Woodley O. Truitt Jr., a Training Specialist in the Radar Division, Counterfire Department) is used to present simulated targets representing hostile weapons firing, at either high or low angle. Also, the trainer is capable of presenting simulated mean-point-of-impact (MPI) or high-burst registrations (complete with telescope observations and simulated targets for performing adjustment of fire.

The trainer is mounted on an aiming circle tripod, and the legs are adjusted so that the trainer is at about the same height as the B-scope of the radar. The operator views the front, looking at a small window that represents a B-scope. When "target echos" representing a high angle weapon are flashed on the trainer B-scope, the operator marks the "echos" with a white grease pencil. The marking is done on a clear surface that is in front of the trainer B-scope — the same as if the radar were being used. This surface is the target plotter. Next, the target plotter, with the marks indicating where the "echos" appeared, is removed from the trainer and placed onto the B-scope of the radar; these marks

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View From The Blockhouse

are then strobed on the actual radar in the usual manner. A delta time of 0.6 seconds is used and the computer now reads the coordinates of the "weapon" that was observed on the target simulator. Of course, the location of the weapon will depend on what azimuth and range the radar was set to observe. It will be necessary for the section chief or NCOIC to plan ahead to determine what the area of interest will be and what coordinates should be obtained. Correct procedures in marking and strobing an echo should be learned first, and accuracy of determining the locations will come with practice.

How does the trainer work? A transparent slide representing the target echos is placed into a frame on the back of the device, along with a "flash slide" that has a small clear window. When the flash slide is raised up, the window passes the target echo and light is allowed to pass from the back through the slides onto the simulated B-scope surface. Only the target echos are seen by the operator. The trainer is complete with a slide package for the following missions:

- **High angle**—Eight different targets, four firing from right to left and four firing from left to right.

- **Low angle**—Eight different targets are possible, four firing from right to left and four firing from left to right.

- **MPI registration**—An MPI mission may be performed by using the low angle slides. Although only four rounds are available, these may be repeated to furnish the number of rounds required for the mission (up to eight).

- **High-burst registration (B-scope)**—Eight rounds are possible. These include three "good" rounds and one "bad" round, and they may be repeated as required for the mission.

- **High-burst registration (telescope)**—To conduct an actual high burst mission, the rounds must be observed through the radar telescope. There are slides representing the reticle of the radar telescope and four round bursts (three "good" and one "bad"). This set of telescope burst slides corresponds with the set of echos provided for the B-scope. A combination of the bursts are used to match the rounds used for the B-scope.

- **Adjustment of fire**—The high angle slides are used by reversing the direction of the flash slide, whereby the echos represent the descending part of the trajectory.

Use of the Truitt Trainer will allow Q-4 radar crewmembers to remain proficient in performing the primary mission of the radar—locating hostile weapons, both high angle and low angle, and performing the secondary missions of radar gunnery.



The Truitt Trainer.

All this training may be performed without the use of live fire, thus maximizing availability of training time.

The Truitt Trainer costs less than 50 dollars to manufacture, and a limited number are currently available for export by the Counterfire Department to field units. To obtain a Truitt Trainer for your radar platoon or section (if in a separate brigade) or for more information write:

Commandant
US Army Field Artillery School
ATTN: ATSF-CF-R (ROIB)
Fort Sill, OK 73503

Firefinder registration data

To perform a friendly fire mode of operation with the AN/TPQ-36 or -37 radar system, 10 separate parameters, furnished by the TACFIRE/fire direction center (FDC) must be entered in sequence by the radar operator. Regardless of the friendly fire mode selected, the 10 parameters required for a friendly fire operation are:

- Mode or type of friendly mission:
 - MA—mortar air burst.
 - MD—mortar datum plane.
 - MI—mortar impact predict.
 - AA—artillery air burst.
 - AD—artillery datum plane.
 - AI—artillery impact predict.
- Battery easting coordinate.
- Battery northing coordinate.
- Battery altitude.
- End point easting coordinate.
- End point northing coordinate.

- End point altitude.
- Maximum ordinate.
- Quadrant elevation.
- TACFIRE FDC target number.

Time of flight is not required but should be provided to aid in cueing the radar to reduce radiation time.

After the 10 parameters are entered, the radar onboard system computer automatically slews the radar antenna to the computed direction and tilts the antenna to the computed elevation. The radar computer uses an algorithm before the mission to determine whether the values of the 10 parameters provided will result in successful radar detection and tracking of the registration rounds.

The AN/TPQ-36/37 radar operator does not *optically* observe any registration; rather, the radar system electronically determines the end point locations of the rounds for each registration mode. The radar operator reports the location and altitude of each round fired to the TACFIRE FDC. The radar does not compute the mean burst location and altitude. The fire direction officer is required to determine the usable rounds of the registration and the TACFIRE FDC computes the mean burst location and altitude.

Airlifting the AN/MPQ-4A radar

During a recent airlift of an AN/MPQ-4A radar, the radar's reflector broke free from its hinges. This incident prompts a detailed review of the proper procedures to be used to prepare the radar trailer for movement by helicopter.

First, the reflector support arms must be locked in the movement position during all equipment transit (air or land) operations. This reduces strain on the elevation and azimuth positioning systems and reflector clamps in the event the azimuth stow lock becomes disengaged (TM 11-5840-208-10, chapter 2, paragraph 2-7(B)2, figure 2-10). If locking pins are not inserted, vibrations may cause the reflector clamp release to disengage, permitting the reflector clamps to rotate. Locking pins for the reflector clamps must be inserted when the reflector is in the stowed position to insure that the reflector clamps do not rotate. Such rotation could allow the front edge of the reflector to become loose during movement, permitting a backward rotation of the reflector.

The final preparation step is to add the tarpaulin cover and tie-down straps. The reflector and scanner tarpaulin must be in place and laced securely at all four corners during all equipment moves. In airlifting operations, the tarpaulin streamlines air flow around the

trailer, decreasing the air flow turbulence that tends to lift the reflector. Additionally, the reflector should be secured by two tie-down straps with a ratchet buckle end (NSN 2540-00-980-9277). The straps should be put over the tarpaulin, with one end attached to a front lifting bracket and the other end attached to a back lifting bracket on the opposite side of the trailer so they cross each other on the reflector. The straps must be snug, but not so tight as to damage the reflector.

When the trailer has been prepared, the three-sling rigging procedure outlined in FM 6-161, chapter 3, section VIII, paragraph 3-31 and figure 3-13 must be followed. Three slings of proper length fastened to the correct points on the radar trailer are absolutely essential for safe air movement. Any other rigging configuration may put undue stress on system components through rubbing or binding during flight. The four-chain-leg sling method as outlined in TM 55-450-12 (pages 13-5 and 13-6) is *not* recommended, because the slings may push against the reflector and break the support arms (use the three-sling method only!). The radar trailer, when properly rigged, can be transported as an external load by the CH-47 and CH-54 helicopters at speeds up to 90 knots (TM 55-450-11, pages 108 and 109).

All these steps are required to properly place the radar trailer in the transport configuration in order to protect the radar during air movement.

Dissemination of met messages

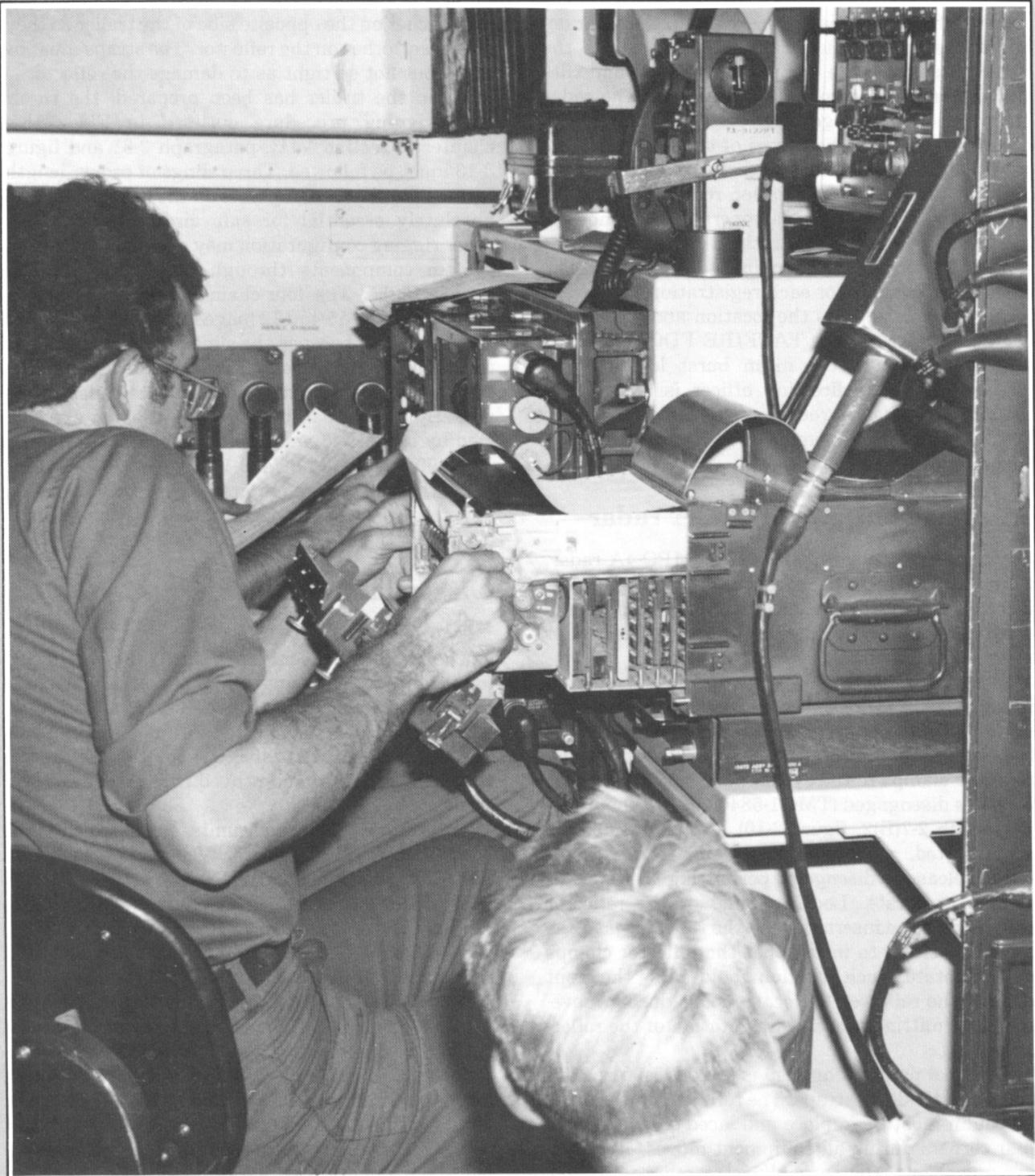
The major problem of getting meteorological (met) data to the using unit has been inadequate communications. Although the use of a "corps artillery met net" is suggested in numerous publications, this is not a satisfactory solution. A system that has been tried and proved is the one described below:

For example, using four units, one of which is the corps staff weather officer (SWO), and using RATT CF1/CF2 net, division artillery (div arty) Section A will broadcast at 0100 on parent unit's CF1, rebroadcast at 0115 on left flank unit's CF1, rebroadcast at 0130 on right flank unit's CF1, and rebroadcast at 0145 to the corps SWO on the corps met net. The only nets used are the division artillery/brigade CF1/CF2. It is the responsibility of the division artillery/brigade to insure that the battalions/batteries receive the data if they are not tied into the division artillery/brigade RATT CF1 net. By using the 20-kilometer rule to position the met sections and staggering broadcast times, it is possible to have hourly met data updates.

TACFIRE

New Equipment Training Team

by CPT Forrest G. Clark



The battalion commander is holding his weekly staff call: ". . . about two weeks after our key people return from their TACFIRE courses, the New Equipment Training Team will arrive and begin the second phase of our transition training."

- What is the purpose of the New Equipment Training Team?
- Who and what does the team consist of?
- What type of training will they conduct?
- How long will the team be in our unit?
- Will they administer a formal evaluation of our unit?

With TACFIRE fielding underway, both in CONUS and Europe, artillerymen worldwide will soon be involved in learning to use the TACFIRE system. TACFIRE is the most complex system ever acquired by the artillery—a system which affects all aspects of fire support from the forward observers to the corps field artillery section. For this reason, transition training for units receiving TACFIRE will differ from that used for other new systems. TACFIRE training consists of two phases:

- Institutional training at Fort Sill, or the 7th Army Combined Arms Training Center (CATC) in Europe.
- New Equipment Training Team (NETT) at the unit's home station.

Mr. K. Patrick Cathcart's article "TACFIRE Deployment and Training" (*FA Journal*, January-February 1981) presents a brief outline of this training program.

Most personnel are familiar with institutional training conducted by Army schools; however, few fully understand the NETT concept, which is the key element of initial TACFIRE training. Thus, the purpose of this article is to answer some of these questions by explaining the mission, organization, and training program of the NETT.

Mission

The mission of the NETT is to provide instruction and assistance to field artillery units in developing unit proficiency with TACFIRE. The NETT accomplishes this by continuing and expanding the training received in the institutional training phase.

Organization

A TACFIRE NETT is currently composed of 14 personnel. The authorized positions, grades, and MOSs are shown in table 1. When fielding of the Battery Computer System (BCS) begins, NETT teams will be augmented with BCS instructors, and units will receive training on both systems concurrently. It should be kept in mind that the 14 NETT

Table 1. NETT personnel.

<u>Position</u>	<u>Grade</u>	<u>MOS</u>	<u>Quantity</u>
Team chief	LTC	13A	1
Div arty instructor	MAJ	13A	1
FSE instructor	CPT	13A	1
Battalion instructor	CPT	13A	4
Div arty operations instructor	MSG	13Y	1
FSO instructor	SFC	13F	1
Battery instructor	SFC	13C	2
FO instructor	SSG	13F	2
Computer repairman	SSG	34G3H-Y1	1

members are spread over an entire division artillery (or a field artillery brigade) during the training period.

Battalion instructors will be concerned primarily with the battalion fire direction center (FDC) and its computer. The fire support teams (Digital Message Device), firing batteries (Battery Display Unit), and fire support officers/battalion operations sections (Variable Format Message Entry Device) will be assisted by the instructor responsible for the respective piece of equipment. The division artillery fire control element (FCE), operations section, counterfire section, and fire support element (FSE) will be trained by the division artillery and FSE instructors. All instructors will conduct formal training in their respective areas as required, in addition to assisting during practical exercises and command post exercises (CPXs) and field training exercises (FTXs). The computer repairman will assist in training unit personnel in maintenance procedures and in troubleshooting equipment problems which might interfere with training.

The NETT is authorized only that audio-visual and training equipment needed to support its normal training program. It has no capability to provide the unit with repair parts and has no equipment components of its own. Administrative and logistical support are provided by either the installation at which it is permanently stationed or the unit which is being trained.

Training program

The NETT Training Program consists of five stages as shown in table 2. The NETT conducts individual training for those personnel who do not receive institutional training. Normally this will include FIST personnel, surveyors, some commanders and staff, battery fire direction personnel, and some fire support personnel. This training, consisting of both formal instruction and hands-on training, is normally conducted during the first two weeks of NETT training.

Table 2. NETT training program.

Stage 1. Individual Training (2 weeks):

- Command and staff (40 hours).
- Variable Format Message Entry Device (VMED) (8 hours).
- Battery Display Unit (BDU) (8 hours).
- Digital Message Device (DMD) (12 hours).
- Survey (8 hours).

Stage 2. Practical Exercises (6 weeks).

Stage 3. Command Post Exercises (CPX) (4 weeks):

- Battalion level (NETT planned).
- Battalion level (unit planned).
- Div arty level (NETT planned).
- Div arty level (unit planned).

Stage 4. Field Training Exercises (FTX) (2 weeks):

- Battalion level.
- Div arty level.

Stage 5. Validation Exercise (1 week).

Command and staff instruction is attended by commanders, staff officers, noncommissioned officers, and other key personnel. Even though these individuals do not operate the system, they must be able to manage it during tactical operations. Therefore, they are taught the system's capabilities and how to control the system. In short, they learn what TACFIRE can and cannot do so that they can provide guidance and instructions to the operator and interpret data provided by the computer. Table 3 lists the topics covered during the command and staff instruction.

Instruction on the Variable Format Message Entry Device (VMED) is given to fire support, operations, counterfire, and FSE personnel who did not receive institutional training. It teaches them to operate the equipment and to input and retrieve data required to conduct tactical operations. This instruction may also serve as a review for personnel who have received institutional training. It should not, however, be considered a substitute for sending key personnel to a TACFIRE course at Fort Sill or 7th CATC.

Table 3. Command and staff subjects.

1. Introduction to TACFIRE.
2. Prepare the system for operations.
3. Artillery Control Console (ACC) and Variable Format Message Entry Device (VMED).
4. Operating system.
5. Communications.
6. Maintenance.
7. Tactical/technical data base.
8. Battalion fire mission processing.
9. Div arty fire mission processing.
10. Fire support element (FSE).
11. Artillery target intelligence (ATI).
12. Nonnuclear fire planning (NNFP).
13. Mutual support operations.

Instruction on the Battery Display Unit (BDU) teaches battery fire direction personnel and other key individuals in the firing battery how to operate equipment and interpret messages and fire commands printed on the Electric Line Printer (ELP). This portion of the NETT training will eventually be superseded by instruction on the Battery Computer System (BCS).

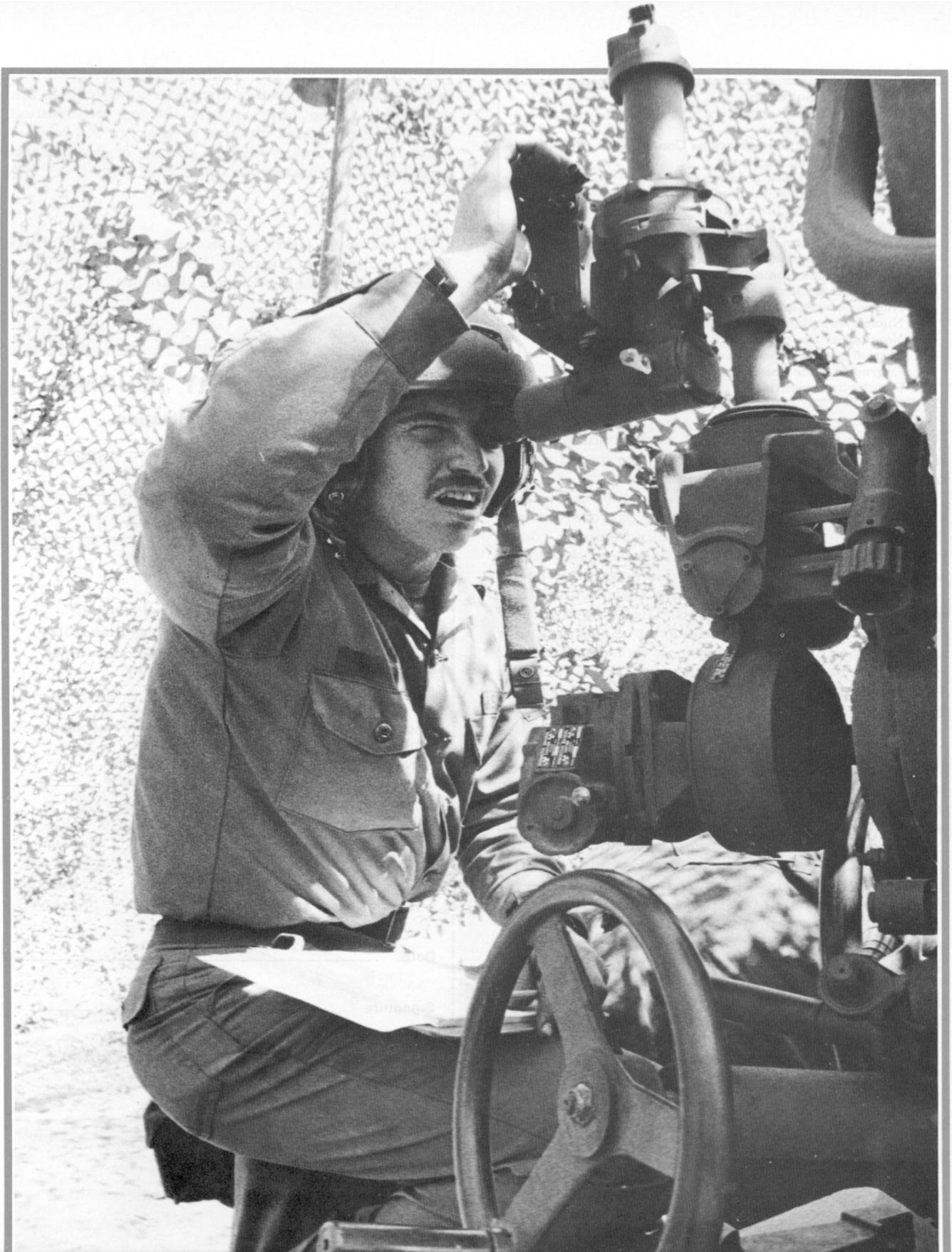
Instruction on the Digital Message Device (DMD) teaches FIST personnel how to use the DMD to initiate fire missions, submit intelligence reports, and participate in fire planning. This is mostly hands-on training, using the unit's TOE equipment. Although there is some self-paced institutional training available on the DMD, most FIST personnel must be trained by the NETT.

Survey instruction teaches key survey personnel the capabilities of TACFIRE's survey function and how to use it in their computations. Since survey data is input from the FSE or the operations section VMED, some training on the VMED is included in the survey instruction.

Upon completion of the individual training, the NETT begins collective training. The practical exercises, CPXs, and FTXs develop unit proficiency with TACFIRE. Operators learn to perform tactical operations within the framework of the overall TACFIRE system. This collective training is the core of the NETT training program.

The practical exercise stage consists of structured hands-on training, concentrating on procedures required for effective tactical operations. The exercises are progressive, beginning with a review of individual operator skills and then building toward a totally integrated TACFIRE environment. Management of the system by commanders and staffs is emphasized, along with coordination among units and sections. Learning proper procedures is stressed. Should difficulties arise, the exercise will stop until the problems are fully identified and resolved. The NETT personnel will assist, coach, correct, and help troubleshoot problems. Table 4 lists the practical exercises used by the NETT to prepare the unit for the command post exercises.

During the CPX stage, the unit gains proficiency in tactical operations while integrating all echelons of the TACFIRE system. The NETT provides scenarios for both battalion-level and div arty-level CPXs. These are designed to fully exercise the system's capabilities. In addition, the unit will develop and write its own CPXs for battalion and div arty. This allows the unit commander to establish his own training objectives, tailored to his unit's mission. CPXs are conducted either in garrison



Performance-Oriented Evaluation:

A Prerequisite to Performance-Oriented Training in Artillery Units

by MAJ Dennis E. Coates

Performance-oriented training (POT) has now taken hold as the norm in artillery units throughout the Army. Commanders insist on it, and trainers are learning to use it; in fact, many of our younger noncommissioned officers have never been exposed to any other approach to training. POT, as they say, has been "institutionalized."

However, effective POT demands more than teaching junior leaders how to train and insisting they do it right. Commanders and their training staffs must build a unit training program that supports POT. One essential element of such a program is performance-oriented evaluation.

Performance-oriented methods of evaluation have not been adopted by the Army as quickly or as widely as performance-oriented methods of training. This is most noticeable in two areas:

- Making performance the target of evaluation.
- Directing performance-oriented corrective actions.

Making performance the target of evaluation

Evaluation of training usually focuses on one or more of three areas:

- Performance.
- How trainers train.
- Training management.

Performance-oriented evaluation determines how effective a unit's training program is by focusing on *how well soldiers and units can do their jobs*.

Units and soldiers must know what is expected of them—what they are required to do in combat. Many of these missions and tasks are described in Soldier's Manuals and Army Training and Evaluation Program (ARTEPs) which are the main references for a unit's

training managers. The training objectives (tasks, conditions, and standards) contained in these manuals describe the *performance* expected of soldiers and teams. These training objectives guide the trainer in his team-building efforts and evaluators of training should use exactly the same training objectives.

There is a well-known saying: "The unit does best what the commander checks." If a commander checks statistics, schedules, or training highlights, the lower chain of command will become very adept at producing these kinds of items rather than performance. However, if he conducts unannounced performance tests of combat-critical tasks, the chain of command must insure that soldiers can actually perform. Further, if he consistently checks how well units perform as teams, units will emphasize teamwork in training. Commanders who observe and evaluate performance can quickly determine whether their goals and objectives are being met. Common examples of performance evaluations are external ARTEPs, SQTs, EDREs, and random testing of soldier/unit skills.

Several army divisions currently conduct performance evaluations with names like "Quick Draw," "Roll-out," and "Blitz." With virtually no notice, companies or battalions are required to assemble at a gunnery range or field site to fire for qualification or conduct mini-SQTs and ARTEPs. Often, the availability of vehicles is cross-checked with current deadline reports. Here, all levels of the chain of command find out what the unit can actually do. Performance-oriented evaluation of training does not ask:

- "Has the unit covered all mandatory subjects?"
- "Was training conducted when the training schedule said it would be?"
- "Did trainers rehearse?"

The question it does ask repeatedly is: "*Could the soldiers and unit do what they were expected to do?*"

This does not mean that training methods and training management are never checked under a performance-oriented evaluation program. If training managers want to find out why soldiers can't perform or how good results were achieved, they can "dig deeper" by focusing on *how the unit trains*. Also, a trainer may present inadequate training because of factors partially or completely beyond his control such as insufficient lead time for preparation, inadequate resources, excessive changes to plans and schedules, and unclear or incomplete training objectives or guidance. If training evaluators notice such problems, it may be appropriate to evaluate *training management* procedures; however, the main emphasis—the center of efforts by evaluators—should remain focused on performance.

Directing performance-oriented corrective actions

After an evaluation, evaluators should provide information to the commander of the unit being evaluated and to the chain of command. Based on this information, the commander should act to:

- Insure continued satisfactory performance, training, and/or training management practices.
- Correct unsatisfactory performance, training, and/or training management practices.

In formulating appropriate corrective actions, commanders and training officers should keep in mind the fact that performance results from a combination of factors:

- Skills and knowledge.
- Adequate training environment (resources, guidance, and freedom from distractions).
- Motivation.

If any of the three areas are deficient, performance will falter. On the other hand, a peak condition in one area can partially offset a shortfall in another. Most important, only a deficiency in skills/knowledge can be corrected by *training*.

A performance-oriented evaluation report will help a commander take the right performance-oriented corrective actions. Deficiencies in skills/knowledge, the training environment, or motivation can cause shortfalls in all three areas of training (performance, training methods, and training management). When evaluating any of these areas, evaluators should be trained and directed to observe and report on the reasons why any area is unsatisfactory; e.g. what caused the shortfall—deficiencies in skills/knowledge, the training environment, motivation, or a combination of these factors? One useful technique is to use a standard evaluation report form with spaces for each type of observation.

Commanders and their training management staffs should analyze the data received from evaluators and take appropriate actions:

• *Act to insure continued good performance, training, and/or training management.* Such actions usually take the form of rewarding outstanding achievement. The reward should be the minimum possible that will sustain the desired performance such as providing public recognition or time off to soldiers, writing positive efficiency reports or letters of congratulation for trainers' personnel files, or allowing training managers more freedom in doing their jobs. Whatever the reward, it must be perceived as worthy by the recipient. The frequency of such rewards should taper off as the level of performance rises. With adequate but not outstanding soldiers, trainers, or managers, commanders usually do not need to take any action. However, the decision not to act should be

deliberate, and not the result of overlooking or forgetting to act.

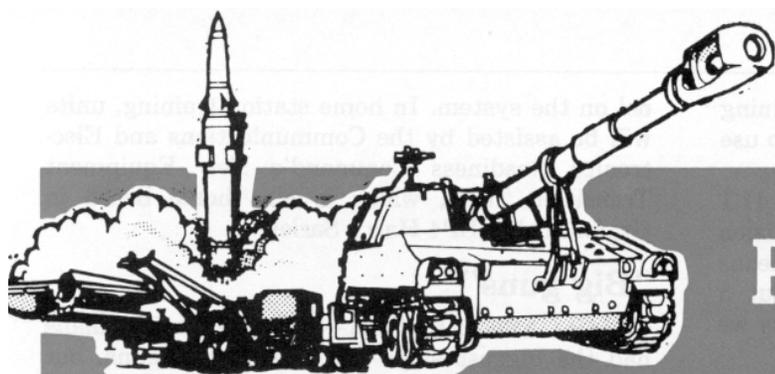
• *Act to correct unsatisfactory performance or training management practices.* Corrective actions do not have to be punitive; rather, they should simply supply whatever is required to deliver the desired performance. If a problem is caused by a *skill or knowledge* deficiency, more training is the right solution. At higher levels, this action may take the form of revising goals which, at battalion or separate company level, new training objectives may have to be developed or training programs established to train trainers. In many training situations, the evaluator can take corrective action during the evaluation or the critique to insure that incorrect learning does not take place.

Problems in the *training environment* may require a change in plans and priorities for resources. This change may result in programming or providing more fuel, funds, ammunition, land, or other training resources to a unit. It may also bring about needed improvements to facilities. Training managers may need to obtain clearer guidance from higher headquarters. Trainers may need more time or supervision. Evaluation may reveal that training can be improved by holding training managers responsible for training trainers.

Motivation is the responsibility of commanders. Before considering measures to reward good performers or penalize those which are substandard, a commander should take actions to remedy skill and knowledge and environmental problems. Other techniques to increase soldier motivation include challenging soldiers and promoting esprit, competition, effective communications, and training that are in line with the soldier's goals and values.

No leader or unit can deliver standard performance all the time. For good performance, the entire chain of command must work together as a team. Seen from that perspective, the supposed difference between "tests" and "evaluations" loses much of its significance. Performance/training standards are established, and units check frequently on how well they can perform. Based on that evaluation, appropriate corrective actions are taken. The final product will then be what commanders should be most interested in: **PERFORMANCE.** ☒

MAJ Dennis E. Coates is attending the Armed Forces Staff College in Norfolk, VA.



notes from the units

Right by Piece

TACFIRE tested

FORT RILEY, KS—The "Big Red One's" division artillery has spent the last several months preparing, training, and testing Redlegs to use the new TACFIRE system, which was fielded at Fort Riley in January this year.

In May, the entire division artillery held a field training exercise to validate their ability to use TACFIRE. They also participated in the division command post exercise, "Red Fire," using TACFIRE for live fire missions.

During the exercise, each of the battalions provided fire support in the normal division support configuration: the 1st Bn, 5th FA, was in direct support of the 1st Bde; the 1st Bn, 7th FA, was in direct support of the 2d Bde; and the 3d Bn, 6th FA, provided general support to the whole division sector.

The combined arms field training exercise put TACFIRE through several tough and demanding tests.

"Everyone did a typically outstanding job, which is the battalion and division standard," said CPT Bernard Ellis, C Battery Commander, 3d Bn, 6th FA.

"The reason the battalion did so well is because the NCOs did such an outstanding job," claimed Ellis.

"There was a lot of good training going on out here," said SG Henry Litt, section sergeant, Btry A, 3d Bn, 6th FA. "We've sent 71 rounds down range."

As missions were created by forward observers, channeled through the TACFIRE computers and on to each battery, the atmosphere in each section was charged with electricity and excitement.

Fire mission instructions received at the battery were relayed to the guns by intercom, and then repeated by each section gunner so that everyone could hear the type of round, fuze size of the propellant charge, and, most importantly, the command, "Fire!"

As tensions mounted, final adjustments were made, and the safety officer checked each artillery piece in his battery to insure that the mission was safe to fire.

When the command was given, all the guns roared in unison. Each of the crews knew that, besides the loss of

pride for being out of sync with everyone else, a case of beer is the fine for missing the beat.

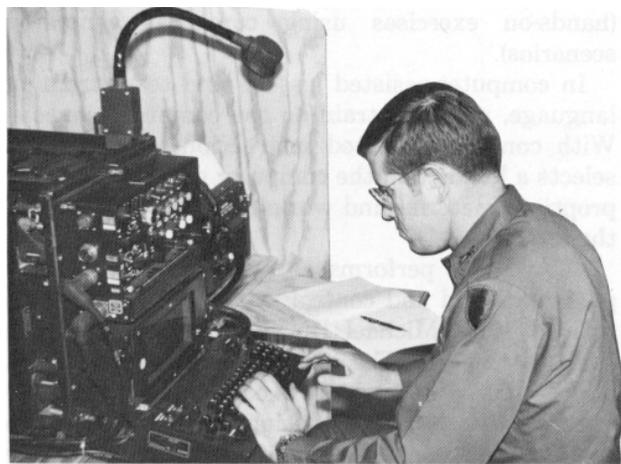
"A lot of young guys needed this kind of field experience to get to know what's going on out here," said SSG Johnny Kennedy, motor sergeant, Btry B, 3d Bn, 6th FA.

The new TACFIRE system marks the first time an Army unit in the field has had a real-time, computer-generated battle map, showing tactical boundaries and friendly and enemy locations.

TACFIRE training

GRAFENWOEHR, WEST GERMANY—Training on TACFIRE, the first major new artillery weapons system to be deployed in Europe in recent years began in Germany last March.

"We're not teaching these soldiers how to do their job; they already know that," says MAJ Gary W. Smith, Chief of the 7th Army Training



It's school time for USAREUR artillerymen. MAJ Michael Burns, 3d Battalion, 16th Field Artillery, works through a lesson at the 7th Army Training Command's TACFIRE Transition Training Division in Grafenwoehr. The 8th Infantry Division Artillery is the first unit in Europe to train on the computerized fire direction control system now being introduced in USAREUR. (Photo by SGT Rick Maleck)

Command's TACFIRE Transition Training Division. What we are teaching them is how to use TACFIRE to do their job better."

"TACFIRE does great things for us," says 1LT Damian Wackerman, HHB, 8th Infantry Division Artillery, "It helps us do our job faster. That means not only quicker reaction to a situation, but a significant increase in the number of missions we can perform in a given time."

To learn to use TACFIRE, artillery officers and senior noncommissioned officers (NCOs) train on four basic pieces of equipment: the TACFIRE computer, located at fire direction centers (FDCs); the Variable Format Message Entry Device (VFMED), located at the battalion, brigade, and division fire support elements; the Digital Message Device (DMD), issued to observers; and the Battery Display Unit (BDU), located at the firing batteries.

"TACFIRE encompasses every operational aspect of the fire direction center. It's fast and it's capable of handling 30 fire control missions at the same time," says SP4 Robert Weston, an operations specialist for the 8th Infantry Division Artillery.

Training at Grafenwoehr is conducted in three courses:

- The Fire Support Course which is for key NCOs and officers who work in division artillery or battalion fire direction centers.

- The Fire Support Element Course.

- The Tactical Operations Center Course.

Instructional media include audio-visual lessons, programed texts, job performance lessons (basically programed texts with a hands-on exercise), computer assisted lessons, and team training language (hands-on exercises using computer generated scenarios).

In computer-assisted lessons and team training language, students train on the computer console. With computer-assisted instructions, the student selects a lesson and the computer generates the appropriate material and works the student through the lesson.

"TACFIRE performs all functions of the FDC, plus command and control at the same time," explained MAJ Michael Burns, 3d Battalion, 16th Field Artillery. "The system is complex, but it makes sense and therefore is easy to learn. I'm taking the self-paced course using the VFMED in the instructional mode. The machine is teaching me how to use it. I'm learning at my own speed; when I finish a subject the machine passes me and then I proceed to the next subject."

The Grafenwoehr courses are just one phase of TACFIRE training. Phase two begins when soldiers return to their own unit to train with other personnel on

the system. In home station training, units will be assisted by the Communications and Electronics Readiness Command's New Equipment Transition Team, which is also home based in Grafenwoehr. (SP4 Harry Sarles)

"Big guns"

CAMP CASEY, KOREA—"In 1941, the Germans had the biggest ships and the biggest guns, but we've got the big guns now," said 1LT Craig Bowerman, Alfa Battery, 2d Battalion, 17th Field Artillery. "We can hit targets 20 miles away."

The big guns Bowerman is talking about are four recently arrived M198 howitzers which dwarf anything ever seen in Korea. They give US Forces greater firepower and greater range which Bowerman and his men proved when the big guns were recently test-fired for the first time in Korea.

It takes an 11-man crew to operate the M198s and, when trained, they can fire two to four rounds a minute. The guns can fire 18 different types of rounds, including the rocket-assisted Copperhead projectile. The Copperhead, when primed with a full charge, flies miles downrange as fast as a rocket.

The big guns weight 15,500 pounds each and, when primed with a max charge of "Super 8" explosives, the gun will recoil 65 inches. That's almost five and one-half feet!

More training is planned for the men of the 2d Battalion, 17th Field Artillery. But, they want the training, even though it means field duty, mud, and rain. Their job is to protect and defend South Korea. And the men of the 2d Battalion, 17th Field Artillery have the big guns to do it with. All they need to hear is, "Fire Mission, front!" (SSG Bob Hubbert)



Man and machine—they're both important to the defense of South Korea. (Photo by SP5 David Polewski)

"Speedball"

CAMP CASEY, KOREA—Once the Warriors of Firebase 4-PAPA-1 receive the code word "speedball," they have only minutes to get 105-mm artillery rounds downrange. Immediately, a siren will blast a long, high-pitched sound across the compound.

One sunny day in April, the firebase phone rang and the short and electrifying message was "speedball." Some of the soldiers were in the shower while others were cleaning weapons or sleeping after all-night duty. The clerks in the orderly room were working on status reports. The wail of the siren brought them all to their feet. The doors of the offices and showers flung open. Speedball had begun.



Quadrant, deflection, and other information comes quickly, but precisely, and the gun tubes slowly begin to rise. (Photo by SP5 David Polewski)

The commander of Battery B, 1st Battalion, 15th Field Artillery, 2d Infantry Division, was the first man out the door. He was followed closely by the unit armorer. Within seconds, the arms room was open and rifles were ready for issue. The fire control direction chief passed the arms room clad in only a towel. He lost the towel halfway to his bunker, but dripping wet he continued to run forward.

The crews of the 105-mm howitzers appeared at the 10-second mark. Most went right to their assigned bunkers. Some went to the arms room to draw M16s. The fire control center sent range and deflection information to waiting crews. The gun tubes began to rise; 40 seconds into Speedball, and everyone was where they were supposed to be.

The crew chief of gun number one shouted, "On my command!" He raised his hand and listened to the voice on his headset. "Fire," he shouted, and the first round was on the way. Speedball was 90 seconds old.



"No time to waste; gotta run, gotta run." (Photo by SP5 David Polewski)

The enemy downrange would have already been feeling the force and power of the American military weapons. The barrage from the guns would continue until crews heard the words, "Terminate exercise." Then, and only then, could the men on 4-PAPA-1 relax. The lieutenant could get dressed, the clerks could type, and tired soldiers could sleep.

Speedball is a common training exercise for all mortar and howitzer crews stationed on the demilitarized zone (DMZ). Crews at Camp Liberty Bell, Warrior Base, Camp Stanley, and other DMZ locations all practice this quick-fire mission. Although they know that speedball drills are "no-load status" missions, they never know when the mission might be real. They take no chances. Lives, American and Korean, depend on their actions and reactions. (SSG Bob Hubbert)

Drill Sergeant of Year

FORT SILL, OK—The Fort Sill Drill Sergeant of the Year is a volunteer all the way. After voluntarily enlisting in the Army, he volunteered for two tours in Vietnam and for two assignments as a drill sergeant.

SFC John M. Poole, the senior drill sergeant in B Battery, 6th Training Battalion, Field Artillery Training Center, volunteers because he likes to be where the action is.

"I volunteered to go to Vietnam the first time and the second time I wanted to go back because Vietnam was where everything was happening," he noted. He became a drill sergeant, for the same reason.

He spent his first assignment as a drill sergeant at Fort Dix from 1971 to 1974. Fifteen months ago he volunteered again at Fort Sill. "The working conditions are better here," he said, "but working with trainees, like we did at Dix, was better than having to work under the one-station unit training (OSUT) concept." He explained this further, saying new trainees are sometimes mixed with older soldiers and this can hinder training.

Even so, he still wishes drill sergeants could stay on status for longer than three years, "It's one job where you have the opportunity to see the results of your work. You start with civilians and mold them into soldiers."

Generally, Poole says, there are three types of trainees. "There are those who can go through easily, there are some who work to death and still have trouble, and there are the ones who work well and do well. Drill sergeants like to have the ones who are putting forth effort."

The 15-year Army veteran was born in Texas but calls New Orleans home. He grew up in several towns in Texas, Louisiana, and Mississippi. He met his wife when she wrote him a letter while he was in Vietnam. She had read about him in the New Orleans paper (PFC Brian Tevington)



Fort Sill Drill Sergeant of The Year SFC John M. Poole, B Battery, 6th Training Battalion, wishes drill sergeants could stay on status for more than three years. Poole will now compete for the TRADOC Drill Sergeant of the Year title. (Photo by PFC Brian Tevington)



Nighttime in the desert.

Field artillery lights up Las Vegas sky

LAS VEGAS, NV—Out of the desert of southern Nevada in an area desolate as the old West itself in the dead of night—the air crisp and clear—comes a startling beam of light, cutting through the night like a needle.

Another beam shoots through the night and then another. Like giant lasers with golden threads in the dark with the intensity of two billion candles, an atmosphere of science fiction exists.

But no, it's only Battery D, 29th Field Artillery—known to many as the vampires of the Artillery.

Battery D is nestled quietly among the natives of Las Vegas, NV—known for its bright lights and wild night life.

The battery has white light and an infrared capability and can light up a newspaper 10 miles away or, if needed, illuminate an entire battlefield.

The battery, which has been in Las Vegas since 23 January 1963, served in World War II in Normandy, Ardennes, Rhineland, and Central Europe. The unit was awarded the Presidential Citation and the Belgian Fourragere twice. The 29th Field Artillery shares honors with three Presidential Citations for Vietnam, along with two Meritorious Unit Citations and a unit award for valor.

By her fourth birthday she was put into Regular Army service with the 4th Division. And now on her 63rd birthday with the 63rd ARCOM she is destined for retirement. The best to be said for all is "Hail and Farewell" to a real Lady of Artillery. (SSG Michael Parker)

Scorpion

FORT BENNING, GA—The Eagles of A Battery, 2d Battalion, 10th Field Artillery (Fort Benning's only field artillery battalion), recently conducted a comprehensive one-day field training exercise (FTX), called "Scorpion," which combined many field artillery skills and Army readiness tasks.

The morning began with spirited battery competition in direct firing at Redcloud Range. All gun sections did well, particularly the 6th howitzer section which hit the target (an old M113 armored personnel carrier) 10 out of 10 times.

The APC was just 700 meters down range during this direct fire shoot, barely out of the danger close 600-meter range. "It's not often we get a chance to see where our rounds land," said SP4 Joe Williamson, "and, besides that, blasting the target to pieces is fun."

The battery's busy day continued as they packed up and headed for another firing point. En route, they received a call for fire, and a hipshoot was conducted to determine whether they could fire for effect within the 11-minute Army Readiness Standard. They did.

For the final exercise—a consolidated shoot—battery elements were brought together so that forward observers, FDC personnel, and howitzer



Eagle crewman prepares for firing.

crewmembers could see just what the rest of the "guys" had to do to put steel on the target. (CPT Daniel J. Swacina)

Survey cadre praise PADS' performance

FORT SILL, OK—"Working the system an average of seven hours a day for 17 days proved beyond any reasonable doubt...the survivability of PADS...." Thus reported two Fort Sill, OK, artillery NCOs who recently put the Position and Azimuth Determining System (PADS) through its paces in the rugged terrain of Fort Irwin, CA.

SFC Roland Chaput and SFC James L. Turnbow, instructors at the Army Field Artillery School, relentlessly drove the jeep-mounted PADS over 450 miles of sand and rocky hills in California's hot, arid High Desert. Their mission was to establish 1,250 survey control points for a combined arms training exercise course at the National Training Center. They estimate the same survey would have taken a conventional party 105 days under ideal conditions. "This would be like surveying from Fort Sill, OK, to San Antonio, TX, placing a firing point every 0.4 mile," Chaput elaborated.

The self-contained, all-weather automated inertial survey system was still operating after three jeeps succumbed to the brutal climate and terrain. After each breakdown, the PADS was transferred from the disabled vehicle to an operational one in less than an hour by two soldiers.

The PADS was again called on to survey proposed compass and land navigation training courses in wooded areas of Fort Chaffee, AR, where survey reconnaissance took two days. A first-order survey point was recovered for an observation post on Pinnacle Mountain, and three days were spent marking the new points to be surveyed.

The job of establishing 34 survey stations along a 56-mile traverse was finished in six hours. The End of Project Report states, "It was estimated that a minimum of three weeks would have been required to accomplish this task by conventional surveying."

The PADS may be used for other military post surveys in the future. In the meantime, the Field Artillery School's Counterfire Department is working on a program of instruction to teach field artillery surveyors (MOS 82C) how to use PADS.

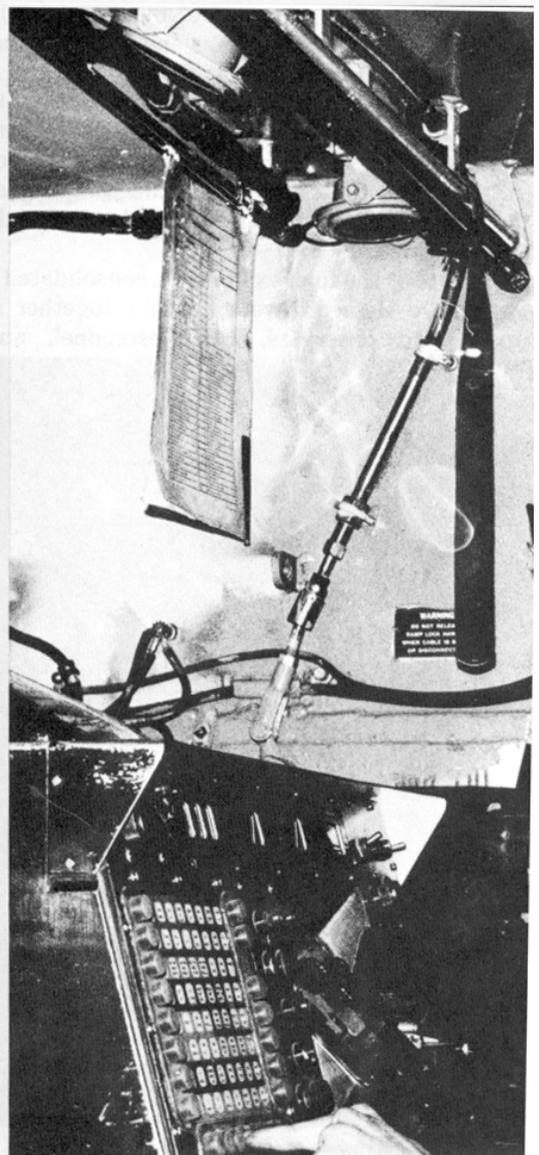
Correction

On page 47 of the May-June 1981 *Journal*, the caption under the photo in the right column states that the M198 weighs only 4,850 pounds. Actually, the M198 weighs 15,500 pounds.

The section chief can be given an excellent picture of just how good his section can perform.

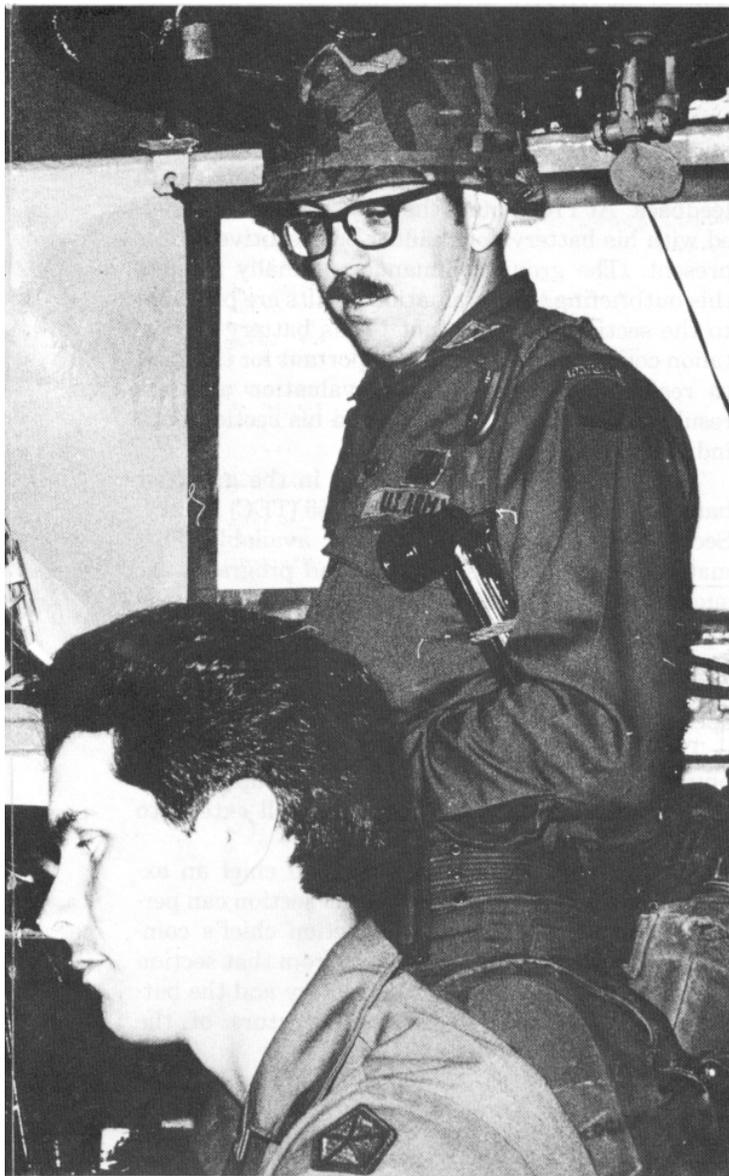
Completing the Readiness Picture

by CPT Bruce A. Brant



Each year, field artillery battalions and batteries participate in a myriad of evaluations such as AGIs, ARTEPs, TVIs, and other readiness exercises. Through these evaluations, the commander can obtain a reasonable estimate of how his unit measures up to the standards required for combat readiness.

But what about the individual sections within the battery? How do they fit into the overall readiness picture? Can one weak section make the difference between a good and a mediocre battery? How important is it to the individual soldier to be a member of a "good" section as far as personal development?



To answer these and other questions, COL August M. Cianciolo, Commander, 41st Field Artillery Group, asked that a system be developed to gage the training level and overall standards of sections within the 41st FA Group. Specifically, he wanted to evaluate individual sections to determine how well section chiefs were training their soldiers to operate in both peacetime and simulated combat environments.

With this command guidance, the 41st Field Artillery Group S3 Section put together a totally comprehensive section evaluation. Thus, if a section was below standards in any area such as training, supply, or maintenance, the group evaluation team could identify the problems to the section chief and direct him to the correct solutions.

Several division artilleries, brigades, and groups have their own section evaluations, but the 41st Field Artillery Group's evaluation is different because it focuses on those tasks for which the section chief is responsible. In other words, all facets of the section chief's responsibilities are evaluated using the following scenario:

- 0530—The section to be evaluated is identified to the battalion.
- 0830—The section reports to the battalion classroom for an inbriefing conducted by the evaluation team.
- 0845-1100—Simulated Skill Qualification Test (SQT). While the section is taking a written exam, the section chief and evaluators inspect:
 - 1) Section vehicles.
 - 2) Section living areas.
 - 3) Section storage areas.
 - 4) Section supply records.
 - 5) Section maintenance records.
- 1100—The section chief returns to the battalion classroom to take the Group Safety NCO test.
- 1300—Section reports to the local training area with all TOE and individual TA-50 equipment required for deployment.
- 1305—"Hands-on" SQT is administered to the section while the evaluation team inspects:
 - 1) Individual and crew-served weapons.
 - 2) Individual clothing and equipment.
 - 3) Nuclear, biological, chemical (NBC) equipment.
 - 4) Section equipment.
- 1500—Section ARTEP tasks administered to entire section.
- 1700—Outbriefing.

Evaluations

The written evaluation helps prepare each individual for the written portion of the SQT by providing

questions which closely resemble those on the actual test. (Several of the questions are derived from the SQT notice for that particular MOS.) The evaluation consists of three parts: Common skills, MOS, and NBC.

The results of the section's written portion and Group Safety NCO test, taken by the chief, are averaged together and are worth 15 percent of the total score.

The SQT "hands-on" component has two portions: Common skills and MOS. Each area includes five tasks and the average of these evaluations is also worth 15 percent.

Maintenance is evaluated in two separate areas (vehicles and generators) and is worth 15 percent. Maintenance records are also inspected and this is worth 5 percent. Although most of these records are filled out by The Army Maintenance Management System (TAMMS) clerk (with the exception of DA Forms 2404 and 2408-4), the section chief should be responsible for reviewing his records and, when appropriate, point out any deficiencies noted to the motor sergeant.

Supply records are also inspected and are worth 5 percent. Here again, it is felt that the section chief should insure that all hand receipts and individual clothing records are correct. By doing this, the chief will know which soldiers are short TA-50 items and will be able to keep better control of his equipment.

Both individual and crew-served weapons are inspected, to include all accessories from tripods to the head-space and timing gage. The weapons inspection is worth another 5 percent.

Worth 20 percent are the collective areas, which include an inspection of TA-50 items, storage areas, living areas, section equipment, NBC equipment, and a subjective evaluation by the chief evaluator.

The TA-50 inspection takes place in the field. All clothing and equipment needed to sustain the individual in combat must be present. Not only is the equipment inspected for cleanliness, but also for completeness. The soldier must have his complete readiness uniform to include extra boots, clothing, and toilet articles.

Section equipment and the storage area are inspected for cleanliness, completeness, operability and safety hazards. This also gives the evaluation team an opportunity to check on accountability of equipment and insure that inventories and supply actions are taking place.

Section living areas and wall lockers are inspected for cleanliness, safety, and energy conservation, and the soldiers initial clothing issue is inventoried.

Because of the NBC capabilities of threat forces, this area is highly stressed in Europe. In addition to the

special written test, at least two of the common skills hands-on component tasks are NBC related and all section equipment is inspected to include protective masks, resuscitation tubes, M8 detection paper, waterproof bags, M258 kits, M13 kits, NBC protection suits and overboots, and the section's M11 decontamination apparatus.

The final portion of the collective areas is the chief evaluator's subjective evaluation which includes the appearance, attitude, and enthusiasm of the troops; promptness of the section (in the right place at the appointed time); safety; and any area not already covered (such as a section chief who is especially knowledgeable of his section personnel).

The last event in the evaluation, worth 20 percent, is the ARTEP tasks portion. The section chief is given a scenario involving a deliberate occupation and position improvement where several tasks are graded simultaneously. The final task for 13Bs in this area is to carry out procedures associated with misfires.

An important part of the evaluation is immediate feedback. At 1700 hours, the section chief is debriefed with his battery commander or executive officer present. (The group commander normally attends this outbriefing.) All evaluation results are provided to the section chief, but not to his battery or battalion commander. Here, it is important for the chief to realize that this was *his* evaluation and the results reflect how well *he* trained his section both individually and as a team.

The outbriefings are conducted in the group or battalion Training Extension Course (TEC) library. Section chiefs not familiar with available TEC material are given a short tour and programs are suggested that will help in areas requiring improvement. Where appropriate, the evaluation team also suggests methods to better train a section and provides copies of all tests and results of all areas inspected.

To date, only 13B and 13E sections have had the opportunity to participate in the Group Section Evaluation Program; however, this will extend to other MOSs in the future.

These evaluations give the section chief an excellent picture of just how good his section can perform. Just as important, the section chief's commander knows what he can expect from that section and how important it is to the battery and the battalion. He now has a complete picture of the readiness posture of his unit. 

CPT Bruce A. Brant, formerly the 41st Field Artillery Group Assistant S3, is now commanding B Battery, 2d Battalion, 5th Field Artillery.

REDLEG

NEWSLETTER

Join the Guard and go to college

The Army National Guard is offering a new scholarship program that provides ROTC scholarships to selected students who will then serve in the Army National Guard (ARNG) after graduation. The program is called the Army National Guard Reserve Forces Duty Reserve Officers Training Corps (ARNG-RFD-ROTC) Scholarship Program. Although the program will be ongoing, its success in the first year will be a major factor in determining the number of scholarships allocated to the ARNG in the future.

Under this program, the ARNG will award one two-year ROTC scholarship to each state, territory, and the District of Columbia. Each state may nominate a primary candidate and three alternates. If, for reasons of disqualification or declination, no candidate is selected from a particular state, the scholarship will be awarded to the most qualified alternate nationwide. Scholarship recipients must attend an ROTC institution within the state from which nominated, with the exception of the Virgin Islands, which may nominate individuals who will attend an ROTC institution in another state.

Possible candidates for these scholarships are student leaders on campus as well as members of the ARNG who attend college and desire to become commissioned officers in the Guard.

The scholarship provides tuition, related academic expenses, and a subsistence allowance for the final two years of the recipient's college career. To become eligible for the scholarship, the student must satisfactorily complete two years of a college academic course (with a minimum grade point average at time of application of 2.7 on a scale of 4.0), become qualified for entry into advanced ROTC, and successfully pass the Physical Aptitude Exam administered by the ROTC detachment.

Other factors determining eligibility are that the student be at least 17 years of age at the time of enrollment as a scholarship cadet and under 25 years of age on June 30 of the year in which eligible for appointment. Another requirement is that the scholarship recipient enlist in the ARNG for six years or

have, at minimum, a remainder of four years on his or her enlistment obligation, or the individual may extend enlistment in order to qualify. Upon graduation, the cadet will serve with the ARNG in lieu of active duty.

Individuals interested in receiving an ARNG-RFD-ROTC scholarship should contact the Professor of Military Science at the ROTC institution they are attending or the State personnel officer. Winners of the 1981 scholarships were announced in June this year.

USAR medical care policy on training injuries

Not understanding health care policies can cost on-duty Army Reservists thousands of dollars and as many hours of perspiration.

Take the recent case of an Army Reservist who fell off a truck and injured a knee during drill. Accepting the word of his supervisor and his company commander that all his medical costs would be paid for, the Reservist consulted a civilian orthopedic specialist to the tune of \$2,600 worth of therapy.

Unfortunately for this unlucky Reservist, the \$2,600 had to come out of his own pocket. Neither he nor his supervisor nor his company commander understood the provisions of AR 40-3. For the Reservist, it proved to be an unnecessarily expensive lesson. To avoid this pitfall, Army Reservists should check AR 135-200 because medical benefits differ depending on the Reservist's duty status.

Reservists injured in the line of duty or who get sick during active- or inactive-duty training should tell their unit and seek care in a military facility as soon as possible. The first step is to have DA Form 2173 (Statement of Medical Examination and Duty Status) filled out by your unit commander and by the attending physician or hospital registrar. Failure to do this could severely hamper any future efforts to be reimbursed or scheduled for medical attention. Once the form is completed, it's up to your unit commander to see to it that you're placed in the proper pay status and receive disability pay or whatever allowances may apply.

GI Bill benefits change

For soldiers who enlisted prior to 1977, the GI Bill has changed in three important ways.

First of all, benefit payments increased. The basic minimum allowance is now \$342.00. Second, money and time spent pursuing a high school diploma or equivalency certificate will no longer be charged against any entitlement. Finally, educational assistance that applies to reimbursement rates for correspondence and flight training have been reduced.

On this last point, soldiers who entered training in September 1980 will get a 90 percent reimbursement rate for that month only. Those who entered training after September will get 70 percent for correspondence and 60 percent for flight training courses.

In addition to these changes, soldiers having Veterans Administration (VA) entitlements under two or more programs are now limited to 48 months. This includes any prior VA entitlements, such as dependents educational assistance. For instance, if a soldier received 36 months of training under the dependents educational assistance program, he or she would be eligible for not more than another 12 months of GI Bill or VEAP (Veterans Educational Assistance Program) entitlement.

For more details on these changes, soldiers should visit their installation Education Services Officer (ESO).

Military awards changes on tap

Peacetime military awards, an area cited by the Army Cohesion and Stability Team (ARCOST) as a factor in promoting continued Army service, will soon be available. The new awards would recognize soldiers' contributions to the Army during peacetime.

The changes which will be outlined in an updated version of the military awards regulation (AR 672-5-1), include —

- Creation of the Army Achievement Medal.
- Service ribbons for Army service, overseas service, and NCO academy completion.
- Authorization to wear one foreign badge/patch per individual.
- Authorization for all state adjutants general, regardless of service, to approve meritorious service and Army Commendation Medals for Army National Guard members of that state.

The Army Achievement Medal will be awarded to service members to recognize important achievements not considered as qualifying for the Army

Commendation Medal but deserving of special recognition. The achievement medal will be worn after the Army Commendation Medal and before the Purple Heart on the Army dress uniforms.

Completion of a normal overseas tour in a peacetime environment will allow service members to be awarded the Overseas Service Ribbon, and numerals will be used to show completion of other overseas tours.

Both officers and enlisted soldiers will be awarded the Army Service Ribbon on completion of the initial MOS or basic course (awarded one time only).

The NCO Academy Ribbon will be awarded to enlisted soldiers upon completion of each level of the noncommissioned officer education system. Subsequent awards will be shown by an Oak Leaf Cluster.

The wearing of the foreign badges, to include qualification and special skill badges and patches, is authorized for permanent wear by the individual, but an individual will be able to wear only one badge or patch on a permanent basis; also, the foreign badge or patch must have been earned after 1 September 1975.

The new medals and ribbons, which will be authorized for awarding to all qualified Active Army, Army National Guard, and Army Reserve soldiers, are expected to be available in post exchanges in 10 to 12 months and through the Army Supply System in approximately 22 months.

Permanent change of station advance pay

Pay advances can be of great help to servicemembers with permanent change of station orders. The US Army Finance and Accounting Center has distributed a question and answer sheet to assist soldiers and commanders in understanding the purpose, limitations, and payback requirements of an advance.

An advance of up to a maximum of three months' base pay is authorized in connection with helping to defray extraordinary PCS expenses. The advance is then collected from the soldier's pay over a 6- or (in certain cases) a 12-month period following the PCS move.

Army policy restricts the payment of advances to no more than one month's base pay at the old station and two months' pay at the new station. If no advance is received at the old station, the soldier can receive one month's base pay while en route or up to three months' advance at the new station.

This policy was developed to insure that soldiers get the advance pay at the point of need. There are no exceptions to this policy.

Warrant officer flight training regulation revised

Army Regulation 611-85, entitled "Aviation Warrant Officer Training" was issued on 1 February 1981. The new regulation updates policies affecting enlisted applicants, to include aptitude scores, service obligations, and interservice transfer of Sailors, Marines, Airmen, and Coastguardsmen to attend flight training. An applicant must meet class 1 flight physical standards and active service criteria. Minimum qualifying score on the flight aptitude selection test-warrant officer candidate battery (FAST-WOCB) is 300, or 90 on the revised FAST, with one retest permitted no earlier than six months following original testing.

Reenlistment bonuses

Thousands of mid-career soldiers with six to 10 years of service became eligible for reenlistment bonuses on 1 October last year. Over 60 new military occupational specialties (MOS) were added to Zone B of the Selective Reenlistment Bonus (SRB) Program. Most of the MOSs are in the combat arms career fields. The few combat arms MOSs not previously designated for Zone A SRB in FY80 were also added to the SRB program on 1 October. Zone A includes soldiers who reenlist between 21 months and six years' active service, while Zone B includes those soldiers who reenlist between six and 10 years of active service.

As a result of new legislation, bonuses also became available for soldiers in selected skills who have between 10 and 14 years of service. The Army's FY81 Zone C Program will permit about 400 highly skilled linguists and other technicians to reenlist and receive a bonus in FY81. In the past, there were provisions for bonuses only in Zones A and B. Also, as a result of recent legislation, the maximum authorized payment for the SRB Program was increased from \$12,000 to \$16,000, and the maximum years of service for bonus computation was extended from 12 to 16 years. Thus, soldiers in Zone B may now reenlist for up to six years and receive a bonus based on the total additional obligated service. In the past, a soldier with nine years' service who reenlisted for six years at ETS could only be paid a bonus based on three more years of service rather than the full six years. Example: an Infantry staff sergeant can now reenlist and receive a lump sum Zone B bonus of about \$5,500. Prior to 1 October 1980, a bonus was not available for MOS 11B (Infantryman). Had one been available then, the same soldiers would have received only about \$2,400 under the pay scales then in effect. Additional

information on bonuses may be obtained from local reenlistment NCOs.

Assignment policy change

In a major policy change, which became effective 1 December 1980, commanders and supervisors will be given an expanded role in informing subordinate officers of forthcoming reassignments.

MILPERCEN action officers recommended the change in procedure after tests in units at Forts Riley, Benning, and Meade.

The new procedure will apply to all warrant officers and commissioned officers through the rank of major. Initially, only officers who are assigned in the continental United States (CONUS) will be involved; however, plans to include overseas units are scheduled for implementation in July this year.

Coordination of assignment information such as location, specialty, and reporting date will take place between the officer, his commander or supervisor, and his MILPERCEN assignment officer.

The assignment officers will call a designated point of contact (POC) at each post or installation — usually within the G1 office of the Directorate for Personnel and Community Activities (DPCA) — and inform that person of the officers who are scheduled for permanent change of station (PCS) moves. The POC will be given the name of each officer, his social security number, the date being considered, the utilization specialty, the location, and the name and telephone number of the assignment officer involved.

This information will be provided to the appropriate commander or supervisor for his use in making the announcement to the officer concerned. If the commander or supervisor elects to do so, he may call the assignment officer before, during, or after the counseling period for further information. He is expected to make the announcement to the officer within three working days of the date on which the alert notification is made to the post or installation.

The assignment officer will be prepared to discuss with the commander or supervisor, or with the officer, the rationale for the assignment, the officer's professional development requirements, and the needs of the Army. The officer's performance information will not be made available to his commander or supervisor unless he gives his approval to release that information.

If the assignment officer doesn't hear from either the commander or supervisor or from the officer within three days, he will prepare a request for orders and complete the assignment process.

Enlisted Records and Evaluation Center

The US Army Enlisted Records and Evaluation Center initiates, maintains, and services the Official Military Personnel File (OMPF) of all enlisted personnel on active duty with the US Army. The OMPF is maintained in microfiche mode for over 600,000 enlisted members. The Center operates the US Army Deserter Information Point (USADIP) and a terminal of the FBI's Regional Crime Information Center. USADIP maintains the records of all known Army deserters and assists law enforcement agencies in apprehension efforts. In addition, the Center provides the Department of the Army, field commanders, and individual soldiers with timely evaluation of the soldier's performance as reflected on the Enlisted Evaluation Reports and the Skill Qualification Tests when applicable. Other services provided by EREC include:

- Worldwide locator service for both officers and enlisted personnel.
- Administrative and logistical support to Department of the Army enlisted selection boards.
- Enlisted Evaluation Report Appeals Program.
- A records review facility for soldiers who travel to Fort Benjamin Harrison to review their OMPF personally.

Stabilized tour lengths

An effort is currently underway to improve the turnaround time between overseas tours for all soldiers by reducing the number and length of stabilized tours in the Continental United States (CONUS). A study by the Army Cohesion and Stability Team (ARCOST) has determined it, if the length of stabilization for CONUS organizations was not more than 24 months, a significant improvement in the turnaround time for all Army members between overseas tours would be achieved.

The Army staff is receiving input from major commands (MACOMS) on the effects such a change would have on unit performance, cohesion, and other mission-related activities. Also, the MACOMS have been directed to rejustify the present stabilization policies listed in AR 614-5 with the knowledge that Department of the Army is looking at making 24 months the guaranteed period for enlisted soldiers. Eventually, the Army wants to allow soldiers to spend at least three years in CONUS between overseas tours.

This reduction in the stabilized period does not mean that all enlisted soldiers will move after 24 months. What it does mean is that, if an Army requirement exists, and a soldier is assigned to a stabilized unit or position,

he or she may be moved after 24 months on station. This should increase the pool of soldiers available and ultimately serve to increase the turnaround time for all soldiers.

There are three types of stabilizations covered by the basic regulation:

- Units/agencies/activities.
- Selected TDA/TOE positions.
- Name cases approved for special study groups or the like.

Only the stabilizations under the units/agencies/activities and the selected positions categories are being looked at for possible elimination or reduction of the stabilization period.

The elimination of or reduction in CONUS stabilized tours will impact significantly on those enlisted specialties which are critical to the Army today and which have a shortage of trained personnel to fill existing needs.

Stabilized tours for command sergeants major and first sergeants will remain the same. The length of stabilized tours for officers is being decided separately.

Stabilizations approved for contractual commitments (enlistment/reenlistment contract guarantees) and for compassionate reasons are not being considered for tour length changes.

Extra pay for extra duty

A Department of the Army proposal, currently under consideration, recommends that Reserve Component units be authorized Individual Administrative Periods (IAP) to provide compensation for extra hours. Reservists now spend on administrative work at their units. Under the concept, Reservists performing additional administrative duty would be given one day's pay and one retirement point for each four-hour block of time they worked.

Although the IAP program is only in the proposal stage, officials believe that approval would provide a long-overdue method for compensating Reserve unit members who must work beyond normal drill periods to complete administrative tasks. If approved, the IAP program would be an expansion of the Administrative Training Assembly (ATA) program, which is now used to allow key training officers and noncommissioned officers more paid time to adequately prepare for unit training assemblies. According to Department of Defense directives, "Additional training assemblies may be used for the preparation of training programs, lesson plans, training aids for training rehearsals, and unit training administration in order to provide the maximum training during each inactive duty training period."

Cohesion, Operational Readiness, and Training (COHORT)

Official reference to a pilot unit rotation program is now known as Project COHORT. The acronym stands for Cohesion, Operational Readiness, and Training.

Asked to comment on the plan to rotate units rather than individuals, General E. C. Meyer, Army Chief of Staff, told members of the Senate Committee on Armed Services last February:

"The biggest obstacle to readiness is turbulence. That means that in a tank crew, for example, only one or two soldiers stay with that crew for any reasonable time. In our squads, the situation is the same. In fact, our divisions turn over once every 18 months at the present time. That means that 18 months is as long as the individuals in the division stay together. This problem is due primarily to the fact that we have 43 percent of our force overseas."

General Meyer said the Army will bring individuals in and assign them to a company where they will remain for the full term of their enlistment.

The first unit under Project COHORT became a reality March 25 at Fort Knox, KY, when 61 tankers began a three-year period of training and service together. Eighteen more companies will be formed by February 1982.

General Meyer, in response to a question concerning the British experience with the unit rotation, replied:

"The British have always had a unit rotation system. They have rotated battalions in and out around the world. Of course, that is what built their cohesion and unity."

The Army Chief of Staff added:

"All of the studies after World War II indicated that if you wanted to increase the combat capability of forces, the best way to do it was to keep people together. So, we are in the process of changing the whole way we do business in the US Army. We have been an individual system. We will go to a unit system. It is a major wrenching to the way we have done business in the past."

Project COHORT units will take basic, AIT, and unit training together. After required CONUS stabilization, selected companies will rotate overseas as a unit.

Conversion of automobiles for overseas operation

Recent inquiries by the Department of Defense asked US automobile manufacturers to provide confirmation of those 1981 automobiles that could *not* be reasonably

converted for operation overseas on leaded fuel. As such, the following information has been provided by the General Motors (GM) Corporation and Ford Motor Company.

GM: Testing has shown that 1981 models which have been certified for sale in the United States may be converted to operate on leaded fuels available in overseas areas. As with previous model years, the 1981 models equipped with the Computer Command Control System will operate on leaded fuels without any significant effect on performance, provided certain precautions are taken. Prior to shipping US—certified 1981 GM vehicles overseas, the catalytic converter must be drained. Upon re-entry to the US, the catalytic converter or its pellets must be reinstalled. In addition, a new component in the Computer Command Control System, an exhaust oxygen sensor, may require replacement due to contamination by the use of leaded fuels. Contamination is not expected to cause operability problems but, if replacement is necessary, the current approximate cost of the oxygen sensor is \$50.00.

FORD: With the exception of a few automobile/engine combinations, most vehicles purchased and subsequently shipped overseas are receptive to leaded gasoline usage after minor adjustments. They can then be converted back for use with unleaded gasoline to meet US EPA Standards. All vehicles except those equipped with the 2.3-liter US-certified engine and the 5.0-liter US-certified engine in the Lincoln and Mark VI can be converted. For most engines, the catalytic converter must be deactivated and a bypass pipe installed. In the Ford LTD and Mercury Marquis with the 4.2-, 5.0-, or 5.8-liter engines, both main converters, and possibly a smaller "light off" converter, must be removed, the fuel filler neck must be changed to accommodate the larger fuel nozzle of leaded fuel pumps, and a stepper motor must be removed from the carburetor and replaced with a plug. Ford expects to have a modification program approved for the 2.3-liter engine and the 5.0-liter engine in the Lincoln and Mark VI prior to the end of the 1981 model year.

Both GM and Ford advise that export models sold exclusively for overseas delivery *cannot be converted for use on unleaded fuels nor can they be returned to the United States.*

Service members contemplating purchase of a 1981 automobile should determine the exact modification procedure from the automobile dealer concerned.

Partnership

by MAJ Michael A. Konopka

A relationship usually involving close cooperation between parties having specified and joint rights and responsibilities.



We are all very aware of Webster's definition of partnership when associated with a program in Germany, but what about a partnership effort between an active duty division artillery and a National Guard artillery battalion? Such a partnership is ongoing between the 5th Infantry Division (Mechanized), stationed at Fort Polk, LA, and the 256th Infantry Brigade (Mechanized), a Louisiana National Guard (LAARNG) unit. The 5th Infantry Division is a "roundout" division, one of four such active duty organizations. A "roundout" division has only two of its three organic brigades on active duty; when needed, the third brigade would be activated from an affiliated Reserve Component. The 256th has been designated as the 5th Infantry Division's "roundout" unit and, as a result of this relationship, in 1979 a special training program was initiated between the 256th Infantry Brigade and elements of the 5th Infantry Division.

The 5th Infantry Division Artillery's counterpart in this training program is the 1st Battalion, 141st Field Artillery (155-mm, SP), LAARNG (Washington Artillery), stationed at New Orleans. The program's main objectives are:

- To assist the sponsored unit in acquiring and maintaining a high state of combat readiness.

- To recommend training activities that enhance the training readiness of the sponsored unit and, when requested, to provide training assistance to support those activities.

- To provide the technical and tactical expertise and equipment to the sponsored unit in specific areas as needed.

- To foster a fellowship among the officers and men through a variety of military and social

functions.

The primary methods of accomplishing these objectives are through:

- A series of mobile training team (MTT)/liaison visits.

- Participation in field training exercises.

- The completion of an annual training readiness evaluation during the unit's two-week active duty period.

Although the 5th Infantry Division (Mechanized) has no command authority over the 256th Brigade until mobilization, all participating units within the division work closely with the brigade units to develop the annual training plan. The training program is developed jointly, but it is executed solely by the sponsored unit.

Two months prior to each drill period, the 1st Bn, 141st FA, notifies the division artillery S3 of the training scheduled and requests any special equipment or personnel needed to support the training objectives. A mobile training team (MTT) is then formed from division artillery assets to meet the specific request for assistance. Although the MTT has a standard composition, specific individuals are selected to tailor the team to the training being conducted. Each team consists of a team chief (lieutenant colonel), two additional officers, and a minimum of five enlisted soldiers.

Training assistance has been provided in the following areas:

- Fire direction.
- Crew drill.
- Battery operations.
- Nuclear, biological, chemical (NBC).
- Fire support.
- Survey.
- Field mess.
- Field sanitation and medicine.
- Communications.

Both tactical and technical training assistance has also been provided on organic 155-mm self-propelled howitzers and the M31 14.5 subcaliber artillery trainer. An example of this MTT concept is explained below:

Late in FY80, the 1st Bn, 141st FA, requested training assistance in tactical operations, technical fire direction, general military subjects, and inspection of their mess equipment. The MTT consisted of a team chief, a fire direction officer (LT) and two chart operators for fire direction training, a FIST chief (LT) and two fire support sergeants for observer and fire support training, and a battalion dining facility manager to inspect field mess equipment. The team departed on a Friday afternoon for the five-hour trip to New Orleans and took with them a FADAC with generator, several graphical training aids, and numerous reference manuals. Training commenced early Saturday morning and concluded Sunday afternoon.

In addition to the monthly drills at New Orleans, the 1st Bn, 141st FA, has a unique training opportunity. Each quarter, elements of the battalion travel 150 miles to Camp Shelby, MS, a state National Guard training center, to conduct live-fire training that cannot be done in New Orleans. During these periods the battalion is also joined by a division artillery MTT. The unit road-marches its wheeled vehicles from New Orleans and, through the use of an advance party, draws tracked equipment from the equipment pool at Camp Shelby. During these quarterly firing exercises, the division artillery MTT composition is tailored to assist in tactical firing battery operations. Commanders and chiefs of firing

battery generally provide all the tactical and technical assistance needed and, therefore, are usually chosen to attend these quarterly live-fire training exercises.

The program of providing MTTs and assistance visits rotates among the 5th Division Artillery's two direct support battalions, the general support battalion, and the headquarters and headquarters battery. This rotational concept provides a wider base of experience as well as aiding in the professional development and training of the junior officers, NCOs, and enlisted men who participate.

A major highlight of the Partnership Program occurs once a year when the Washington Artillery comes to Fort Polk for its two-week Annual Training (AT) and evaluation period. Months in advance, one of division artillery's organic battalions is tasked with the mission of providing training assistance during the AT period. Key personnel, equipment shortages, and training requirements are identified by the supported unit and plans are made well in advance to provide the necessary support. Training evaluators and field exercise controllers are screened and selected, and approximately 100 people with vehicles and equipment are committed in support of this training.

After AT is completed, a new long range training program is jointly developed, and the cycle repeats itself.

The artillery Partnership Program involves more than just training; it also extends into the social sphere. Reciprocal invitations are sent for all major division artillery and 1-141st FA social functions including dining-ins, artillery balls, and changes-of-command, to mention just a few. This close and personal relationship

between key officers and NCOs of both organizations has not only strengthened the fraternal ties between artillerymen, but has also been a key ingredient in the overall success of the Partnership Program.

Artillerymen at Fort Polk are proud of their relationship with their counterparts in the Louisiana National Guard. The command emphasis given to the program,

coupled with the close professional and social ties developed through mutual trust and respect, has resulted in a model Partnership Program. We at Fort Polk feel honored to be part of this vital mission. 

MAJ Michael A. Konopka is S3 of the 3d Battalion, 19th Field Artillery.

Brief History of the 141st Field Artillery (Washington Artillery)

The 141st Field Artillery began its proud existence in New Orleans in September 1838, more than 142 years ago. Since that time, the unit has served with distinction in our country's wars and has seen lively action in numerous important military campaigns.

Shortly after its organization in the Louisiana Militia as the "Washington Artillery Company at New Orleans," the unit volunteered for duty in the Mexican War where it served under General Zackary Taylor both as artillery and infantry. During its four years of Confederate service, the unit participated in 60 major engagements and gained lasting fame in such famous battles as Bull Run, Shiloh, Antietam, Fredericksburg, and the Wilderness.

During the Reconstruction Period (1865-1875), the Washington Artillery was inactive. However, as soon as the Federal ban on southern military units was lifted, the battalion reorganized and

operated as an independent military unit until 1879, when it was mustered into the Louisiana State National Guard. During the Spanish-American War, the unit furnished a battery which served as part of the Louisiana Volunteer Field Artillery. When President Wilson mobilized the National Guard in 1916, the battalion was once again in Federal service, this time as part of the 13th Provisional Division on the Mexican border. A year later, the unit was called upon to participate in World War I and saw service as the 141st Field Artillery Regiment in France.

In 1941, the unit entered four years of active duty in World War II and served with distinction in Italy, France and Germany.

At the present time, the Washington Artillery is thoroughly trained in modern warfare and is ready to carry on the proud combat tradition of its predecessors, should the need arise.



With Our Comrades In Arms

notes from other branches and services

1st Armored Division to get improved tanks

Soon to rumble into the 1st Armored division will be a welcome sight for tankers and mechanics alike: the M60A3.

Replacing the A1s and A2s currently in use, the A3 tank will feature several improvements that should make life out in the field and in the motor pool a little easier.

According to the M60A3 Deployment Control Office in Vilseck, where the tanks will be inspected and issued to units throughout USAREUR, the main differences between the A3 and its predecessors will be in the turret.

Gone is the searchlight in the traditional method of attempting a target engagement. First-round hit probability with the 105-mm main gun will be increased significantly with the M21 solid state ballistics computer system. Information processed through the computer will account for target range, type of ammunition, lead input for moving targets, drift, crosswind, altitude, air temperature, gun tube wear, trunnion cant, gunsight parallax, and gun jump.

Working with the ballistics computer system will be the laser range finder. It determines target range by transmitting a pulse of laser light aimed at the target and converting the time into range. The range finder measures the range to the first three



Improved tank M60A3.

targets it intercepts and any of the three ranges can be displayed at the commander's station. The target range information can then be fed into the ballistic computer.

Mechanics will note that the M60A3 brings several changes in the fuel system as well. The oil pan has been revised, an automatic water draining system has been added, and an improved electrical generating system has been designed to handle the increased current demand of the turret power pack.

According to the Deployment Control Office, many of the repair parts for the A1 and A2 are common to the M60A3. Prescribed load list items and special tools and test equipment are requisitioned by the supply activity at Vilseck. (Kathleen Ellison)

1st Cavalry Division receives AN/TPQ-37

The first of the Army's new artillery-locating radars, the AN/TPQ-37, is in initial operation at Fort Hood, TX, with the 1st Cavalry Division.

Developed by Project Manager Firefinder REMBASS, an element of the Army Electronic Research and Development Command, it is the first radar set that can locate single or multiple hostile artillery and rocket launchers at their firing sites. A combination of radar techniques and sophisticated computer-controlled signal processing allows the radar to detect and track the hostile projectiles simultaneously. This information is then forwarded either manually or automatically to an artillery fire direction center for use in directing accurate counterfire.

The new radar system, produced by Hughes Aircraft Company, Torrance, CA, will be assigned to field artillery target acquisition batteries at division level. The 1st Cavalry Division is the first Army unit to achieve full operational capability with the new radar sets.

A decision to proceed with full-scale production on the AN/TPQ-37 was made recently by the Army Systems and Review Committee. Full-scale production will start at the end of the extended low-rate-initial production period. (Army R,D&A)

New corps headquarters at Fort Lewis

A new corps-level headquarters, I Corps, will be formed by early 1982 at Fort Lewis, WA.

Present plans call for the new corps to command Fort Lewis, the 9th Infantry Division, and all other US Army Forces Command (FORSCOM) units at the post. The corps will also supervise training and planning for at least two other combat divisions in CONUS. Additionally, it will conduct planning in support of the 8th US Army in Korea and the US Army Western Command in Hawaii. The new headquarters will include an active component headquarters company and corps support units provided initially by the US Army Reserve and Army National Guard.

The designation, "I Corps," was previously used by a combined Korean and American Army headquarters unit in Korea. In March of last year, the designation of the Korea-based unit was changed to "Combined Field Army," to better reflect the unit's mission of controlling the combined ground forces of the two countries. This redesignation caused the I Corps title to be retired, so the newly activated corps at Fort Lewis will use the flag and historical memorabilia of the old I Corps.

Activation of a new corps headquarters originally was recommended by FORSCOM in February 1977 and was later validated by the "Army Command and Control Study 82 (ACCS-82)."

Modifications expected to improve smoke generator

Engineers at the Army Armament Research and Development Command's Chemical Systems Laboratory (CSL) are updating the M3A3 smoke generator to improve its overall reliability and to reduce maintenance time.

Used by the Army since the early 1960s, the smoke generator is a gasoline-fueled pulse jet engine which produces smoke when fog oil is vaporized in the engine's exhaust system.

Mr. Del Rod, a project officer assigned to CSL's Munitions Division, says the product improvement program will improve engine starting and reliability as well as reduce maintenance. "In addition, we are replacing the current air motor/fog oil pump with a low cost, easily maintained commercial pump," Rod said. Use of diesel fuel instead of fog oil as the smoke agent is also being investigated.

Acceptance by the Army of the proposed modifications is expected late this year with retrofitting of smoke generators scheduled for next year. (*Army R,D&A*)

Female mechanic

The days of "first women" stories in military newspapers are almost over, but a woman soldier at Aberdeen Proving Ground (APG) has distinguished herself by becoming one of a very small handful of mechanics who are qualified on both the Abrams M1 Main Battle Tank and the Infantry/Cavalry Fighting Vehicles.

SGT Geradette McElroy, 25, a six-year Army veteran from Levittown, PA, is the only woman currently serving on Abrams tank development projects. And, only she and one other soldier at APG are fully-qualified tank turret mechanics for both of these new, high-technology vehicles.

She said that in the early days of the Abrams tank and Fighting Vehicle programs, turret repair MOSs went through an evolution and that the few persons trained as 45Ks were supposed to be able to work on both vehicles. "I was qualified on both and they only had about three qualified mechanics here at the time," she said. "Today, there are separate skill areas for the two systems."

She said that the 45K field is still small; that soldiers are being trained for specific vehicles; and, that junior soldiers in the field are being trained primarily for organizational maintenance. She is qualified at the organizational, as well as direct and general support levels on the two vehicle systems.



SGT Geradette McElroy.

Initial production of XM445

A contract for more than \$5 million for low-rate initial production of the XM445 fuze has been awarded to KDI Precision Products, Inc., Cincinnati, OH. Harry Diamond Laboratories (HDL), an element of the Army Electronics Research and Development Command, awarded the contract which calls for 3,740 fuzes to be produced over a 30-month period.

The XM445, designed and built by HDL, is a low-cost, digital electronic, remotely set time fuze with an air-driven fluidic generator power supply and gearless safety and arming mechanism. The seventh HDL fuze to enter production in the past six years, it is used on the Multiple Launch Rocket System. (*Army R,D&A*)

Contract awarded for DIVAD gun

Department of the Army recently announced that Ford Aerospace and Communications Corporation will produce the Division Air Defense (DIVAD) gun system for the Army. The basic contract calls for the firm to complete a system maturity program, develop supply-support materiel and equipment, and buy long-lead time items to support FY82 production. Over a three-year period, 276 of the gun systems are expected to be produced.

The DIVAD gun system is the Army's key air defense modernization program for frontline units. DIVAD is a radar-directed automatic weapon which will defend forward maneuver battalions and armored vehicles from attack by fixed- and rotary-wing aircraft. The new system will replace the Vulcan gun currently in use.

The new air defense system is mounted on a modified M48A5 tank chassis and has radar and optical fire control with a laser range finder and a digital computer. The system's armored turret has twin guns with search-and-track radar.

The Army plans to field the new system by early 1985.

Mine detector improved

The Army's AN/PRS-7 man-portable mine detector will soon be retrofitted with new electronics to improve its arid soil performance.

The Countermine Laboratory, US Army Mobility Equipment Research and Development Command, Fort Belvoir, VA, has been working to improve the system since its poor performance in arid soils was first noticed in the mid-1970s. The AN/PRS-7 performed well in the Far East, Europe, and United States; however, during a mine clearing operation in the Suez Canal region, the detector's response to non-metallic mines in desert soils was very poor.

The improved mine detector was recently tested at

Yuma Proving Ground, AZ, an arid soil analog of the Middle East desert environment. It detected 82 percent of the inert non-metallic antitank and antipersonnel mines compared to a detection rate of less than eight percent for the standard system. Inclusion of metallic targets increased the improved system's detection rate to more than 85 percent. Testing at Aberdeen Proving Ground, MD, showed no degradation of wet soil performance as a result of the dry soil modifications.

The heart of the improved mine detector is a microcomputer which digitally processes the received signal and controls the wide-band radio-frequency transmitter and receiver assemblies.

A re-type classification action is scheduled this year to authorize a complete retrofit of the entire Army inventory of AN/PRS-7 mine detectors. The product improved mine detector will have the same external appearance as the previous unit, but will have a new battery and electronic systems to improve performance.

When fielded, the improved mine detector, designated the AN/PRS-8, will enhance the mine-detecting capability of units required to operate in the Middle East type desert environment.



The use of new electronics gives the AN/PR-7 vastly improved performance in detecting both metallic and non-metallic antitank and antipersonnel mines in arid soils.



M-3 GRANT



M-4 SHERMAN



M-47 PATTON



M-48 PATTON II



M-60 MAIN BATTLE TANK



M1 ABRAMS

Six major tank programs span 40 years of production at Chrysler Corporation since the start of World War II. The programs include the M3 Grant tank, M4 Sherman tank, M47 Patton tank, M48 Patton II tank, M60 Main Battle tank, and M1 Abrams tank. Over the years Chrysler produced more than 46,000 of the various tank models at the Detroit Tank Arsenal in Warren, MI, Lenape Ordnance Depot in Newark, DE, and Army Tank Plant in Lima, OH. (Chrysler photo)

Silicone brake fluid

More than 450,000 Army vehicles soon will be undergoing a conversion to help reduce brake system repairs.

According to a recently finalized plan, all Army tank-automotive equipment currently using hydraulic brake fluids of a polyglycol base will change to Silicone brake fluid starting in July this year. Combat, tactical, administrative, and commercially procured vehicles, along with mobile construction and materials handling equipment, are covered by the plan.

"Conversion to Silicone brake fluid will substantially reduce brake failures among Army vehicles," said Mike Cieslak, TACOM Deputy Director of Maintenance. He said each year 25 percent of the Army's vehicles require brake system repairs. Corrosion is a major factor in causing damage that makes these repairs necessary. Silicone brake fluid, because of its high surface tension, clings to metals and won't allow water to get through and corrode the metal.

The estimated cost for the program is \$6.5 million. A TACOM study has determined that a one-year conversion program will be cost-effective. Under the plan, new equipment and equipment coming out of depot storage will be converted before being issued.

Information about the conversion method is expected

to be included in a technical bulletin for distribution to units worldwide to help troops make the conversion.

Library needs material

A recent fire at the Republic of the Philippines Military Academy, equivalent to the US Military Academy at West Point, destroyed more than 14,000 volumes, including English language books, magazines, and other resource materials.

In coordination with the Chief of the Joint US Military Advisory Group, Philippines (JUSMAG-Phil), the US Army Western Command (WESCOM) has offered to assist in efforts to restore the library's material.

Accordingly, WESTCOM, with Army missions throughout the Pacific theater, including interactions with the Armed Forces of the Philippines, requests donations of books, magazines, corporate and institutional publications, or any English language materials of interest to college-level professional military students.

Materials should be sent directly to the Chief, JUSMAG—Phil, ATTN: Ground Forces Service Section, APO San Francisco 96528. For more information write LTC Karl Piotrowski, Deputy Chief of Staff for Operations and Plans, HQS WESTCOM, Fort Shafter, HI 96858.

Lighter air cushion vehicle

The US Army Mobility Equipment Research and Development Command, Fort Belvoir, VA, recently exercised the final option of its 1979 contract with Bell Aerospace Textron for the production of the Lighter Air Cushion Vehicle, 30-Ton (LACV-30). The \$21.3 million option is for the construction of four craft, bringing the total production to 12 vehicles.

The LACV-30 can carry two 30-foot MILVAN containers and has a total payload capacity of 30 tons. It can also haul wheeled and tracked vehicles, engineer equipment, pallets, and other cargo. Riding on a cushion of air, the LACV-30 can operate on water, marginal land areas, beaches, ice, and snow.

The 12 LACV-30s being produced will be formed into the 331st Transportation, Medium Lighter Company, stationed at Fort Story, VA. In addition to performing lighter, over-the-shore missions and combat service support operations, the unit will support secondary missions in coastal, harbor, and inland waterways to include search and rescue and medical emergency missions.



Light air cushion vehicle, 30-ton.

Museum opened

The Army's only museum dedicated to the history of the Noncommissioned Officers (NCO) Corps recently opened at the US Army Sergeants Major Academy Fort Bliss, TX.

According to museum curator, Dr. Daniel Zimmerman, the museum honors the NCO's accomplishments and service to the nation. "There are other museums that have exhibits covering the same periods of history," he said, "but this is the first museum dedicated solely to the history of the NCO Corps."

The exhibits depict the history of the NCO Corps by historical periods: The Revolutionary War period, 1775-1783; 1784-1860, including the War of 1812 and the Mexican War; The Civil War period, 1861-1865; the Indian War period, 1866-1891; 1891-1916, including the Spanish American War and the Pershing Expedition; World War I; World War II and Korea, 1940-1952; and from 1952 to the present, to include the Vietnam era.

When asked just what a person would learn from visiting the museum, Dr. Zimmerman replied: "Hopefully, people who visit the museum will leave with a better understanding of the history of the noncommissioned officer. They will know something about how the NCO lived and worked during each period of history. One little known fact, for example, is that it really wasn't until the Civil War that noncommissioned officers were officially put in charge of troops. After visiting the Museum of the NCO, perhaps people will have a greater appreciation for the NCO's accomplishments and contributions to the nation."

Visiting hours at the museum will be from 8 a.m. to 4 p.m. Monday through Friday.

MULE successfully completes developmental tests

The Modular Universal Laser Equipment (MULE) has successfully completed all developmental tests after more than one year of thorough and rigorous evaluation, according to an announcement from the Army Missile Command (MICOM). Hughes Aircraft has also completed delivery of 10 engineering development models to the government for further operational tests at Twentynine Palms, CA.

The MULE is a two-man portable laser designator and range finder which will be used by US Marine Corps forward observers to direct laser guided weapons and as a precision target locator for conventional artillery.

The system, weighing approximately 42 pounds, consists of three modules:

- The Laser Designator Range-finder Module (LDRM).
- The Stabilized Tracking Tripod Module (STTM).
- The North-/Finding Module (NFM).

Hughes aircraft has designed and built the LDRM and STTM under contract to the Army, while Sperry is developing the NFM under contract with the Navy.

MULE is being developed by MICOM to satisfy a US Marine Corps requirement for a lightweight precision laser designator/target locator. (*Army R,D&A*)

M23 breathing apparatus improved

Explosives and missile fuel handlers as well as firefighters and others who work in toxic or oxygen-deficient environments might soon benefit from improvements made to an Army breathing device developed at the Chemical Systems Laboratory (CSL).

Designated the M23 Breathing Apparatus, the appliance is designed to support explosive ordnance disposal teams and workers who must handle rocket fuels as well as personnel who work in toxic atmospheres.

According to Mr. John Shriver, the breathing apparatus project officer assigned to CSL's Physical Protection Division, the product improvement program includes converting the device to a pressure-demand type that will provide a constant positive pressure breathing system. This will make it much safer and satisfy requirements of the National Institute of Occupational Safety and Health.

"Another valuable aspect of this self-contained apparatus," Shriver said, "is the quick disconnect capability for compressed air bottle replacement. We have also reduced the overall weight of the system as well as cut back on costs."

"Current available systems have severe limitations for use in toxic agent environments, but with the improvements on the M23, such as the hood-jacket, the system will meet all known requirements," he said.

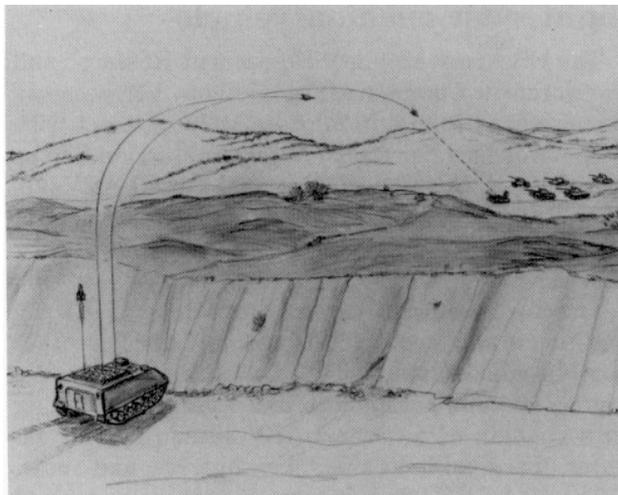
The hood-jacket is being developed to be worn over the M23 not only to protect the wearer but also to protect the apparatus against such severe requirements as red fuming nitric acid and jet fuel. Certification for Army-wide use is expected later this year. (*Army R,D&A*)

Fiber-optic link tested

A fiber-optics communications system that will enable a safely concealed gunner to remotely direct a guided missile to a battlefield target is currently under development for the US Army by Hughes Aircraft Company.

In an advanced development program called Integrated Fiber-Optic Communications Link (IFOCL), Hughes and its principal subcontractor, ITT Electro-Optical Products Division, are working on techniques that would enable a fine fiber-optic thread to be used to communicate between a launcher and a missile in flight.

Program officials say the system has the potential to provide the basis for a low-cost "lock-on-after-launch" antiarmor missile with extended range and immunity to enemy countermeasures.



Drawing illustrates a potential application of an Army missile communications system employing fiber optics which provides a secure two-way link between the launcher (safely hidden in defilade) and the missiles which are being fired in rapid succession.

The concept calls for a missile with an imaging seeker in its nose to be fired in the direction of a known enemy force. The scene viewed by the missile would be communicated back to a gunner over a single strand of optical fiber which is payed out from a spool in the aft end of the missile. The gunner viewing the scene on a video-type display selects a target, and guidance commands are automatically transmitted to the missile over the fiber-optic link.

The most promising aspect of a fiber-optic missile communications system is its ability to transmit the wide-band signals required for video images. While, in principal, metal wire or coaxial cable is capable of transmitting such signals under certain conditions, they are not suitable for tactical missile applications because of bulk, lack of strength, or other operational limitations.

Other advantages of the fiber-optic missile communications system are:

- Lower missile cost and an increase in system reliability are possible because much of the data processing is done at the launcher, enabling missile electronics to be simplified.

- Optical signals cannot be detected or interfered with by enemy countermeasure jamming.

- The "lock-on-after-launch" capability provided for the missile means that it can be launched from either ground vehicles or helicopters in defilade without exposing the crew to enemy fire.

- With the missile's entire flight under the control of a gunner, there is greater confidence in optimum target selection than with some other "lock-on-after-launch" concepts.

In an earlier phase of the program, Hughes and its team member, ITT, demonstrated success in overcoming two of the primary technological hurdles in development of the system:

- The development and fabrication of long lengths of a thin fiber-optic cable (0.012 inches or 300 microns in diameter) with unusually high tensile strength (200,000 pounds per square inch) and low signal transmission loss both in the wound and unwound condition.

- The ability to pay out long lengths of the optical fiber at simulated missile velocities without snapping or snarling.

In a recent rocket sled test at Holloman Air Force Base, NM, the fiber was successfully payed out at high speed as a simulated video signal was transmitted through it. The maximum signal loss was less than four decibels per kilometer over the graded index-type fiber which has a glass interior and plastic jacket.

A potential major cause of signal attenuation in the system comes from "spooling loss," the result of winding the optical fiber around a spool. With an optical fiber bent around a spool, there is a loss in the signal strength of the coded light pulses which carry the communications. By optimizing fiber characteristics, spooling tensions, and dimensions, the level of these micro-bending losses was significantly reduced.

New mortar system at Fort Lewis

The Army's newest mortar, a 60-mm, M224 lightweight company mortar system, has recently been fielded with the 2d Ranger Battalion, 75th Infantry, and the 2d Battalion, 47th Infantry, 9th Infantry Division, at Fort Lewis, WA.

The M224, which includes a 60-mm mortar tube that fires a high-explosive cartridge with a multi-option fuze for indirect fire support, is the Army's first new mortar in 25 years.

The unique feature of the multi-option fuze is the commander's ability to select the burst height that will

cause the greatest damage. The fuze can be set, without tools, to explode in a proximity mode (3 to 13 feet above the surface), near-surface burst (0 to 3 feet), impact, and delay.

The 47-pound mortar replaces the 60-mm, M19 mortar presently found in Ranger units and the 93-pound, 81-mm M29A1 mortar in light infantry, airmobile, and airborne rifle companies.

The M224 has a range of 3,500 meters and a much higher rate of fire due to improvements in the mortar tube and the use of a cool-burning propellant on the high-explosive round. The new mortar weighs less and is more portable than the 81-mm mortars.

The next unit programed to receive and test the new mortar is the 82d Airborne Division, Fort Bragg, NC.

Improved TOW missile deployed

The first deployment of Improved TOW missiles to US soldiers stationed in Europe has been completed on schedule as the Army has begun modernizing its heavy-assault tank killer.

Although similar in size and weight to the basic TOW missile deployed since 1970, Improved TOW features a redesigned five-inch diameter warhead that will penetrate heavier armor.

The new warhead can be retrofitted to existing missiles, thereby protecting the Army's investment in fielded missiles and launchers. More than 275,000 missiles have been produced by Hughes Aircraft Company for the Army, Marine Corps, and 32 countries.

Improved TOW, the first evolutionary improvement to existing US Army Missile Command (MICOM) antiarmor hardware, is intended to counter near-term enemy armor threats.

Meanwhile, MICOM and Hughes continue development of TOW 2, which will counter even more sophisticated enemy armor with its six-inch warhead, a new flight motor, and improved guidance system.

TOW 2 will be available later in this decade.

Commanders Update

COL Leslie E. Beavers
1st Armored Division Artillery

LTC Robert A. Allen
2d Battalion, 3d Field Artillery

LTC Gary L. Zwicker
1st Battalion, 27th Field Artillery

COL Jerome H. Granrud
210th Field Artillery Group

LTC Robert A. Ames
3d Battalion, 21st Field Artillery

LTC Joseph A. Siraco
512th Group



Training Realism: Lifeblood or Lip Service

by LTC Floyd V. Churchill Jr.

“The Army should train the way it fights. Realism must be the foundation of all training programs.” (page 18, Training Circular 21-5-7, “Training Management in Battalions.”)

Realistic training and train the way you are going to fight have been catch phrases in the Army for more years than most of us have served. Although all commanders seem to agree with the concept, how many do in fact establish an environment in which

soldiers can train the way they will fight and then encourage his subordinate commanders to enforce this type of training.

Consider the following scene—one in which we have all participated in one capacity or another: A battalion commander is talking to one of his battery commanders about an upcoming field training exercise. “I want some good training going on out there with plenty of realism. You may get some visitors,

Jim, so be sure your troops are looking good. Make sure you've got them all employed in some type of training; I don't want to come out there and see people sitting around. Also have an operations order made up for the exercise; you might be able to use one of your old ones and just cut and paste. Be sure everybody knows exactly what he's supposed to do and when he's supposed to do it. You should be able to carry all your rounds with you when you go, and fuel shouldn't be a problem because you'll only be moving twice. You can get us by radio in case of emergency during duty hours, and the staff duty officer can be reached by land line. Oh yeah — remember the last visit we had from div arty. Be sure you have wire and engineer tape around your FDC (fire direction center) and put a smart guy at the entrance to your position. Let me know if there's anything I can help you with."

There are certainly a variety of possible interpretations for this "conversation"; but, regardless of the latitude granted this battalion commander, he has dealt the realism of this battery commander's training exercise a bitter blow. A loaded phrase such as "troops looking good" frequently translates to highly shined boots, starched fatigues, and disfunctional showcase installations. Having everybody "employed in some kind of training" defeats one of the implicit objectives of extended training exercises: to learn to organize and function on a 24-hour basis. If the exercise is to last two or three days and is to be conducted as this unit would actually fight, then a certain percentage of the battery's personnel *should* be sleeping or resting at any given time. The *pro forma* use of detailed operations orders filled with minutia, when they are not really required nor supportive of the training, is not only a waste of valuable planning time which should be used to determine specific training objectives but also creates a false impression of the role and importance that operations orders will play in combat. A detailed plan, which specifies each event and the time it will occur, denies the battery's junior leaders critically important training in dealing with those unforeseen occurrences that frequent the battlefield. Finally, arranging training so that there is no requirement to exercise normal logistical activities such as refueling or rearming procedures eliminates those essential training experiences for the combat service support elements and encourages learning procedures that may prove catastrophic in actual combat.

Although our mythical commander has laid out other pitfalls in his guidance, those noted above are sufficient to make the point: the need to train realistically is a universally accepted principle that is

almost always subverted in practice. Training realistically is not easy and, for a good many of us, does not come naturally. If good training is to be conducted, however, our trainers and training managers must make a conscious effort to apply the basic principles of training realism when planning and determining what resources their training activities will require. The principles that follow are not new, but they are actions that frequently escape the grasp of those charged with the preparation and execution of training.

•*Use training realism only when and where it is appropriate and functional.* Much of the most important training on individual tasks is best taught in environments akin to those of training centers or in the form of a service practice. In fact, the training of many tasks in a tactical scenario is not only inappropriate but may also hinder the effectiveness of that training. Basic technical skills should be learned in a distraction-free environment and later integrated into the scheme of a tactically realistic scenario when personnel are qualified to perform them to required standards. Some technical areas, such as the fundamentals of crew drill for cannoneers and mission procedures for FDC personnel, provide excellent samples of this principle.

•*Train for the unexpected.* When deciding whether or not to do something, the appropriate decision often becomes evident if the trainer will stop and ask himself, "If I were operating south of . . . would I do it that way?" In other words, if I were in a real combat situation, what would I do?

•*Exercise your tactical standing operating procedures (TSOP).* A unit's TSOP provides one of the best potential guides for realistic training *if* that TSOP, in fact, reflects what that unit plans to do in combat. The need to decide how to train on various actions is simplified in that the training becomes merely an exercise of the procedures outlined in the unit TSOP. Refueling procedures are an excellent example. Units habitually top-off all fuel tanks before going to the field and consequently rarely need more fuel during an average field problem. Having batteries go to the field with varying levels of fuel and requiring them to exercise both the TSOP fuel request and refueling procedures provides valuable and necessary training in a number of critical collective tasks.

•*Don't simulate operations you can do.* Training realism can be compared to a "light bulb"; it is either on or off—not "kind of, somewhat, or partially operational." Few things are more destructive to "realistic" training than selective enforcement

which is common in almost all field problems. Some examples are:

1) Headquarters elements "simulate" movement or stay administrative.

2) Operations switch back and forth between tactical and administrative for reasons other than to provide critique or require redoing a task correctly.

3) Senior officer and enlisted personnel exempt themselves from the uniform requirements imposed by the TSOP.

•Use all appropriate training assets to increase training realism. Most of us will use those training resources immediately available in our unit, but how many use assets available outside of the organization? Just a few examples of valuable external assets include:

1) Engineer support for hardening positions and

training in emergency demolition of vehicles and equipment.

2) Soviet tanks and armored personnel carriers from Foreign Materiel Sections.

3) Aircraft to act as opposing forces (OPFOR) scout or attack helicopters.

4) Electronic warfare (EW) teams to jam and monitor radio communications.

Realistic training does not just happen; it requires thought and planning. The "mental checklist" in figure 1 should assist the training manager and his trainers in incorporating realism in their training exercises. This checklist, which represents the practical extension of the principles previously discussed, has three elements: environment, operational considerations, and training assets.

<p>Environment:</p> <ul style="list-style-type: none"> • Do I require all field training to be "realistic" or only that training which is really enhanced by such a requirement? • Do I design safety requirements to facilitate realistic operations, or are they overly restrictive? • Do I provide positions to subordinate elements based on the most suitable terrain for tactical employment or merely on their convenience for firing? • Do I require operations orders for all field training regardless of their importance to the training at hand? • Do I expect my subordinates to wear starched uniforms and highly shined boots to the field? Or, is emphasis placed on personal maintenance expected of field soldiers? <p>Operational considerations:</p> <ul style="list-style-type: none"> • How is ammunition controlled and issued and are batteries required to exercise resupply procedures routinely? • Do I expect everybody to be doing something or do I demand that my subordinates train on a 24-hour-a-day basis, learning to utilize shifts and reduced-manning procedures? • Are battery moves controlled from battalion during field training or is the move requirement "magiced"? • Are units required to submit all reports listed in the TSOP when 	<p>operating in a simulated combat environment?</p> <ul style="list-style-type: none"> • Do commanders routinely select alternate or supplementary positions? occupy them? • Do units refuel when and how according to the TSOP? • When not participating in basic skills training or early stages of unit training, are troops required to dig fighting positions in their battery areas or are they simulated? • During battalion-sized operations, are batteries positioned to facilitate ease of administration, movement, and control, or are they tactically dispersed at TSOP distances? • When conducting realistic tactical operations with no intentional simulations: <ol style="list-style-type: none"> 1) Are observation posts required to be put out in adequate numbers at realistic distances? Are they manned around the clock? Do they have communication with their units? 2) Are soldiers made to wear chemical defense equipment (CDE) for extended periods? 3) Is electronic warfare habitually used? Are there penalties assessed to subordinate units that overuse radio nets? 4) Do I assess personnel and equipment losses routinely and force my subordinates to reorganize and react to the resulting difficulties? 5) Do I require all units to carry, protect, and execute anticipated wartime missions with nuclear training 	<p>items of the type and amount they will really have?</p> <ul style="list-style-type: none"> • Another way of saying all of the above: <i>Do you use or ignore your TSOP when you go to the field?</i> <p>Training assets:</p> <ul style="list-style-type: none"> • Have I considered all the possible uses of available aviation assets: aerial observers, airmobile operations, armed air OPFOR? operations security (OPSEC) evaluation of camouflage from air? • Is there any Warsaw Pact equipment available for demonstrations or inclusion in the exercise? • Have I talked with the engineer units about providing equipment to dig in guns, lay down armored vehicle launched bridges, and teach demolitions? • Can I get support from intelligence units for signal analysis, jamming, radio direction finding, or OPSEC evaluations? • Can the local chemical company provide chemical attacks against my positions, evaluate my NBC training, or present performance-oriented training on enemy capabilities? • Have I talked with the maneuver units operating in my area to see if we can run two-sided exercises such as an infantry reconnaissance element conducting a fixing attack against a battery practicing battery security? • Finally, have I gotten with my artillery counterparts to work out mutual support for equipment and large OPFOR contingents?
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Figure 1. Checklist.



T-54 attacking battery position.



Battery personnel responding to an ambush.

Applying the aforementioned principles and adhering to the checklist should result in well-planned, realistic training. One might, for example, consider how our mythical battalion commander's guidance would change if he applied the axioms of realism. "Jim, your battery FTX (field training exercise) should be a good opportunity for you to exercise and evaluate your TSOP. You've got a good base in your individual skills training now, so it's time to hit hard on performing exactly as you would in the Fulda Gap. I don't want you simulating anything you can actually do. I expect you to refuel, rearm, feed, sleep, move, and communicate *exactly* the way our SOP says — the way you would do it if you were in combat. The battalion's support elements will be available for resupply through the TOC (tactical

operations center). Use the correct report formats and be sure you submit all information required by the TSOP. I will be out to see you, but don't do anything special and *don't* have people looking pretty or doing busy work! I'm going to expect you to show me your off-shift and explain how you insure they get enough rest. One final note — don't forget to confirm your engineer, OPSEC, and OPFOR support with the S3. I'm still working with the commander of the 269th Infantry to get a two-sided exercise for you with one of his companies. He told me his unit needed work on ambush and your convoy would provide him an excellent target. Remember you're tactical from the time you leave the Kaserne until you're back. Looks like you've got an excellent opportunity for a good exercise. Good luck, let me know if I can help."

When all is said and done, the realism in a unit's field training is a function of its importance to the commander. "Good field training," other than instruction in basic skills, is by definition not good if it is not realistic. History has shown time and again that the commander who is unwilling to discipline his force to the rigors of realistic training in peacetime is condemning them by his own negligence or ignorance to a much harsher fate when called upon to perform in war. To paraphrase the Roman Josephus speaking of training methods: "Our drills must be 'bloodless battles' and our battles 'bloody drills'." Lieutenant General "Ace" Collins, one of our Army's most highly regarded trainers, captured the essence of this concept in a similar fashion in his book *Common Sense Training*, when he noted:

"Anyone who complains about not being able to make training realistic lacks the power of observation, tactical knowledge, or imagination. He may be deficient in all three areas — if so, he should not be training troops The objective of realism in training is not so much to create fear or pressure as it is to foster an understanding of the extreme mental and physical demands of combat. The objective should be to make each soldier realize, insofar as he can, what really happens when the shells start flying and to imbue him with the firm conviction that he can still function effectively once the fighting begins." ☒

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Simulating Indirect Fires in an Instrumented Battlefield Environment

by MAJ Jerry L. Wisdom

Tanks firing at TOWS with a weapons engagement scoring system (WESS) as the firing instrument are only two elements of the several combined arms players training to fight. Other fighters directly affecting an instrumented battle are the infantryman (mounted or dismounted), the engineer, the scout, the artilleryman, the mortarman, and the communicator. Whether our forces are in the active

defense or on the offensive, it is imperative that all fighting systems be used at maximum standoff range to decrease vulnerability and increase survivability on the highly lethal mid-intensity battlefield such as the Egyptian-Israeli conflict in 1973. How do we train our younger officers who have no combat experience to fight in this environment?

A way of contributing to this training effort is through instrumented war games using lasers, computers, and advanced technologies. If our ground gaining comrades are developing their ability to fight by training in an instrumented environment (even if conceptual in nature), the indirect fire people must keep pace. Our indirect fire system must be highly responsive to the fighting commander's needs at the critical point in his portion of the battle.

Three basic approaches to simulating indirect fires are the personnel intensive, the technological intensive, and a combination of the two.

The personnel intensive approach appears to be the more traditional way of simulating indirect fires. One excursion into this approach was on the Multiple Integrated Laser Engagement System (MILES) Operational Test II (OT II) conducted by the TRADOC Combined Arms Test Activity (TCATA). This was not a test of indirect fire simulation, but one designed to examine laser shooting, laser detection means, and laser signatures related to various direct fire weapon systems.

The indirect fire system used during the MILES OT II (figure 1) consisted of a team of trained fire markers working under the control of a central fire marker control center (FMCC). The fire markers were positioned in 1/4-ton trucks throughout the

training areas. When the FMCC received a fire mission from the FIST, it directed a fire marker to the computed coordinates to detonate artillery simulators. Adjustments were called to the FMCC by the FIST and the process was repeated. Fire markers used controller guns (laser transmitters) to cause casualties among the direct fire weapon systems. An extension of this system was reported in the September-October 1980 issue of the *Field Artillery Journal*, "Miles Realistic Training for Direct Support Artillery." It was an improvement over the one in figure 1 since, in addition to the FMCC, the fire support team (FIST), fire direction center (FDC), and firing battery were also separately represented. This arrangement gave a more traditional way of playing artillery as shown in figure 2. An example of how it works is:

- The maneuver commander designates the target.
- The FIST calls for a fire mission.
- The fire direction center computes firing data and transmits it to the firing battery sections.
- The firing battery places the data on the guns and "dry fires."
- The gun controller transmits the data on the guns to the FMCC.
- The FMCC computes the probable impact point and sends movement instructions, including distance and direction, to fire markers located at known points in the maneuver area.
- The fire marker paces off or drives the distance and marks the target.
- The FIST observes the burst and adjusts fire accordingly.
- The FIST provides feedback to the fire direction center which provides feedback in turn to the firing battery.

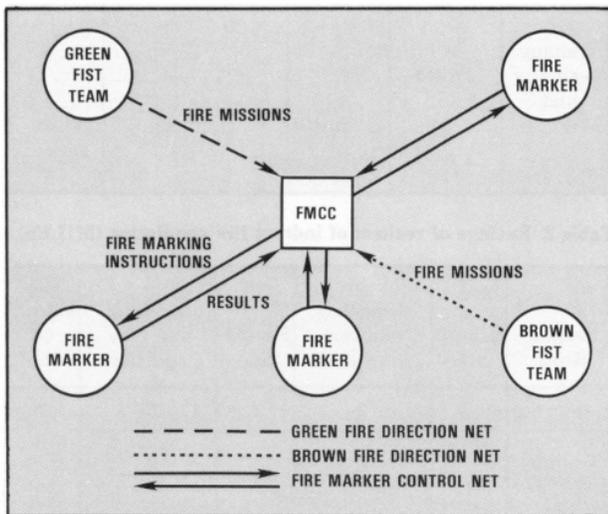


Figure 1. MILES OT II indirect fire system.

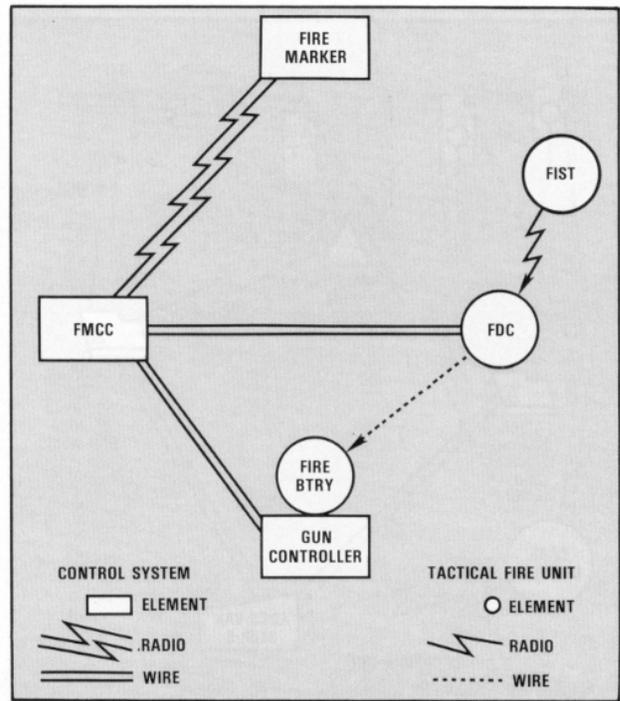


Figure 2. Elements of artillery engagement simulation operation.

Figure 2 represents an improved indirect fire support system over the one used during the MILES Operational Test II conducted by TCATA. Some of the problems with both these personnel intensive systems are:

- The requirement to be an excellent map reader.
- Communications must be excellent within the fire marking system.
- Terrain traversing time causes delay.
- Low visibility of simulated impact point to adjacent weapon systems.
- Lack of interface with the instrumented weapons in an objective manner.

Some of these problems are obvious while others require deeper understanding of the entire instrumented battle. Part of this is the dilemma of subjective and objective information. The TCATA Artillery/Mortar Simulation and Recording System (TAMSIRS) designed for use during the Division Restructure Study Phase I was an early effort toward this more objective approach. It too, offers subjective insights with some increase in objectivity.

A sample TAMSIRS fire mission with step-by-step explanation (figure 3) follows:

- Step 1.** Observer sees target.
- Step 2.** Observer transmits a fire mission to either the artillery or mortar FDC.

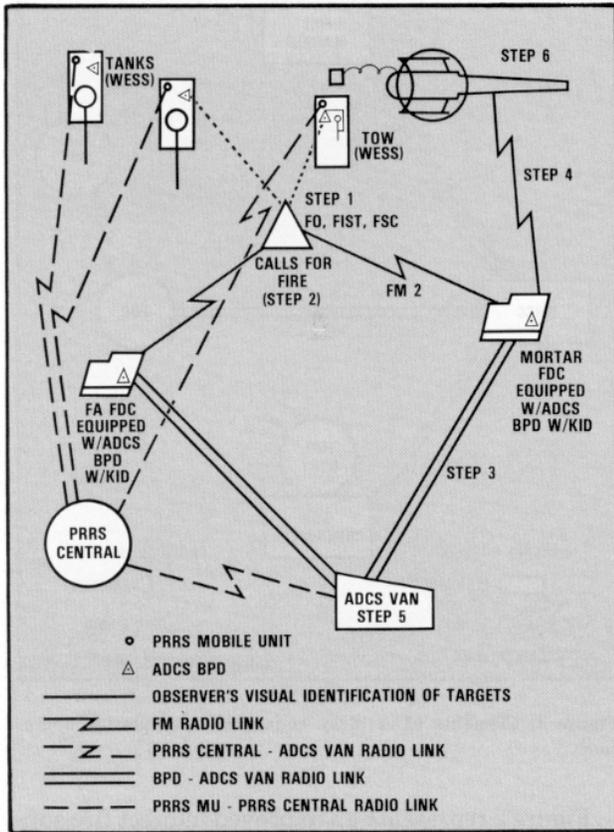


Figure 3. TAMSIRS indirect fire system operation.

•**Step 3.** FDC enters type of artillery, number of tubes, and grid location of the target into the Automatic Data Collection System (ADCS) computer via a basic portable device (BPD) or a keyboard input device (KID). Upon receipt of a valid fire message, the ADCS computer automatically imposes a delay to simulate actions of the firing unit prior to arrival of the projectiles on the target.

•**Step 4.** Simultaneous with actions in Step 3, FDC personnel (using a separate FM net) call the fire marking helicopters and direct them to drop smoke on the target grid.

•**Step 5.** After receipt of the valid message (Step 3), the ADCS computer, using location inputs from the Position Reporting and Recording System (PRRS), determines which instrumented systems are in the suppression zone and which are in the kill zone. The computer suppresses all vehicles in the suppression zone and determines which vehicles in the kill zone have been destroyed. Any vehicle killed can only be removed from instrumented play through manual notification (e.g., PRRS Central gets a visual signal that a vehicle has been destroyed and the control organization superimposed over the player unit must notify the vehicle commander that his vehicle has been removed from instrumented play). In order for any vehicle to participate in a

TAMSIRS engagement, that vehicle's Basic Portable Device (BPD) identity must be entered as a player in the ADCS computer. When a vehicle is killed, its BPD identity is withdrawn from the list of active players and it can no longer participate. Locating and stopping the killed vehicle is the responsibility of the nearest controller on the ground, who is notified by test control operations.

•**Step 6.** The fire marking helicopters mentioned in Step 4 deliver smoke on the target area to simulate artillery volleys.

Both the MILES and TAMSIRS systems were evaluated for effectiveness. The personnel intensive MILES test participants (figure 1) evaluated the simulation system in terms of responsiveness, effectiveness, and realism. The results are shown in tables 1 and 2.

Table 1. Ratings of indirect fire simulation (MILES).

Number of Responses					
Respondents	Sample size	Very poor and poor	Borderline	Very good and good	Unknown or NA
Responsiveness					
Controllers	7	2	0	4	1
Training Evaluator and Manager	11	0	4	7	0
Effectiveness					
Controllers	8	0	2	4	2
Training Evaluator and Manager	11	0	3	8	0
Players	117	29	27	54	7

Table 2. Ratings of realism of indirect fire simulation (MILES).

Respondents	Sample size	Unrealistic and very unrealistic	Borderline	Realistic and very realistic	Unknown or NA
Controller	8	2	4	2	1
Training Evaluator and Manager	11	2	3	6	0

Table 3. TAMSIRS summary of indirect fire suppression.

Type ^a task forces	OPFOR ^b vehicles	Total suppressions ^c		Number of volleys fired		Number of founds fired		Volleys per suppression		Rounds per suppression	
		(no)	(pct)	FA	Mortar	FA	Mortar	FA	Mortar	FA	Mortar
		Q	R	S	T	U	V	W	X	Y	Z
I	300	52	17	233	56	1,880	231	4.50	d	36.2	d
II	354	92	26	362	87	2,519	454	3.97	87.00	27.6	454.0
III	296	160	54	390	58	3,272	223	2.58	5.27	21.6	20.2
IV	349	190	54	495	178	3,714	697	2.79	13.70	20.9	53.6

^aThese type task forces represent a particular tank or mechanized infantry battalion task force which were friendly when each trial was being executed during DRS phase I at Fort Hood.

^bCumulative number of instrumented OPFOR (opposing forces) vehicles available to be suppressed at beginning of all trials.

^cPercentage shows a ratio of total suppressions to number of OPFOR vehicles available to be suppressed and includes both artillery and mortar data.

^dThere were no mortar suppressions.

The respondents rated the MILES personnel intensive system 83 percent responsive as borderline or good. Effectiveness was rated 72 percent as borderline or good while realism was rated 79 percent as borderline or realistic. Therefore, we might conclude this particular personnel intensive indirect fire simulation system met the needs of that particular test. However, there were some defects (as related to the idea of objective results of this personnel intensive system) which were clearly subjective in nature.

TAMSIRS, which was evaluated in a more objective manner using similar criteria (table 3), also contains problems, the more important of which are:

- The person dropping smoke must be an excellent map reader.
- There is a great reliance on communication.
- Flying is weather-dependent.
- There are artificial artillery/mortar variables.
- Aircraft constraints are endemic.
- Troops may fire on friendly helicopters, thinking they are enemy.
- Troops may run away from hovering helicopters to avoid being assessed as a casualty.

Although there are some subjective aspects to TAMSIRS, its strength is the traditional objective approach to the measures of effectiveness.

Any true assessment of either the personnel intensive or the perhaps more objective TAMSIRS is difficult because of the lack of any side-by-side system comparisons minimizing the number of different variables in each. A comparison of the two systems cannot be made due to their dissimilarity and many resultant variables.

The strength of the MILES Fire Marker System is the subjective nature of artillery/mortar simulation and is rated more clearly by the maneuver elements. It, too, represents an early effort at the subjective way of simulating artillery/mortar.

Artillerymen must accept the reality of the lack of

realism simulating the destructive force of massed artillery fires. These early efforts are attempts to keep pace with our comrades in the infantry and armor units who are rapidly approaching a reasonable level of realism using lasers for small unit training. Artillery/mortar simulation needs more work, money, and other resources to keep pace. If this does not materialize, our ground gaining arms will receive valuable training from direct fire weapons without the contribution of indirect fire systems. ☒

In October 1980, the US Army Field Artillery School submitted in coordination with the Combined Arms Center, the Infantry and Armor Schools training device need statements to develop devices in five areas of indirect fire engagement simulation.

1) Timely and realistic assessment of casualties caused by indirect fire.

2) An audio-visual cue (smoke, flash, bang) for indirect fire which has a minimum stand-off range of 500 meters.

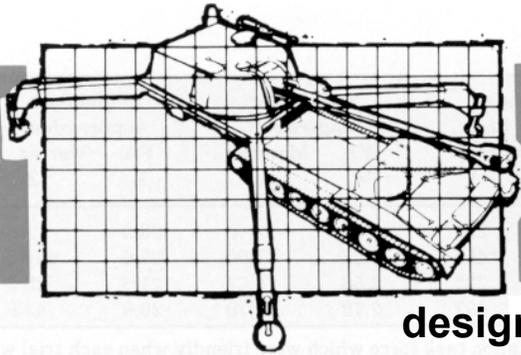
3) Firing battery or mortar section involvement which has a shootable round for the section to fire and measures errors which are displayed as (1) and (2) above.

4) A GLLD (Ground Laser Locator Designator) which will replicate the functions of GLLD/Copperhead systems in a MILES engagement simulation exercises.

5) Realistic integration by artillery target acquisition assets into MILES exercises.

These five needs are currently being developed by Project Manager TRADE, who is funding the current research efforts of Georgia Institute of Technology, Jet Propulsion Laboratory, and US Army Human Engineering Laboratory.—Ed.

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FA Test and Development

design • development • testing • evaluation

MLRS maturation tests conducted

In April this year, the Vought Corporation, aerospace subsidiary of the LTV Corporation, successfully fired a Multiple Launch Rocket System (MLRS) rocket from a self-propelled launcher loader, marking the beginning of an extensive series of maturation-phase test flights.

The MLRS is a battlefield artillery system employing a tracked mobile launcher which can quickly fire, without reloading, up to 12 rockets. It can direct a massive volume of defensive firepower against many targets in succession to neutralize attacking forces and their equipment.

Vought was selected as MLRS prime contractor in April 1980 and began an "early launch" maturation test flight program last November. During those tests, six MLRS rockets were fired, each as a single round from a stationary, rigid launcher.

The testing phase will be followed by production qualification flights and then by US Army operational test flights. A total of 100 rockets in single and multiple round firings will be launched over a variety of ranges, mission profiles, and environmental conditions. Rockets for the production qualifying test flights are scheduled to be built with production tooling late this year.

Contract awarded for AN/TPQ-37

The Army Electronics Research and Development Command (ERADCOM) recently signed a multi-year, \$154 million contract with Hughes Aircraft Company, Fullerton, CA for a full-scale production of 30 AN/TPQ-37 artillery-locating radar systems.

The contract, amounting to more than \$94 million for the first year and nearly \$60 million for the second year, is the largest single contract ever awarded by the command.

The AN/TPQ-37, along with the AN/TPQ-36 mortar-locating radar, make up the Firefinder system developed by ERADCOM's Project Manager Firefinder/REMBASS, Fort Monmouth, NJ.

Finalization of corporation agreements

Diehl GmbH of Nuremberg, West Germany, and Martin Marietta Corporation through its subsidiary, Martin Marietta Orlando Aerospace, Orlando, FL, have signed final agreements for the establishment of a European corporation — PGM Systems — to assist in rationalizing, standardizing, and improving interoperability of NATO's weapons.

PGM Systems initially will be financed, staffed, and managed jointly by the two founding principals, but plans call for the admission of a third company. The Defense Technology Division of the privately-owned Diehl company is a major manufacturer in Germany for ammunition of various calibers, weapons, tank tracks, and electronic components, and for many years has undertaken an experimental study in the field of terminal guidance munitions. Martin Marietta Orlando Aerospace is the US prime contractor for the Copperhead 155-mm cannon-launched laser-guided projectile and the US Navy's 5-inch guided projectile and is also developer and producer of a number of major weapons and fire control systems.

Martin Marietta and Diehl officials state they are convinced that guided projectiles, terminally guided weapons, and submunitions offer a significant advantage in combat capability for NATO forces as a deterrent against the numerical superiority of Warsaw Pact armored elements. The only field-tested and available projectile of this type is the Copperhead. Extensive testing and analysis have demonstrated Copperhead's effectiveness on European terrain and under European weather conditions.

PGM Systems will act initially as European prime contractor for management, planning, manufacture, and logistic support within Europe in the field of terminally guided weapons. Its first task will be Copperhead which is fully compatible with a number of NATO howitzers, including the FH70, SP70, 155GCT, and M109G. It can also be used with a variety of airborne and ground laser designators.

New method takes the work out of finding north

"It's so simple I'm surprised no one thought of it before." This is typical of the comments being made by members of the surveying community about a fast, improved method for establishing true north or south to an accuracy of two mils or less. The Circumpolar Method of Orientation was recently developed as a means for the rapid orientation of artillery under nighttime conditions and may prove useful for many other surveying and construction needs. The device was developed by Mike McDonnell and Don Dere, researchers at the US Army Engineer Topographic Laboratories, Fort Belvoir, VA, at the request of the Commandant, US Army Field Artillery School.

Current methods using the stars for nighttime orientation are deficient in that they involve complicated techniques, high operator skill levels, and equipment that may not always be available.

The invention, based on a surprisingly simple theory, consists of the addition of three etched circles on the reticle of the aiming circle presently being used by Army artillery units. No modification is required to the aiming circle except for the relatively simple replacement of the reticle.

The technique involves sighting on Polaris (the North Star) and two other circumpolar stars. When these stars are set on the proper circles, the instrument is pointing at true north. With this method there is no need for any mathematical calculations, "look-up tables," or timing systems.

The entire process is simple and rapid and, because it involves only a change to the reticle, will be quite inexpensive to implement. Operators familiar with the aiming circle can be trained in the new procedure within half an hour.

New ammo plant

The Army's first new ammunition plant in more than 25 years is under construction near Bay St. Louis, MS.

The Corps of Engineers' Huntsville division was responsible for design review and contract award and the Mobile district is supervising construction of the Mississippi Army Ammunition Plant. Construction, estimated at a total cost of \$180 million, is being done by commercial firms.

The plant is expected to contribute significantly to the Army's capability to meet mobilization requirements for a new type of artillery shell. The facility is designed to produce 120,000 rounds of the new 155-mm M483A1

shell per month. The shell is among the latest and most sophisticated of the Army's improved conventional munitions.

The Mississippi plant will consist of three separate manufacturing complexes, plus support and administrative facilities. Construction began in December 1978 and is scheduled for completion in 1983.

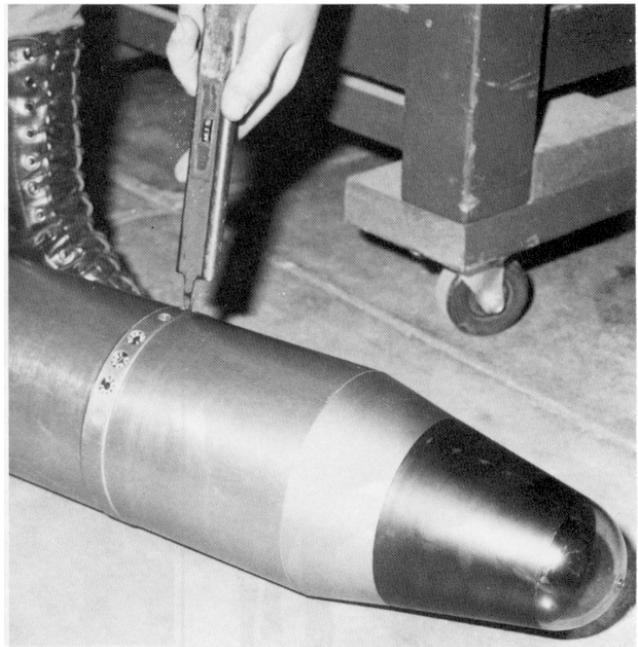
Copperhead production

The US Army has awarded Martin Marietta Orlando Aerospace a \$59.5 million contract for further production of the Copperhead laser-guided projectile. The contract covers the second year of full production of this advanced artillery weapon system.

The precision-guided Copperhead gives conventional 155-mm artillery the capability to destroy armored targets many miles away. A laser seeker in the nose of the shell provides pinpoint accuracy against both stationary and moving targets by homing in on a laser beam directed on the target by an airborne or ground forward observer.

Production began in March 1980 under a \$62 million contract from the Army Armament Research and Development Command at Picatinny Arsenal, NJ. Quantities to be produced under these contracts have not as yet been announced.

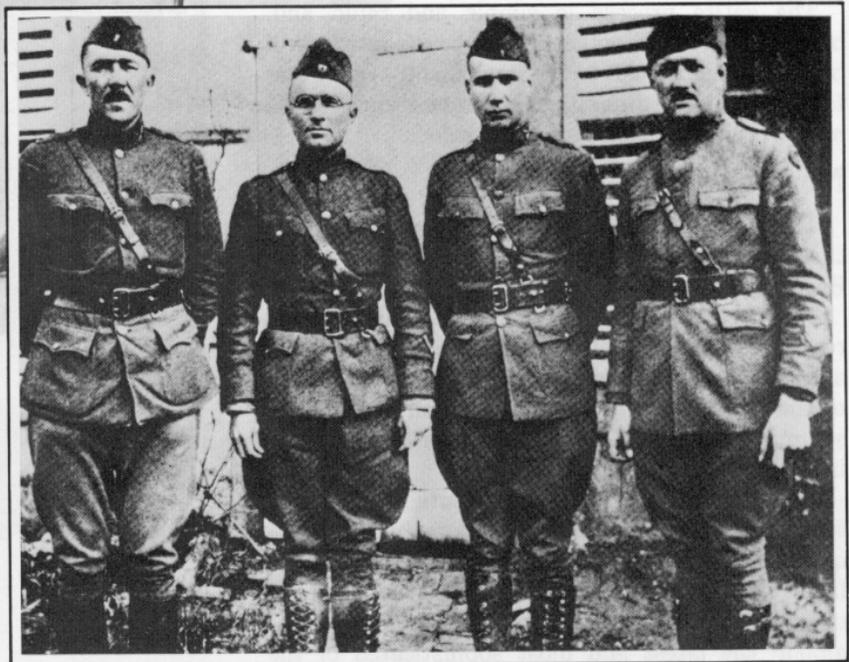
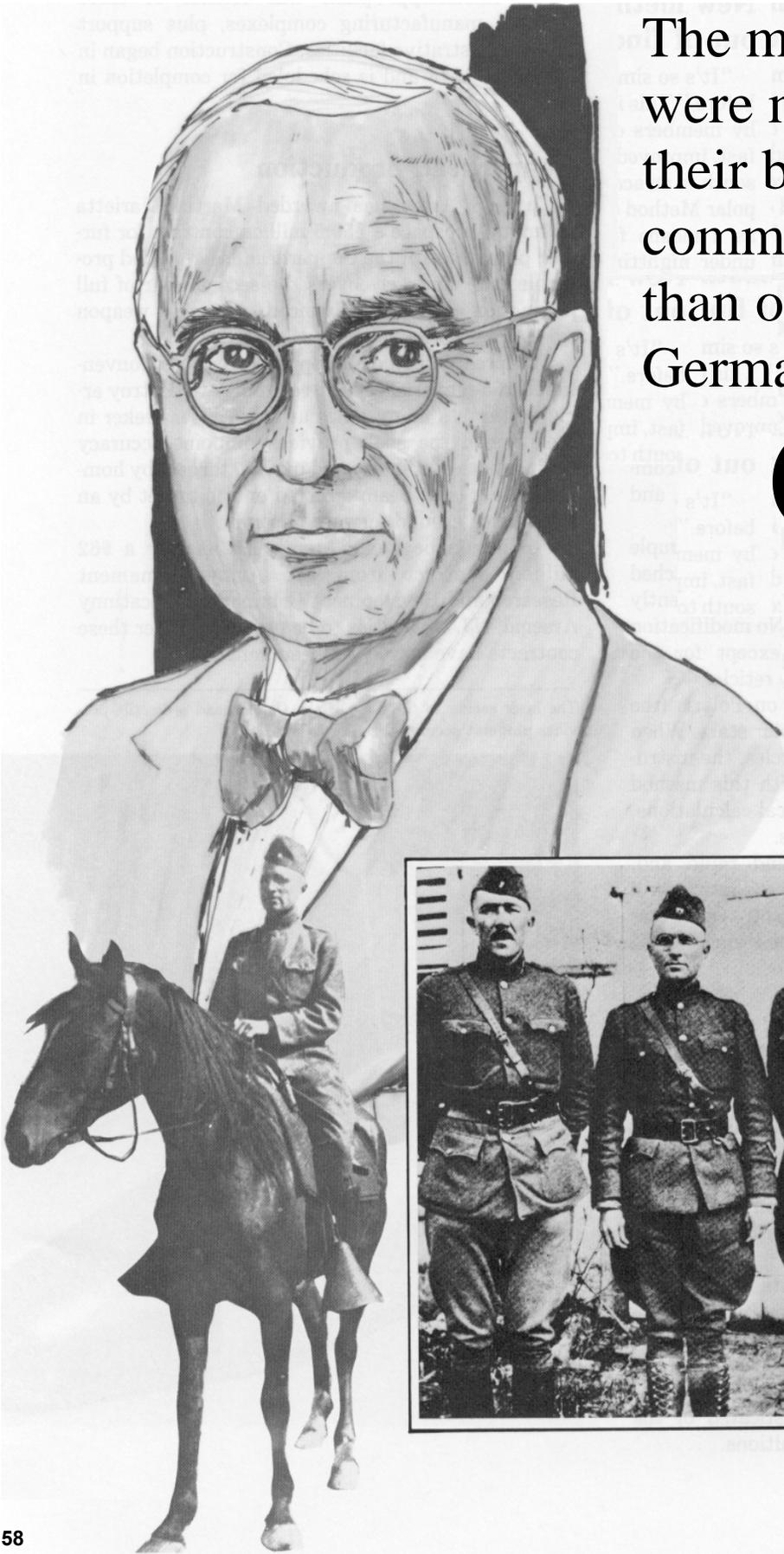
The laser seeker in the nose of the Copperhead projectile provides pinpoint accuracy.



The men of Battery D were more afraid of their battery commander's wrath than of the Imperial German Artillery.

Captain Harry

by CPT David T. Zabecki



In October 1939, the Senate War Investigating Committee made an inspection tour of several Army posts in the southern United States. Upon arrival at Fort Sill, members of the committee were ushered out to the range to observe service practice and the escorting officer (knowing the committee chairman's background) offered: "Senator, you are an old artilleryman; want to fire a problem?" Without hesitation, the chairman took the field glasses, observed the initial round, and called for a deviation correction of 50 mils. He then resorted to an obsolete World War I method of bracketing; i.e., he established two overs, made a range correction, and got two shorts. He then split the bracket and called for two more rounds. The result was two targets. As he walked away, flashing his characteristic wide grin, Senator Sherman Minton of Indiana said to him, "Harry, you couldn't have done that; those boys knew where to set the guns to get a hit, and they didn't pay any attention to you."

Harry S. Truman began his military career on Flag Day 1905 as a charter member of the newly organized Battery B, 2d Missouri Field Artillery, where he served two 3-year enlistments as a Number Two Cannoneer on a 3-inch light gun. The battery met once a week at its Kansas City armory where each man was required to pay 25 cents for the privilege of drilling (for field training on weekends, the unit had to rent horses from a local moving firm). As a cannoneer, Truman was proud of his dress blue uniform; however, the first, and only, time he wore it to his grandmother's house, she ordered him outside, saying, "This is the first time that a

blue uniform has entered this house since the War Between the States, and don't ever come back here wearing it again."

Truman left the National Guard in 1911 to help his father manage the family farm. However, in 1917, the United States declared war on Germany and MAJ John C. Chiles asked him to rejoin his old unit to help recruit the men necessary to bring it up to mobilization strength. Soon thereafter, he put his family's affairs in order and reenlisted.

He threw himself into the recruiting effort and subsequently became the principal organizer of Battery F in Kansas City. With his previous experience, Truman hoped he would become a section chief, but the men of Battery F had other ideas. In those days, National Guard officers were elected by the enlisted men and, when the ballots were counted, Harry S. Truman was nominated to become a first lieutenant. On 5 August 1917, the 2d Missouri Field Artillery was mustered into Federal Service as the 129th Field Artillery, 35th Infantry Division, and joined the other 35th Division units at Camp Doniphan, located on the Fort Sill Reservation.

As a new Field Artillery officer, Truman worried about his lack of formal mathematical training, so he launched his own independent study course of algebra and trigonometry and sat in on classes at the Artillery School in his spare time. His efforts paid off because he was soon appointed as the principal gunnery instructor for the 129th.

In March 1917, Truman was selected as a member of the 129th's advance party of 10 officers and 100 enlisted men. The group sailed from New York on the *SS George Washington* (the same ship that later carried President

Wilson and his party to the Versailles Peace Conference) and landed in Brest on 13 April. Soon after arriving in France, Truman was promoted to captain. Under the command of COL Richard Burleson, Truman and the other 129th officers spent five weeks at the II Corps Field Artillery School at Montigne-sur-Aube, where French instructors explained the intricacies of the "French 75," with which the 129th was to be armed.

Captain Truman rejoined his regiment at Brain-sul-l'Authion and was assigned as S1 of the 2d Battalion. The 129th then moved to Angers for advanced training at Camp Coetquidan, a former Napoleonic Artillery base. Truman did not like being a staff officer; so, when his regimental commander asked him if he wanted a firing battery, he said yes without even asking which one. To his dismay, on 11 July 1918, he was assigned to Battery D, a captain's graveyard, which had gone through three battery commanders since it arrived in France.

Battery D had a well-earned reputation for being totally unmanageable since most of the men came from a tough Kansas City neighborhood near Rockhurst College, a Jesuit school. Truman immediately launched the uphill fight to bring the battery under control, but the turning point came during an incident that Truman later called the "battle of who run."

In mid-August, the 129th was ordered to the front in the vicinity of the Vosges Mountains in Alsace to participate in a gas barrage on the night of the 29th. To avoid compromising his primary position, Captain Truman moved his battery to a supplementary position and then had his Farrier Sergeant take the horses back to

the primary position, with orders to return at the scheduled completion time of the barrage.

Battery D opened on schedule and fired 500 gas rounds in an hour and a half. German artillery had begun counterbattery fire, but Truman's position had not been located by the time the barrage was completed. Unfortunately, the Farrier Sergeant was half an hour late returning with the horses and German counterfire was closing in. While they were trying to march-order, two of the guns got bogged down in the mud and German fire began falling in the battery area when Truman's horse fell and rolled on top of him. Another round hit the position and someone screamed, "Run by God, they've got us bracketed." Panic ensued, and almost the entire battery started heading for the rear on foot. Truman struggled out from under his horse and screamed after his men at the top of his lungs. He was never known for mincing words and he probably didn't spare any in this situation; the fleeing soldiers returned under heavy German fire and march-ordered the guns. In the final analysis, the men of Battery D were more afraid of their battery commander's wrath than of the Imperial German Artillery. Incredibly, the battery suffered no casualties, although six horses were killed. Thereafter, Captain Truman had no problem controlling Battery D.

In September 1918, the 129th supported the 35th Division in the Muse-Argonne offensive. Battery D opened fire at 0420 hours on the morning of the 26th and, for an hour, participated in one of the most massive artillery preparations in history. Because of the high rate of fire, Truman fired only three guns to allow the fourth gun to cool 10 minutes, during which

time the crew swabbed the tube with water-soaked blankets. The preparation ceased at 0520, but 10 minutes later a rolling barrage, preceding the infantry, was initiated. Battery D continued to fire until 0741 hours when the infantry exceeded their range and control passed to the 128th FA. Battery D had fired 3,000 rounds in a little over three hours.

The next day, Truman displaced his battery forward and proceeded ahead to establish his observation post (this system was very similar to the current Soviet system of a battery commander and his combat outpost). He had just established his position when he noticed a lone American airplane dropping target marking flares to the west of his position. Scanning the area with his field glasses, he could see a German battery set up in the open, less than 1,000 meters away. Truman checked the location on the map and found that it was across the division boundary in the 28th Division's area. Furthermore, his unit was not designated to receive missions from aerial observers, but Truman quickly assessed the tactical situation. The 28th Division had been held up in the Argonne Forest and was considerably behind the 35th Division; therefore, the enemy battery posed a serious threat to the 35th's left flank. Truman did not hesitate as he sent the mission to his battery. Just as his regiment was calling down to reprimand him for firing out of his zone, Truman called "fire-for-effect" and the German battery was destroyed. Two days later COL Richard Burleson passed through the area and told Truman, "You got them all right; we came through and saw all six abandoned guns there."

On 30 September, the 1st Division relieved the 35th, but the

129th remained in support of the 1st Division until 3 October. On the 10th of November, Battery D was in position north of Verdun, near Forts Vaux and Douamont. Writing in 1954, Truman described the day of the Armistice and its aftermath:

"On November 11th at 5 a.m. Major Peterson, the regimental operations officer, called me and told me that there would be a cease-fire order at 11 a.m. — that was November 11, 1918. I fired the battery on orders until 10:45 when I fired my last round on a little village — Hermaville, north east of Verdun. The last range was 11,000 meters with the new D shell. Eighty-eight hundred meters was the extreme range of the 75-mm gun with regular ammunition, but with the streamlined D shell it would reach 11,500 meters.

"We stopped firing all along the line at 11 o'clock November 11, 1918. It was so quiet it made your head ache. We stayed at our positions all day and then crawled into our pup tents that evening.

"There was a French battery of old Napoleonic 6-inch guns just behind my battery position. These old Napoleonic guns had wheels six feet in diameter and no recoil mechanism. They'd run back up tall wooden contraptions built like a carpenter's saw horse, and then run down into place again. If a gunner got in the way, either going or coming, he'd lose an arm or a leg or any other part of his anatomy that happened to be in the way of the old gun. It was a good gun, though, and would hit the target if laid by an expert.

"Along in the evening, all of the men in the French battery became intoxicated as the result of a load of wine which came up on the ammunition narrow gauge. Every single one of them had to march



by my bed and salute and yell, 'Vive President Wilson, Vive Capitain Artillerie American.' No sleep all night, the infantry fired Very pistols, sent up all the flares they could lay their hands on, and fired rifles, pistols, and whatever else would make a noise all night long.

"Next day we had orders to leave our guns in line and fall back to the echelon. After that we spent our evenings playing poker and wishing we were at home.

"On December 7th a number of officers were given a leave. I was one of them. We went to Paris where we spent three happy days. I attended Manoa at the Grand Opera House, went to the Comedie Francais to hear Caruso, and to the Follies Bergeir; a disgusting performance. Then we went to Nice, stayed at the Hotel Mediterriane, saw the American Bar in the Hotel Negresco and the one in the Rhule et Auglee, visited the Casino at Monte Carlo, but we couldn't play because we were in uniform. They gave us a five Franc

chip and that's all we had from the famous gambling hall.

"We had lunch one day in the Casino de Paris. There were about seven or eight of us sitting at a big round table in the rear of the place, when all of a sudden every waiter in the place rushed to the front and began bowing and scrapping and we were informed that Madam la Princesse of Monaco had come in. Our colonel was facing the front and could see the performance. He watched very closely and pretty soon he reported, 'Oh hell, she's taking beer. Can you imagine a princess drinking beer?' It gave all of us common people a letdown."

In February 1919 the 35th Division was reviewed by General Pershing and the Prince of Wales (later to become King Edward VIII and then the Duke of Windsor). The unit sailed for home on 9 April and landed in Hoboken on 20 April. On 6 May 1919, Major Truman and the rest of the 35th Division were mustered out at Camp Funston, (Fort Riley, KS) which by no means ended Truman's association with the US Army.

In January 1920, Truman joined the Officers' Reserve Corps and between 1923 and 1933, he participated in the two-week annual training periods, mostly with the 443d FA and the 381st FA. He was promoted to full colonel in June 1932 and retained his commission throughout the years of his political career. He was always proud of his branch (Field Artillery) and his technical skills in artillery. When Congress passed the Selective Service Act in 1940, he felt obligated to contribute to the expanding Army. He went straight to GEN George C. Marshall (his future Secretary of State) to request reassignment to active duty.

The Chief of Staff asked him,

"How old are you, Senator?"

"Well, I'm fifty-six."

"Harry, you're too damn old," Marshall shot back, "you had better go back to the Senate where you can do more good." Crushed, Harry S. Truman returned to Capitol Hill.

Truman's one big military ambition was to become a general officer. He never reached that goal, but he did surpass it. A scant five years after he was thrown out of General Marshall's office, Harry S. Truman became the Commaner-in-Chief of all US Armed Forces. As President of the United States in the last days of World War II, he made what was undoubtedly one of the most significant military decisions in the history of the world — the decision to employ nuclear weapons to bring the war to a swift conclusion.

During his tenure in office, Truman always did and said what he thought was right, even if no one else agreed, which often got him into trouble with the public. The low point of his popularity came when he relieved General of the Army Douglas MacArthur from his command in Korea.

Truman was the last man to ascend to the Presidency with only a high school education. He often said: "I've always been sorry I did not get a university education in the regular way, but I got it in the Army the hard way . . . and it stuck." ❌

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