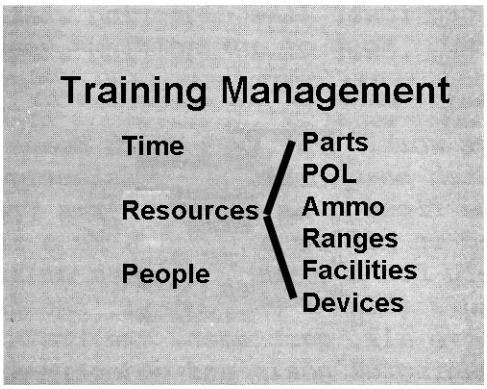
PRESENTATION BY MG GORMAN
ARMY WAR COLLEGE CLASS 76
CARLISLE BARRACKS
5 March 1976

While I get rigged up here with all my portable appurtenances I want to put to you ---a problem. Think or write down the three most difficult barriers to effective training management in the United States Army. Just get that fixed in your mind. (pause) Did anyone choose TRADOC? (Laugh)



I suspect that virtually all of you, if your experience parallels mine, would on first considering an answer to a problem like that I just posed, respond something along these lines:
Training Management, as most Army officers perceive it, deals with this. Old FM 21-5, Training Management for the U.S. Army, really treated these sorts of problems. And these are real problems and as you will see in a minute; they are increasingly difficult problems for the Army to solve. But what I want to suggest at the outset, gentlemen, is that this framework for analysis is no longer adequate to the present day because this perspective in effect looks at only part of the problem: Micro-management of training.

In order to attack the training problems of the U.S. Army today you have to have a larger view, a view that encompasses the set of considerations on this next slide. It is these considerations with which Army Regulation 10-41 expressly charges the TRADOC. It is with these considerations that TRADOC works most of the time. Now TRADOC has instruments for attacking the micromanagement problems as well. We have certainly not operated in ignorance of, or by avoiding the smaller problems. Yet it is in the area of macro-management that the Army has been in the most difficulty over the years. Concerning system design, gentlemen, you cannot build a training system for the Army that you would prefer to have. All of us have attended service schools in the past where we were told from the platform that we should forget everything we had learned out there in the field because units don't have the word, were doing it wrong, and we should learn the way it ought to be.

No, You have to deal with the Army that IS as a matter of first urgency as you design your training system. On the other hand, you cannot allow your system to stagnate. A proper Training System deals with a number of variables. The variables are moving constantly: doctrine, concepts, weapons, people, inflation, and affordable resources. All of these are moving, and you've got to be able to build dynamism into the Army training system in order to address those constructively, progressively. The system must be accountable. No Army can tolerate a state of affairs where its service schools or its training base operates in isolation, ivory tower like, ignoring what's going on out there in the serving Army. Most of our soldiers spend most of their time in units. Therefore, the training system has got to encompass both what occurs in the training base and what occurs in the units. If it doesn't do that, it’s not working right. Which means that those of us who wear the TRADOC patch have got to be constantly aware of what is actually going on in the field. That Combat Arms Training Board to which Col Bullock referred in his introduction, is a mechanism established by AR 10-2 expressly for building linkages or accountability into the training system. And I think I can report that there's been some modest success by CATB. Above all, gentlemen, the training system design must be directed at meaningful goals and objectives.

Of course you are well aware, from having heard General DePuy, that it is our contention that the prime objective of the training system of the U.S. Army should be effective weapons systems performance. Whatever else we do in the U.S. Army we have got to produce weapons that deliver steel on target. Everything else --organizations, tactics, techniques-- must be subordinated to the business of producing that lethality. If we are not lethal, we have not discharged our basic responsibility to the people of the United States and the Congress. And, of course, in this era, the issue of return on resources invested becomes more and more urgent.

What I want to do at the outset is to run through a series of slides that illustrate each of the foregoing considerations. But let me point out that I am addressing problems not in micro-management terms, but rather in a kind of macro-management view; I am asking you to think with me "how do you solve this from the Departmental level?" Understand that by Army Regulation General DePuy is charged to overwatch these matters for the Chief of Staff; therefore, much of the planning that used to take place in the Army General Staff addressing these issues of training is now occurring at Fort Monroe, Virginia.

PERSONNEL TURBULENCE
(ALO-1 CONUS DIVISION)
SAMPLE TURNOVER RATE

6 MONTHS	
1 BN	58%
1 BN	70%
1 BN	50%
1 YEAR	
1 BN	95%
1 BN	100%
1 BN	83%

Let's look at some of the real world problems out there in today's Army. All of the figures I'11 show you are recent samplings: six months or recent in currency. What these figures tell you, gentlemen, is that the training system of the U.S Army has got to deal with a high degree of mobility among personnel. That: is a reality. These particular figures are from CONUS battalions afflicted with the disease called Brigade 75, nonetheless illustrative, because they are from an actual division of the U.S. Army. When I commanded the 1st Brigade of the 101st Airborne Division in Vietnam in 1970 and 1971, I used to tell visitors that half of my platoons were wandering around the woods, operating against the best light infantry in the world, led by officers and noncommissioned officers who had been graced with their rank within the year. Everybody in those platoons entered the Army in the same year. By 1971 the Army had run through its combat arms noncommissioned officer cadres. The situation, gentlemen, has not improved appreciably, as you can see in this particular division.

2D ARMORED DIVISION
COMBAT ARMS STRENGTH (PERCENTAGE)

	E1-E3	E4	E5-E8	TOTAL
11B	168	72	69	99
11C	128	82	40	84
11E	182	617	34	109
12B	340	72	68	146
13B	143	87	79	112
16P	686	37	19	75

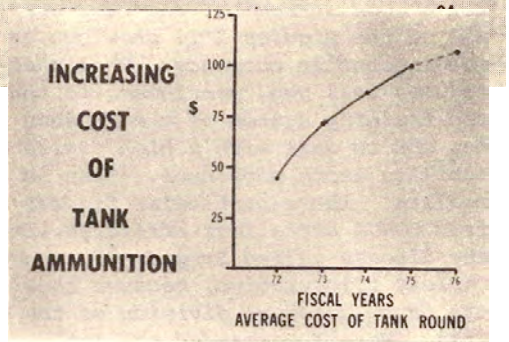
NOTE: ALO 1 DIVISION (105% OVERALL) BOTTOM HEAVY

Here is another sort of reality in the modern Army: within specific weapons systems, key weapon systems like the tank, a high degree of man-mobility. Most of the men who sit behind the guns of our tanks are in their first enlistment and over half of them have never fired more than one full gunnery qualification exercise in their lives. We have an Army of neophyte tankers. Yet this is the Army that we must stack up against the group of Soviet forces in Germany.

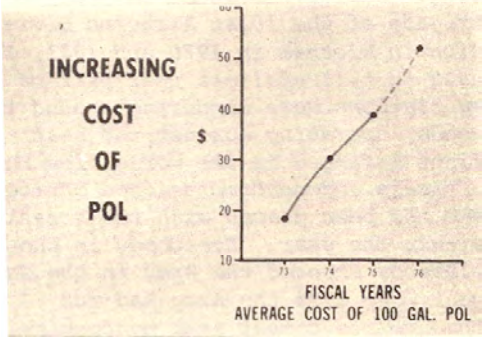
BN "A" CREW TURBULENCE
7 MONTHS
(PERCENTAGES)

CHANGED CREW POSITION		LEFT COMPANY
93	TC	59
96	G	39
83	D	37

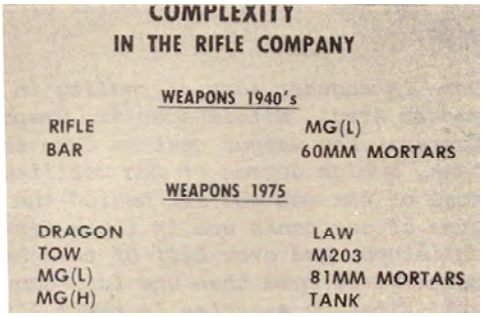
Here are some of the resource considerations that we are looking at. This year some $100 million will be spent on tank ammunition for training. Costs are going up. The Office of Management and Budget, the Congressional staffs, and the DA staff who have to look at procurement choices, are confronted with hard and difficult problems related to support of training. Every time we reach for increased lethality in the tank system via more practice we run into this kind of consideration.



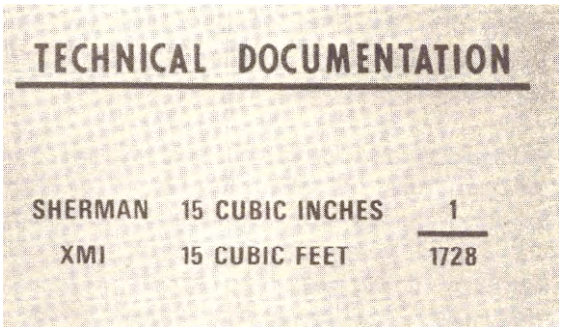
Maneuver training is expensive. The commander who wants to get out and teach overwatch, who wants to teach soldiers to use the terrain, who wants to get across notions like those General DePuy advanced in his recent talk with you, confronts these kinds of costs. And tied to this obviously there is a parts cost tail: as he drives his vehicles, he is putting wear on them.



Here is a relationship that is not often appreciated by some officers today. When I talk with certain WWII commanders, like famous airborne generals, I often find one who doesn't understand why we are having the problems that we encounter in the modern Army getting weapons systems proficiency down at company level.

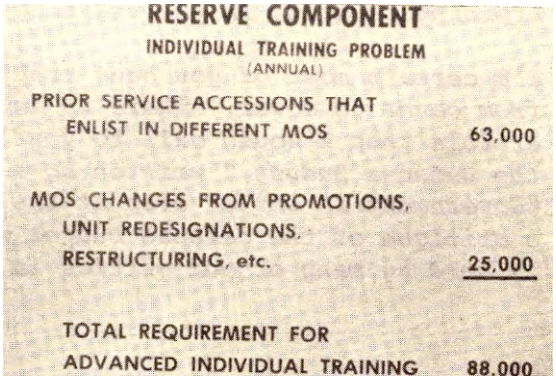


The fact of the matter is that the Captain today faces a more difficult training equation by a geometric factor, say square or cube, than the captain who trained a company in the old five-oh-whatever parachute infantry in the 1940s. Now you have to understand, gentlemen, that it is not simply the introduction of weapons into the training equation of the company commander that has engendered complexity. There are also radios, night vision devices, sensors and the like. You have to understand that there is a job complexity associated with these changes. The basic rifleman of the U.S Army 11B skill level I, must be able to perform anyone of more than 20 jobs out there in the rifle company. If you look at the tables of organization and equipment, you will see set against 22 or so of very different: positions in TO&Es, l1B skill level 1, 11B10. Yet TRADOC trains in the training base only three of those jobs. The company commander on the job must train the other 19. We do not train machine-gunners in the training base. We do not: train radiotelephone operators, etc. So there is a degree of complexity of on-the-job training that goes beyond what is suggested by this comparison with World War II airborne infantry.



In the maintenance side of the house we are facing a paper blizzard. When the Army fielded the Sherman tank in the '40's, we put out one slim technical manual. By the time we get to the XM-l we will go beyond where we were with the Sherman by a factor of nearly 2000. Now, if you expect your mechanics to refer to their technical documentation, and I see no escape for that --after all the XM-l is going to have a digital computer on board; it's going to have a gas turbine engine in it; it's going to have hydraulic and electric systems unlike that of any tank that we have ever had in the inventory—so use of technical documentation is going to be crucial to performing crew maintenance, let: alone organizational maintenance. How in the world are we going to come to grips with carrying around an Encyclopedia Britannia full of information for tankers in the field?

I do not want to neglect the Reserves. I want to tell you that: the fundamental problem in the Reserve Components is Individual Training, MOS qualification. The Army builds that problem into the system. The DA has directed that 68% of this year's recruitment in the Reserve Components shall be prior service soldiers. But recruitment in the Reserve, as you know, is a local proposition. The man is usually recruited into the unit that is closest to him, and most often he is recruited without regard to the formal training he received when he was on active duty. So we build into the system an MOS mis-match. Those figures suggest that, order of magnitude, we take in annually 90,000 soldiers that have not had formal training for the MOS in which they are actually serving in the Reserve Components. You have to take that one into consideration any time you hear one of our leaders talking about the importance that: is now attached to Reserve readiness.



Now on the issue of resources overall, I use the following painful construct to suggest how one ought to look resource allocation for the training system of the US Army. You know, we soldiers do not even have a vocabulary adequate to talk training management among ourselves, let alone to the Office of Management and Budget or the Congressional staff or to the DOD staff. Most Army officers talk about unit Training and Individual Training, just those two categories. As a matter of fact, you have to use terms that distinguish carefully who is being trained from where he is being trained. There

are profound differences, as those of you in the training business well realize, between addressing the problems of training an individual, and training a group or "collective" where teamwork figures. And then you have to have terms that tell where training occurs, because service schools are environmentally quite different from units as far as training goes.

$(P2, P8, RC) Expenditures
FY 76

WHO	WHERE: Institution	Unit	Total
Individual	25%	12%	37%
Collective	1%	62%	63%
TOTALs	26%	74%	100%

Resource allocations are shown in this chart as percentage of the totals in direct expenditures for training in Programs 2, 8 and Reserve Components (which amounts this year to about a billion dollars overall). I have not taken into account costs for training ammunition, parts or POL; if I did the figure would be somewhere, order of magnitude, three to four billion, but I haven't computed that out. I'm just looking at direct expenditures. Of those, 25% goes into Individual Training in institutions, 62% to Collective Training in units. You might say that's probably pretty right. But I want you to note that, in my view, this area, individual training in units, is pretty critical to the U.S. Army. It goes directly to that problem of Reserves, to the problem of the company commander who has to deal with the complexity of the weapons systems within his organization, and with the flux of personnel through his organization. It goes directly to the fact that we cannot, and do not train in the training base, most of the jobs for which the soldiers are sent to the field to perform. Now you might very well say, "Why not? Ought we not expand or improve our training capacity in the training base?"

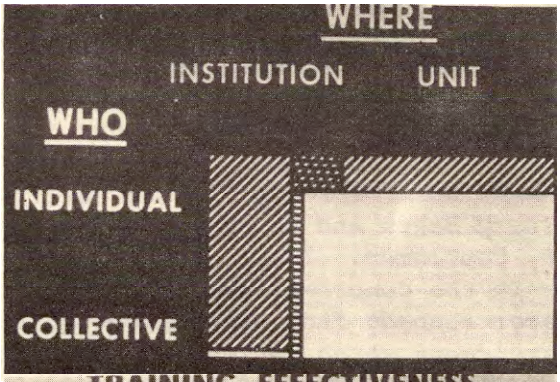
I'm certain most of you have read the latest issue of Foreign Affairs from cover to cover. There is in the January 76 issue an article that I would call to your attention. Its entitled "Controlling the Defense Budget," written by a couple of guys that belong to the "Government in exile" over at the Brookings Institute, and they present a critique of the defense budget which I think puts forth the view which is held by many of our critics in Washington, the conventional wisdom of our day.

If I may, let me read a little bit of this. "All told, if the average pay of defense manpower had increased since 1968 by no more than the average rise in the private sector, the 1976 defense budget would be approximately 7 billion dollars lower than it is." They go on to attack the pay scales of the Army and say "unfortunately higher pay scales did not produce any notable offsetting economies in the use of defense manpower. On the contrary, the number of military and civilian personnel employed to man, train, direct, sustain and otherwise support each combat unit is now substantially larger than it was ten years ago. This has aggravated the effect of higher pay on the defense budget. In part, the higher tail to teeth ratio can be explained by advances in technology, which, as in private industry, generally go hand in hand with needs for more people to maintain and operate equipment. Other reasons are not so easy to understand. It is taking an inordinately long time to shrink the large support establishment built for the Vietnam War, particularly to close excess military bases and to cut back the training establishment."

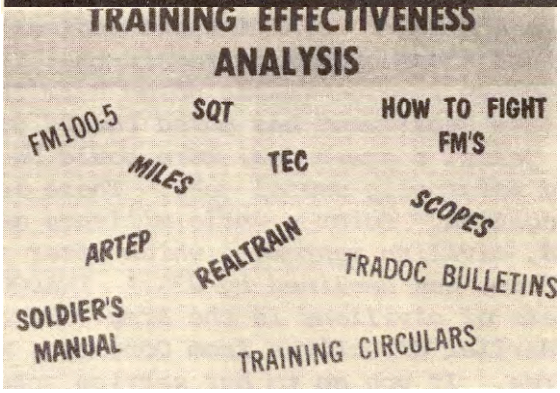
Note that last item, gentlemen. It is a theme that comes up again and again. Last June in the congressional action on the Defense Appropriation Act, Senator Kennedy from Massachusetts tacked on an amendment that would have fixed statutorily the ratio of students to instructors in the service schools. And some of the Kennedy premises are reflected in this particular article. Reading further: "Defense manpower policy is an area in need of reappraisal, if not radical surgery. Today military pay and allowances, civilian pay, military retirement pensions, together account for more than one half of the defense budget. Training and medical care raise the proportion to 60%."

Most of these critics regard that last 10% as an area in which they can carve freely without doing harm to the military body. "While the Defense Department has moved toward greater efficiency over the past two years, a great deal more could be done to eliminate unnecessary or only marginally useful jobs. There is persuasive evidence for this allegation. Point -while military manpower has declined by 40% since 1968, civilian manpower, which after all only supports the people in uniform, has declined by 23%." TRADOC, gentlemen, is one of the largest hirers of civilians in the Army. We are a TDA organization; responsive to earlier directives from Congress, we had civilianized to a remarkable degree. If you go to our service schools, you'll find a large proportion of the instructor force is now civilian. And the attack on the civilian manning of the Army' is having a drastic effect on our ability to keep our schools and' our training base in operation.

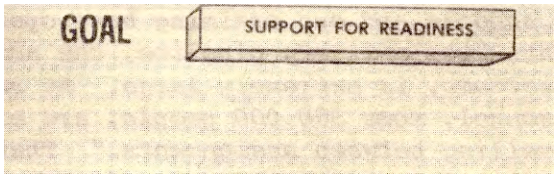
And now two last paragraphs. Point, "The military pipeline, the number of people in transit or in classrooms, is extremely large. At any one time, 1/7 of all military personnel, some 300,000 people, is either in formal training courses or traveling between assignments." That sneering remark, gents, is directed at you. As a matter of fact, in the Army the figure is about 1/8. This year we'll have 112,000 military man-years invested in the training base of the Army. Final paragraph. "Military training schools are too costly. The ratio of students to instructors and support personnel is 1.5 to 1, a much lower ratio than exists in any other educational community in the country. Colleges for example run at 15 to 1 ratios, while the ratios in vocational schools, which are probably the closest analogy, run from a minimum from 2 to 1 to well over 100 to 1."



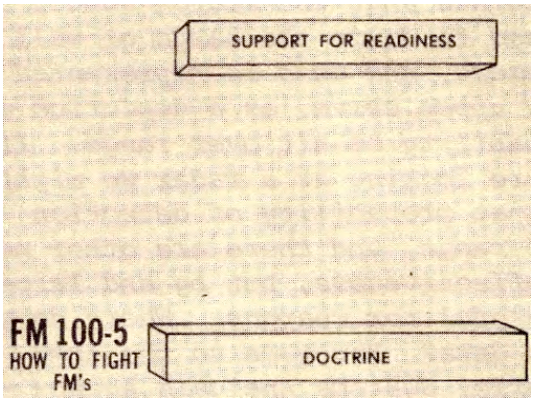
I'm not quite clear whether one refers to the Army War College as a vocational school or college, but be aware that you are subject to criticism in Washington. And the resource depiction that I presented to you earlier, presented graphically on this slide, is being attacked for the very large expenditures of resources in this area of institutional training. As these guys would have it, this area (individual training in institutions), must shrink and we ought to put more over here in unit training. Interestingly, Senator Proxmire and others then picks up a cudgel to hit at that side of the game, asking questions about expenditures in Program 2 on training, so the Army is being attacked from both sides.



In any event, those are some of the dynamics in macro-management that we are 'trying to address in the TRADOC. We have devised to get at them, a sort of an array of nostrums and remedies with curious names and new titles... And there's a lot of folks out in the Army, if not in this room, who regard all of the several things we're doing as part of the problem, rather than part of the solution. And, I must say, the bewildering flurry of paper and new gimmicks and gadgets, etc., out of the TRADOC is probably confusing to the troops.

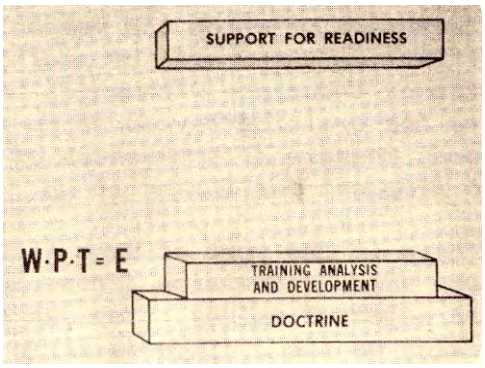


What I am going to do today is try to put all that into some sort of coherent whole. We start out with the issue of goals, our objective. I want you clearly to understand that just like General Rogers' command, General DePuy's command, by DA order, is directed at the goal of readiness. Everything we do gets measured up against that.

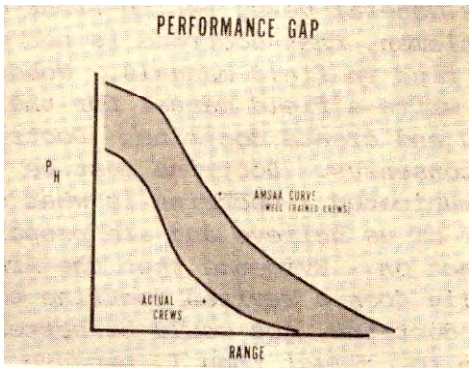


Now we start down at the bottom with the sort of conceptual propositions that General DePuy put in front of you. And I'd make the important point, gentlemen, that doctrine is not alone what you find in field manuals. Nobody can write a field manual for the U.S. Army and thereby create doctrine. Doctrine is consensus. Doctrine must be communicated for understanding. Doctrine is what over half of us believe and are prepared to act on. Evidence that the Army really does have a revised doctrine or a new doctrine, you would be better able to assess than I, because you talk to more division commanders than I do in the course of the year. If a corps commander appears before this 'body and makes noises like General DePuy made at you, then we've got a doctrine; if otherwise, not. And you've got to understand that virtually everything that TRADOC is trying to do in this area of doctrine is in effect consensus building.

Now we bring to our work on doctrine a thorough consideration of matters pertaining to training. Let me impose on you this construct, paradigm, or model, where we say that effectiveness in battle is a function of the capability of the weapon -what you build into your materiel --the proficiency of the individual or crews who man it, and the tactics or techniques with which it is employed. It is obviously this area (P, T) that we operate on with the discipline that we refer to as Training Developments. For those of you who are interested in getting the flavor of what we mean when we say the discipline of training development, I would refer to you this document, TRADOC pamphlet 71-8. It is called "Analyzing Training Effectiveness," and it takes this model and discusses how one attacks training issues directly, using it.

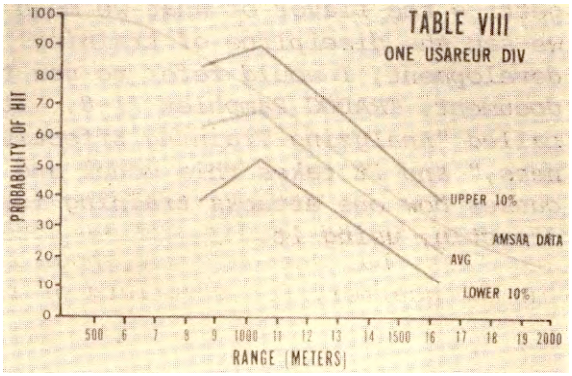


I'm going to show' you here some examples from our recent work in Training Developments. This is the general proposition for any given weapon system. It is possible to postulate what the weapon should be expected to do in the hands of well trained crews, and this is represented by this upper curve, as a depiction of probability of hit over range. If

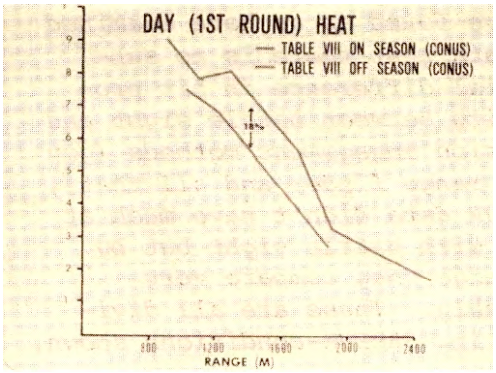


Were we looking at a radar, we might look at probability of detection over range, and there are other measures of effectiveness, but by and large this is useful for weapons. Where do you get such data? You turn to the Army Materiel Systems Analysis Agency —these are the representations that we make to the Congress when we purchase the materiel. This curve is what figures in the procurement business. These are the data that are used in our war games and models, when, in the Combat Development process, we look at product improvement or newer weapons systems. These AMSAA curves are very important in the. Combat. Developments process. The Training Developer starts by asking how is the Army actually performing with the weapon in the field. He goes out and. He collects data, not alone representations by commanders (which are notoriously inaccurate), but what the crews can actually achieve firing the weapon. Usually he finds that there is a gap between what the crews can actually hit, and the accuracy of which the weapon is capable: a gap induced by either a shortfall in the P area (proficiency of' crew), or in the T area (tactic or technique with which they are employed) or both. And it is up to the training developer to isolate those, determine cause, provide remedy, measure effectiveness of remedy, cost of remedy and come forward with a proposal for fixing performance to close the gap.

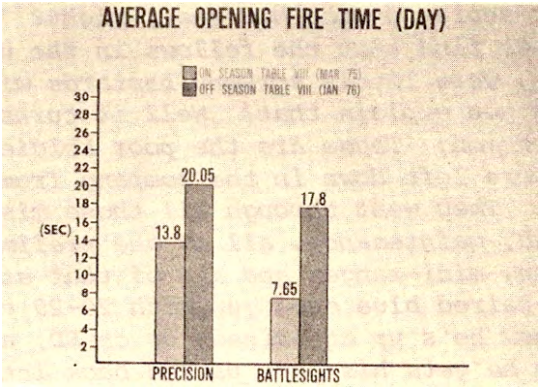
Now here is the sort of data that the training developer collects. These are data on one USAREUR division firing in the past few months. Second from top are the AMSAA-expected values. You can see that the division on the average is firing 10% below the capability of the weapons system. But note also that a substantial number of crews in the division fired well above the expected value, and a substantial number of crews, as might be expected, fell well below. The difference between the upper 10% and the lower 10% is fully half of the weapons systems capability. Now what the training developer does is try to find out what makes the guys in the upper 10%, what· is it about them that is different from the fellows in the lower 10%. Now back there in the room there are iron heads who know the answers to that. They will tell you the people up here in the top 10% will be the people with superior visual acuity, higher GT scores and higher scores on the MOS test, right? All wrong. The truth is exactly the opposite. We find that the fellows in the upper 10%, at least on this sample, were little scrawny bastards with glasses, not very bright. How do you explain that? Well it turns out that there is a very easy explanation. These are the poor soldiers that nobody else wanted. They were left down in the company from one end of the year to the other. They went through all those miserable drills that tankers go through, maintenance, all of the preliminary gunnery tables at home station, mini-ranges and all of that stuff. The bright guys — the blond haired blue eyed guy with 20-20 vision and a year in college, you know he's up at brigade or on SD, and right



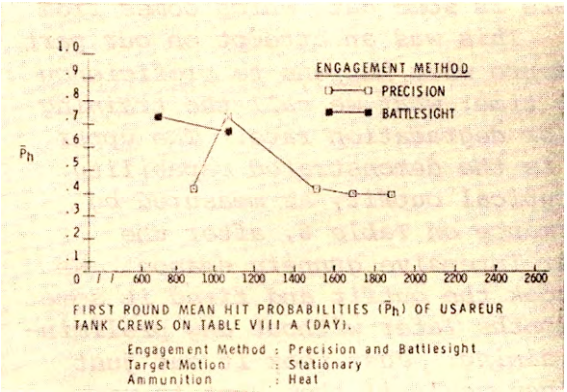
before the gunnery season he gets his butt packed back into the company, and he ends up down there in a new-formed tank crew which has trouble shooting. Training managers have got to know that because this is the sort of clue that shows us how to push this curve back up to where it ought to be. In any event, that's an example of how to attack the problem.



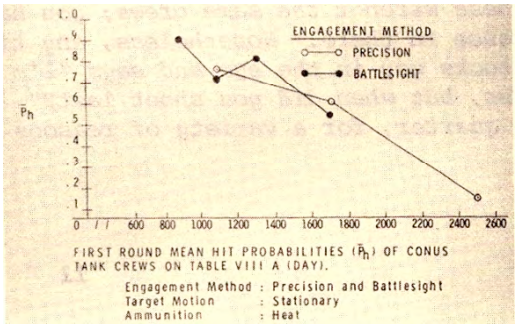
Now here are some data that comes from CONUS. This was an attempt on TRADOC's part to measure what happens to proficiency P over time: what we call the training decay or degradation rate. The upper curve is the demonstrated capability of a typical tank outfit, as measured by performance on Table 8, after the regular intensive gunnery season. We then took the same unit and fired it some nine months later without any preliminary training…just sent it out on the range just like the unit would be sent were it being sent to war. There the unit shot and scored a representative sample of tank crews. And as you can see, out here in the range band of great tactical interest, there was a significant degradation in probability of hit. About 18%, as a matter of fact, of the weapons system capability. Now, I must tell you of course that these weren't the same crews; we had to account for personnel turbulence. Nonetheless, any time one of those tanker leaders out there looks you in the eye and says "I'm C-l in training readiness" you say "Yes, but when did you shoot last?" And if they haven't fired within the quarter, for a variety of reasons, they just might have lost their edge. Now there are ways of keeping this gap closed month in, month out. There are ways of doing that, and that's of course what the training developer goes after.



Here is another set of interesting data from the same events. These deals= with the decay of opening time, of alacrity within the crew as a result of that nine months of no practice. The left pair of bars records precision fire methods, and the right set, battle sight. If it is true that he who shoots first, survives better (and that is assuredly true based on every bit of evidence that we have been able to garner from the battlefield in Israel or from our combat development models) then we have here a very important factor for training managers to have in view as they plan their tank gunnery program. Speed falls off faster than accuracy.

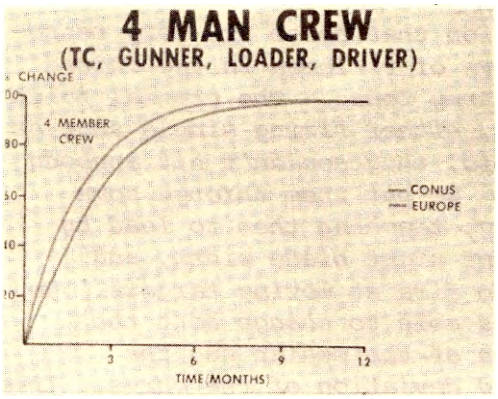


We have found as we have examined various data sets that there is no substantial difference in probability of hit between battle sight and precision engagement methods (you know, range finder and all that). USAREUR data didn't cover much at range with battle sight, but by and large the two methods compare very favorably. These are data from all divisions in USAREUR under the conditions shown (stationary, HEAT).

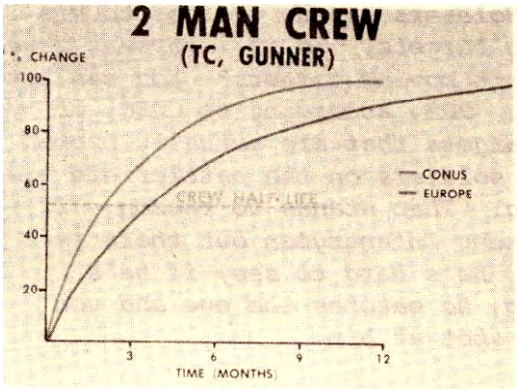


Here are the same data for CONUS. CONUS divisions shoot battle sight out to much greater ranges, and as you can see, there is little difference in accuracy between battle sight and precision engagement methods. But battle sight is substantially faster, as we noted from an earlier chart. What then should be the training technique, the tank firing doctrine of the US Army? Obviously, battle sight out to 1600 meters range. Confirmation, you see, from high-density data gathered in actual firing all around the Army by TRADOC training developers.

I mentioned that tank crews experience a degradation of skill over time, and that personnel turbulence was an important factor. The data suggest that it may, in fact, dominate. I wanted to show you these slides simply to get across to you that there is no substantial difference within the tank units of the Army: all are subject to turbulence, whether they are stationed in CONUS or in USAREUR. A crew gets on this curve, incidentally, when anyone of the four members of the crew changes. After three months, as you can see, there has been a change in over 3/4 of all tank crews.



Now if we look at just the tank commander and the gunner, the two key members of the crew, we find that there is still a very substantial degree of turnover. I call this the crew half-life, and by that I mean that in this period of time, three months, over half of the crews will have had a change of either the gunner or the tank commander or both. Again, fellows, calculate what that must mean to the training manager. Any time you hear anybody talking approvingly about annual tank gunnery put a question mark in your eyeball, because he hasn't thought through the problem. If the Army is really interested in readiness, meaning what its units can do on the battlefield today, it must think in terms of something other than an annual event on Table 8.



Now here is a comparable problem. These data are from the Combat Development Experimentation Command in California, a TRADOC test agency, looking at modification of the rifle to increase shot dispersion, and discovering a training gap. The subjects were 20 ordinary soldiers pulled out of AIT at Fort Ord, after they qualified on the M16 rifle. CDEC found that almost all had difficulty hitting moving targets

CDEC TEST

SHOT PATTERN DISPERSION AGAINST CONCEALED TARGETS

PRIMARY PURPOSE: TEST MODIFICATIONS TO M16A1 RIFLE TO INCREASE SHOT PATTERN DISPERSION.

OVERLOOKED PROBLEM: SOLDIERS COULD NOT HIT MOVING TARGETS P_H=.12

CDEC then conducted a side test to measure hits against moving targets, and established that, at an engagement range of 200 meters, the average riflemen could hit with less that 6 out of ten

SIDE TEST *1

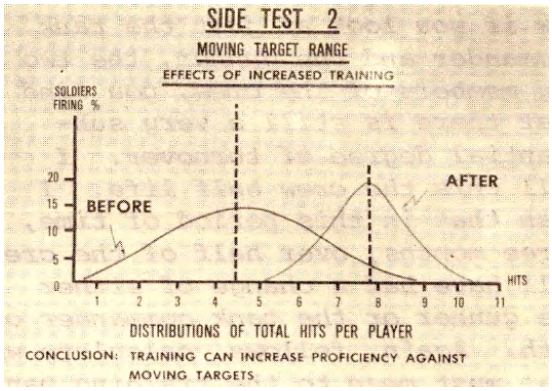
MOVING TARGET RANGE
M16A1 AT 200 METERS

	STATIONARY	MOVING
SEMI-AUTOMATIC	.58	.12
AUTOMATIC	.27	.09

* AVERAGE TARGET HIT/TARGETS PRESENTED

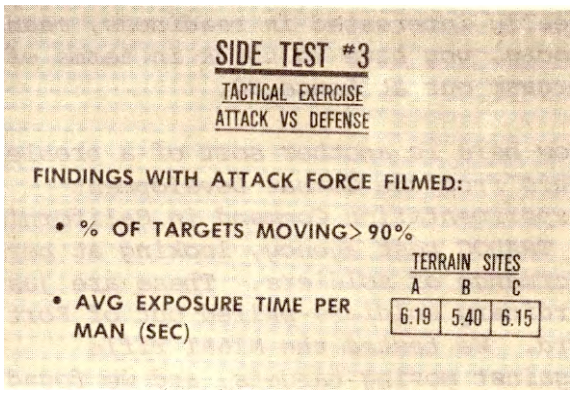
shots with his rifle set for semi-automatic fire, and less that 3 out of ten shots when set on automatic. This was the actual capability of those soldiers. AMSAA says the M16A1 should hit stationary targets at 200 meters with eight shots out of 10. The crucial point is that, whether firing single shot or automatic, the riflemen had a slim chance of hitting a moving target. Based on all data in our possession, I believe that these subjects were very representative of riflemen in the United States Army today.

CDEC then put the subjects through additional training, teaching them to lead their target by the width of the front sight blade, and then let them re-fire the moving target range. The curve on the left is the distribution of total hits per player before the training, and the right curve, the performance after training. Note that the median is nearly 80% hits per player on moving targets, close to AMSAA data for stationary targets. CDEC showed that soldiers could be trained to hit moving targets. Is it important that they hit moving targets? You can bet it is.

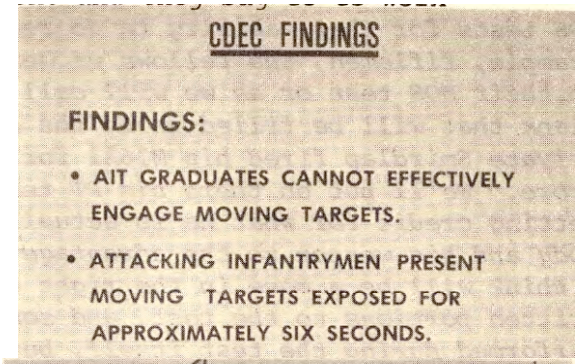


CDEC data from a third related test that are actually detected by soldiers on the battlefield are moving laterally with respect to the firer That stands to reason. If the enemy infantryman out there is still, he's hard to see; if he's moving, he catches the eye, and you get a shot at him. Average time to get that shot, based on three different pieces of terrain, is about six seconds.

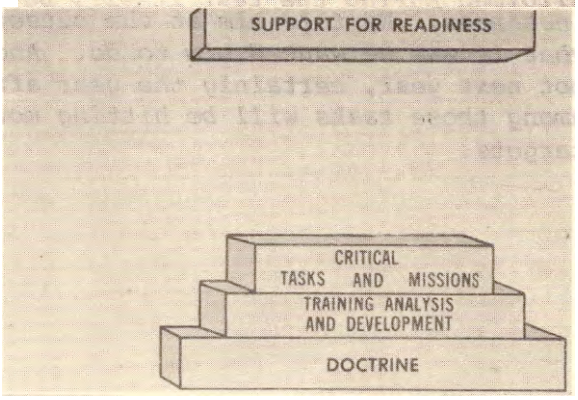
Ask yourself these questions: "How many moving targets have you ever fired at on a rifle range? "How many rifle ranges in the United States have moving targets?" "How many of us have ever trained soldiers to shoot at moving targets? I suspect that the answers to those questions, in this room, are “none.” It sure attests that "here there is a problem for training developments.”



There are the CDEC findings. These are the sorts of matters that TRADOC refers to as “training analysis.” Benning is right now grappling with this problem right now. When Training Developers find a problem, they remand it to the proponent, who brings to bear all of TRADOC's mechanisms, including telling DARCOM to develop the moving targets that are lacking, and working to improve the readiness of the Army for dismounted combat.

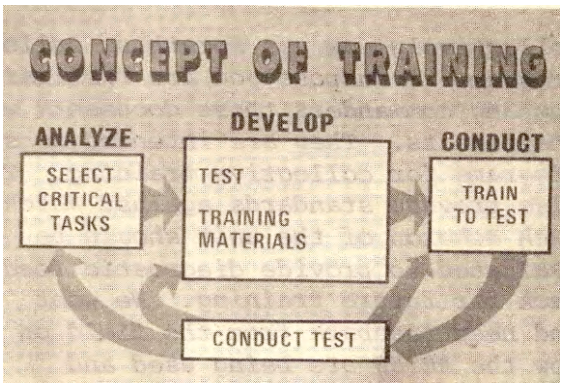


Now out of such training analysis comes what we call critical tasks. We define as a critical task that the rifleman be able to hit a moving target. Few in the Army train to master that task today. We've got to some how or other get that training started in the force. How to do that? The answer is to use an approach something like this. You determine the critical tasks, then you develop a way of evaluating whether the soldier can practice it or not. Some kind of moving target range is obviously indicated in

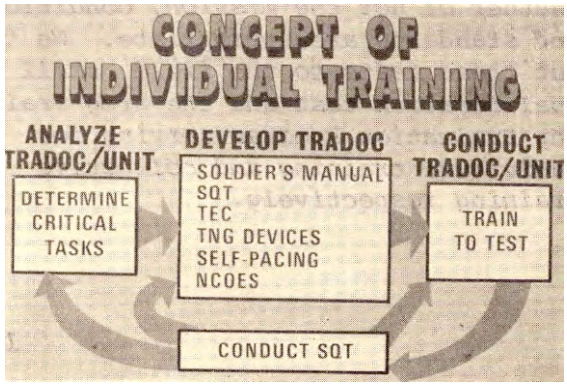


the M16Al case. You've got to develop the training materials, the moving targets for them to shoot at, and you got to get those out.

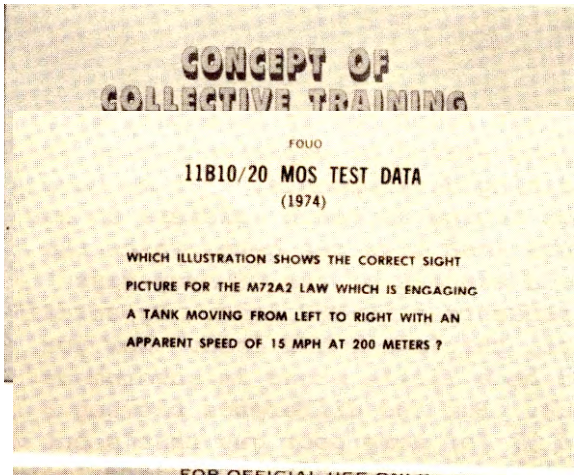
Then you tell the units "Hey train to that test." Conduct the test, evaluate and then hopefully, we get feedback to determine whether we were right in the first instance. Now we can translate that into individual training. TRADOC tells the soldier what the test is in his Soldiers Manual. TRADOC teaches it in the non-commissioned officer education system. TRADOC teaches soldiers about it through exported training -Training Extension Course -or other forms of nonresident instruction.



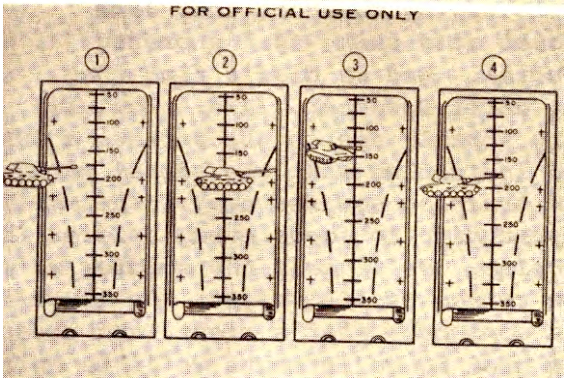
We are making progress with that concept as applied to individual training. Starting in May of 1977 for the first time, soldiers of the United States Army will be getting credit on their MOS tests for their ability to do real things on their job. For example, riflemen, the fellows we were just talking about, will have on their MOS tests — or as we will call them, skill qualification tests, SQT— a blank that will be filled in by the company commander that says that Private Smirdlap fired his M16Al for qualification with the following score. He'll put on there Smirdlap's PT test score so that the guy will be getting credit for what he is actually able to do by way of using his body and his weapon to the advantage of the United States Army. That I think will be a move in the right direction. There will still be written portions to the test, and some other performance items to be incorporated in the test itself, but hopefully we are taking him back to those critical tasks in all instances. We told him at the outset what it was we wanted him to do. And if not next year, certainly the year after, among those tasks will be hitting moving targets.



For collective training, TRADOC issues the Army Training Evaluation Program. I suppose you are familiar with ARTEPs, training guidance documents for battalion and company commanders, each designed specifically for branch. They are intended to serve as the basis of unit training programs ~or collective training. They also provide standards against which each echelon of the unit shou1d be evaluated to provide diagnostic feedback for future training. We want and need feedback from the field on how the ARTEP are being used, and whether or not the mission, condition and standards are appropriate. We then put these tests to the field, Skill Qualification Test and the Army Training Evaluation Program serving respectively for individual training and collective training.

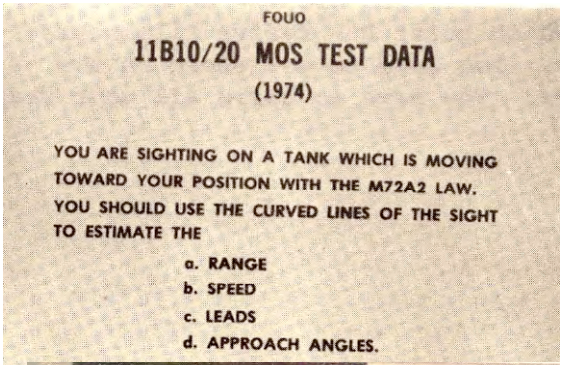


Here is the sort of data that suggested to TRADOC that the old written MOS Test had to give way to the Skill Qualification Test with practical events. In the written test, soldier being evaluated was given an illustration like that to the right. His task was to select the correct sight picture. This event was in the MOS test for five years running, and over those years the response was at or within a few percentage points of random chance. Nobody did

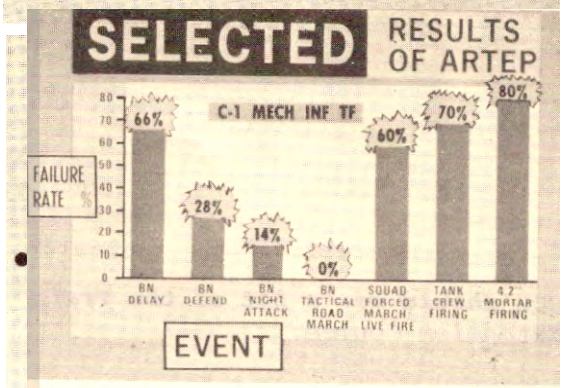


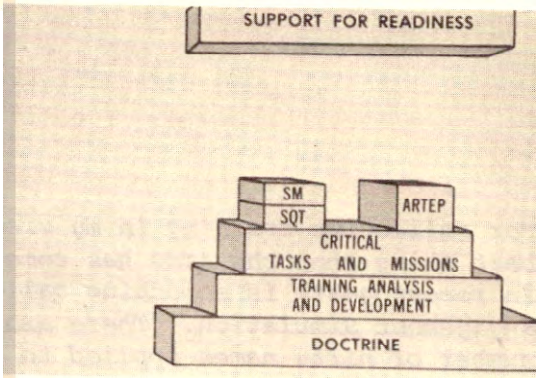
anything about it because the data was lost in the statistical maze of the test analyses, and in any event the MOS test served the personnel system for retention and promotion, not commanders for training or readiness. The init commander received a report nine months after the fact, saying that in the weapons area your guy did something like so and so compared with the Army median, a normative, not criterion reference. It did not say whether the soldier tested could fire the LAW or not, but rather how he did relative to everybody else. The Army needed to know that if a soldier selected the right sight picture, it was probably luck, not skill. The Army should of known about that training gap, and acted to close it.

Or how about this question from the same test. What's the answer to this question? ……Those are range, stadia lines; less than half the Infantrymen tested knew that.

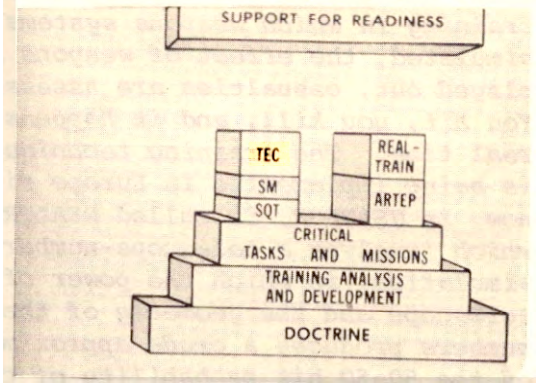


One final example: TRADOC just found out in December, after a long period of experimentation in training developments, that we have been trying to teach soldiers to use these lead tics out here, which the 'field manual says represent that lead for a target moving at 15 MPH. lead. By actual test, that's a 6 MPH lead. Now you 'can be a little wrong in government work. But the difference between 6 and 15 MPH is pretty crucial for some poor guy that's out there trying to shoot that 66mm rocket at a moving tank. And we didn't find that out until December 1976. As a matter of fact, when the Army retrofitted all the LAWS just a short time ago, it could have fixed this sight up at the time with a 10¢ piece of plastic —but nobody knew we had a problem with it. You will very shortly see on the streets a TRADOC Bulletin describing these LAW tests, and indicating what the actual values are as one step in TRADOC's moves to get LAW training squared away. The Skill Qualification Test will give us an opportunity to focus every soldier in the Army, on the LAW problem, and TRADOC will know whether its fixes were apt. We'll tell the soldier we're going to ask you questions about how to use the LAW sight. We'll tell them what's right. We'll tell his commander what's right, and presumably everybody will train on it, and then by golly maybe we'll be on the way to having real LAW readiness.



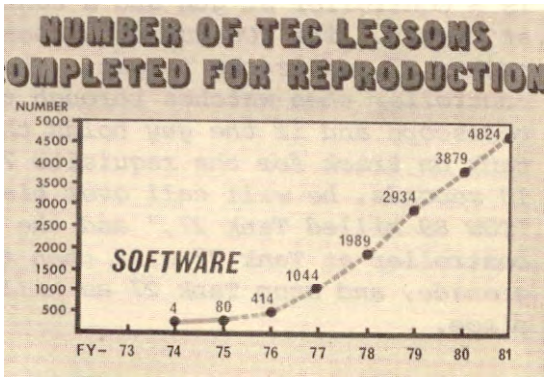


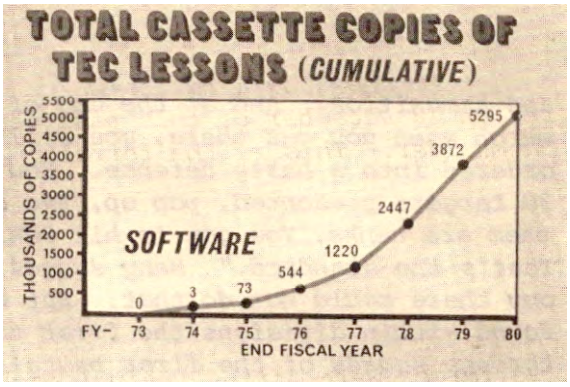
The Army Training Evaluation Program (ARTEP) does for collective training what SQT does for individual training. Here is ARTEP feedback data, this from all mechanized infantry task battalions with readiness ratings of Charlie One that we looked at in FORSCOM last year, teamed with the FORSCOM guys in the validation process. Everybody can do road marches. But notice this one in the middle: the squad forced march is an event in which rifle squads were picked at random from the battalion, and tested all by themselves: "Hey,



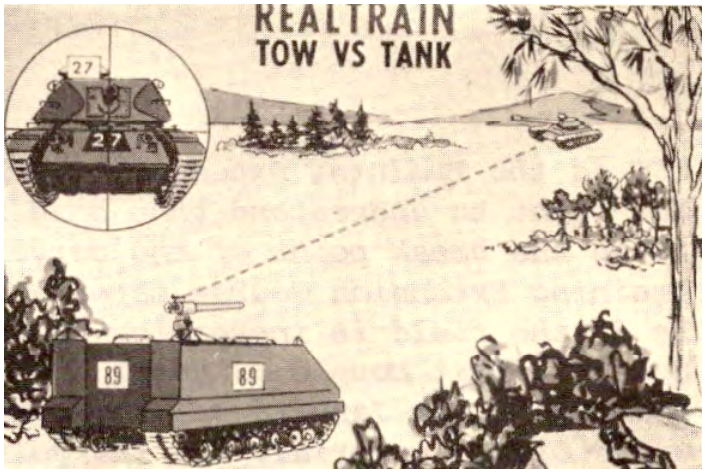
Sarge, you are now at point A. March to point B -twelve kilometers away. You have to get there in two hours. You have to carry all your weapons and ammunition. And at the end of the march when you get there, you will be ordered into a hasty defense. You will have 30 targets presented, pop up, two of them will be tanks. You have to hit 80%. That's the standard." Many squads out there could not do that. But we found within divisions that a squad that was the first in line of the first battalion evaluated (like that on the chart) would fail. Next battalion's squad would do better. After seven reiterations at Fort Lewis, most of the squads participating met standard. Because the word was around, Sarge had gotten the guys out and had marched, and he had practiced their carrying their basic load, and he had practiced shooting. Decentralized training had been incentivized, and TRADOC observed its beginning to take place. In any event we had given ample notice of the task and the standard. That's in the ARTEP. Then we go on to provide individual training materials and collective training materials. I want to talk about TEC and REALTRAIN.

TEC is the Training Extension Course. You ought to understand that TRADOC is only on the break point of the curve. The Training Extension Course materials will be in the field in increasing numbers over the next couple of years. The production for January was some 90,000 units of TEC material. So it's going out to the Army now in substantial numbers. When you get back out there you should see a lot of the Training Extension Course.

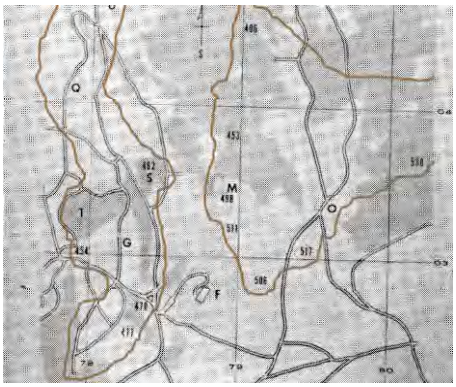




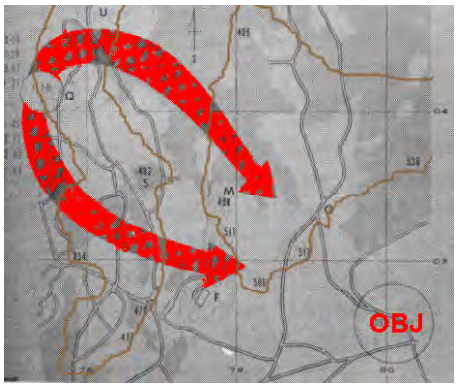
For collective training, in my view, the best thing that the Army has come across in recent years is something called Tactical Engagement Simulation. There are a number of nifty names applied to this, but all we are talking about is training in which weapons systems are simulated, the effect of weapons is played out, casualties are assessed, and tactical performance is evaluated. You detect a target, you hit, you kill, and it happens in real time. The training technique 'that is being implemented in Europe right now, in USAREUR, is called REALTRAIN, which involves a telescope-number simulation, in which the power of the telescope and the geometry of the numbers produces a crude approximation of the 50-50 hit probability of the weapons system. You squint through the telescope on top of the TOW and you read the number off the tank. There is a controller at gun and a controller at target. The TOW gunner announces number 27 and tracks target. The controller then watches through the telescope and if the guy holds the tank on track for the requisite 7 to 10 seconds, he will call over his radio "TOW 89 killed Tank 27," and the controller at Tank 27 will then toss a smoke grenade, and stop Tank 27 as killed in place.

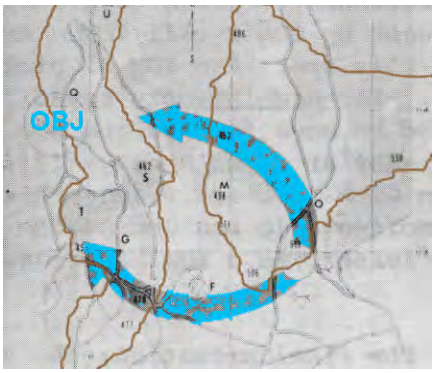


I want to show you a REALTRAIN battle that occurred on 18 December of this past year in Baumholder, SW of Frankfurt. The terrain held two N-S ridges, delineated by the 450m contour line, facing one another across a valley, with some scattered pine groves.

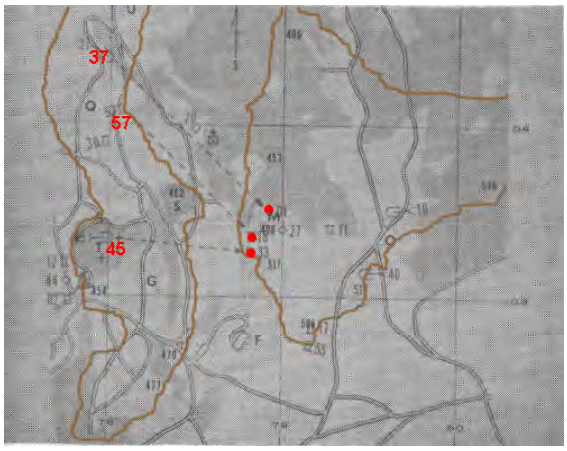


Two forces were pitted against each other. Team RED, was given a mission of advancing to an objective to the SW, beyond Hill 511. RED elected to break into two teams, and to advance on the axes shown. There were two tanks, an APC and a TOW in each RED team. Team BLUE was given an objective to the NW, where RED started. This exercise was designed as a one-on-one meeting engagement.

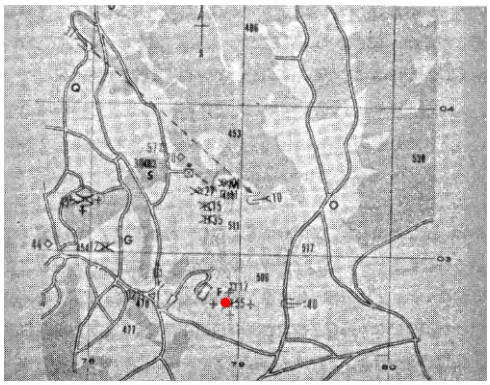




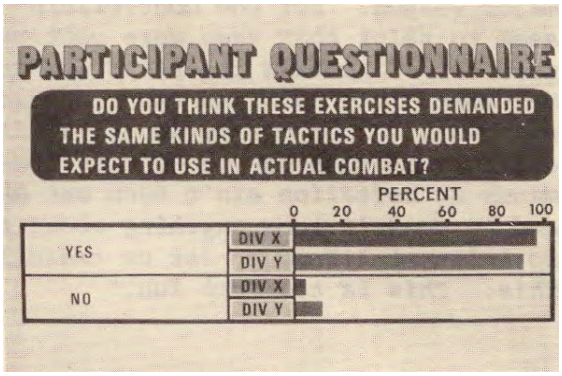
The battle developed as follows: BLUE attack set as an intermediate objective Check Point Mike, vic Hill 478, center. Half hour after jump off the situation was as shown on map at right. BLUE crested the ridge at MIKE, passing north of Hill 511. RED had dismounted an infantry squad into the edge of the woods across the valley. RED squad heard BLUE advancing, alerted RED TOWS and tanks to the rear, so that as BLUE came over the ridge it was ambushed. RED Tank 57 took out BLUE Tank 15, RED TOW 45 took out BLUE Tank 33, and RED TOW 37 took out BLUE APC. Vic Hill 478. The three BLUE vehicles hit are marked with red dots.



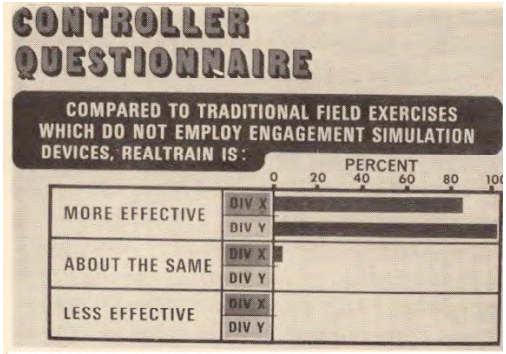
When Red TOW 45 fired, BLUE TOW crew called artillery in on Red TOW 45, and effectively suppressed it. They also engaged Red tank 12 as it came across an open space and knocked it out. But meantime, the RED infantry squad moved across the valley and succeeded in ambushing with LAWs and a 90mm BLUE APC 27, taking it out. RED also put artillery fire on BLUE tank 55, killed its loader and disabled the tank (red dot). For some reason BLUE continued to press toward Mike, and brought up their tail TOW. As he crossed this spot, Red TOW 37 picked him off. The Red Infantry squad continued to move forward and got another shot at a tank here, killing it again with LAWs and 90mm. This squad was led by the platoon leader in a real Audie Murphy action.



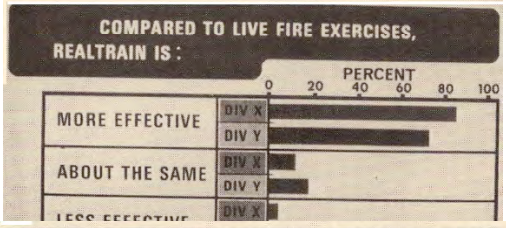
Here is the final situation: the Red force converging on the already crippled last Blue tank, and the remaining Blue tank and TOW. Two Red rifle squads came across the top of the hill and shot into the crippled tank, and at this point in time, the Chief Controller called the battle, awarded the victory to the Red, and then held an after action review in which the soldiers told each other what it was that they did wrong or right. They analyzed what it was that had led to their winning or being defeated. All of this took place in real time. In all, the actual fight took about two hours, the AAR perhaps another. But it was a very vivid example of the inter-relationships among TOW-tank, and infantry-armor. With REALTRAIN we are beginning to teach tactics in a very real way.



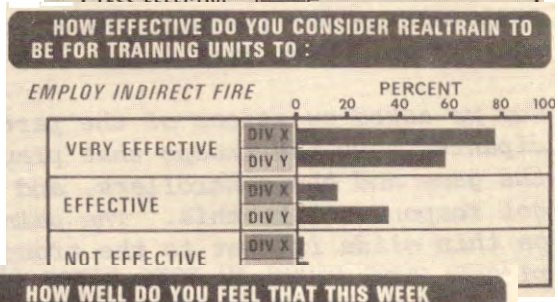
Then TRADOC asked questions of the participants, both the troops that participated and the controllers, from which there were responses like this (right). The point on this slide is that to the troops playing it, this simulation had face validity. Just last week I was in Friedberg talking to participants. I talked with a tank commander, an E6, you know one of those quintessential tankers --looks like a pot belly stove-- and he said, "I've been in USAREUR for 11 years in my career and I have been down Range 80 more times than I care to count. I know the range to everyone of those targets. Range 80 is simple compared to this. But now I know how to fight a tank."



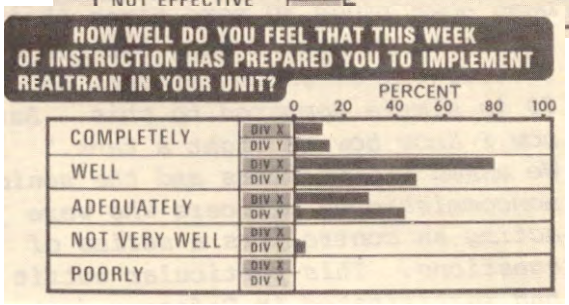
TRADOC then asked a series of questions of the officers and the senior noncommissioned officers who had been acting as controllers in REALTRAIN exercises in two different divisions of EUSAREUR. (Their unit had participated in REFORGER just this past year). In their view, REALTRAIN was superior to traditional field exercises.



Many officers looking at REALTRAIN said, "Yeah, but Live Eire exercises really teach tactics better." I agree with the Controllers that REALTRAIN is more effective than live fire because in Iive fire there is nobody penalizing you for ignoring concealment or cover, And in live fire you have to observe safety regulations. In contrast REALTRAIN puts a feeling in the pit of the participant's stomach that he is being watched all the time. It's very interesting to see how they behave.



There can be good artillery play in REALTRAIN, not as good as some would like, but the simulation rewards the use of indirect fire support. Artillery FO's got a good workout, and it teaches tankers and infantry-men to use artillery.



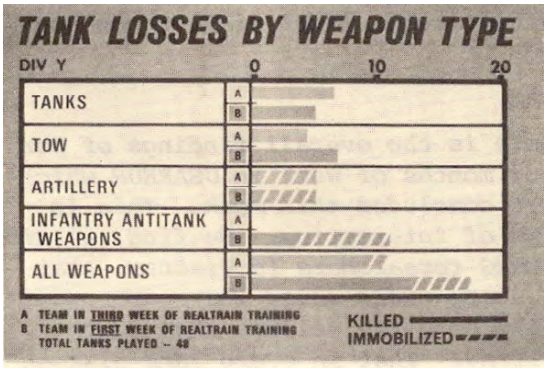
REALTRAIN is expensive in terms of controllers: one controller for every major weapon. TRADOC has hoped that officers exposed to it as controllers would become advocates, and that seemed to have worked. Indeed, the controllers seemed to think that they were getting more out of it than the participants. We probed into this, and the response was "Well I know how' to do it, but in effect that dumb so-and-so that commands my battalion ain't been out here, and he doesn't know anything about this, so he's not likely to let us train like this. This is too much fun."

This last question/response elicited a great deal of USAREUR attention. Why don't we train better? Pretty solid unanimity among the respondents in two divisions.

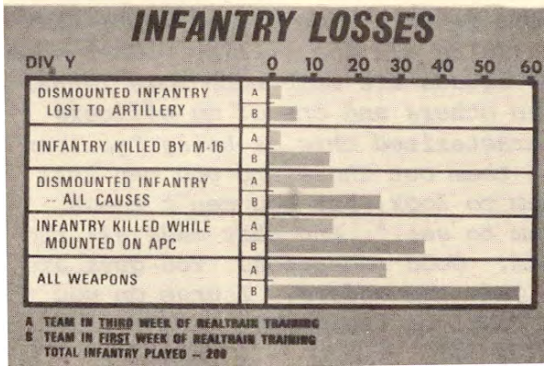
WHICH OF THE FOLLOWING ITEMS HAS GREAT IMPACT ON THE TACTICAL TRAINING PROGRAM IN YOUR UNIT--

	DIV X	DIV Y
NONAVAILABILITY OF PERSONNEL FOR TRAINING DUE TO ON DUTY EDUCATION, POST SUPPORT, ECT.	41%	41%
LACK OF POL OR TRAINING AMMO	25%	38%
LACK OF ADEQUATE TRAINING AREAS	31%	23%
MAJOR ITEMS OF EQUIPMENT DOWN FOR MAINTENANCE	12%	15%
PERSONNEL TURBULENCE DUE TO ROTATION OR REASSIGNMENT	9%	13%

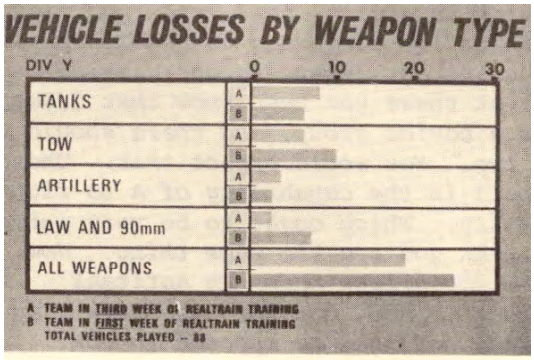
Now it is possible to quantify the outcomes of these REALTRAIN engagements, and to draw some conclusions about the validity of our small unit tactics. This is quite fascinating to TRADOC Combat Developers who are looking at it with interest. As a matter of fact, the latest tests of cavalry organization conducted at TRADOC's MASSTER test bed have used this simulation as the technique for measuring one cavalry organization against another. To understand you must know that Group A is an experienced group, group B is a novice group, and there should therefore be a difference between the two. You would expect that.



There is a substantial difference overall in the capability of A to fight effectively without losing infantry. OK, you look at tanks you see the same thing. Now this terminology "Infantry Antitank Weapons" is inept, but it refers to LAWs and 90mm as opposed to TOW. Note that Team A, the experienced team, had learned how to move without losing anybody to close-in infantry fires. They had learned to keep the enemy infantry away. They are a little more aggressive with the tanks, so that tank losses to other tanks doesn't check out, but overall they lost less tanks to all weapons. Incidentally, in this simulation there never was a case where anybody succeeded in attacking at 1 to 1 and winning. Even the experienced guy always loses when he attacks at 1 to 1. The defense and delay with TOW and tanks really proved to be the stronger form.



These slides represent two divisions worth of data. What these suggest to you is that TOWs and tanks have about the same loss ratio but the marginal efficiency of the TOW vs tank is higher. Again you would expect that because of TOW's greater range, but I show you this simply to establish that the simulation compared with actual weapons systems effect. These also compare quite favorably with the results that one might get if you were using a more sophisticated model like Carmonette.



There is the overall findings of our four months of work in USAREUR that just concluded this week. We find, as did HumRRO researchers in Vietnam, that in every rifle squad there are probably only two fellows that do the killing; that in every tank platoon there is only a couple of tanks that really get all the kills; that some TOW squads are very much more lethal than others. One of my officers characterized this as follows: "you can get them out there and you can tell them to look, but you can't teach them to see." And that made all the difference. High degree of enthusiasm. Good reception. You guys are going to be battalion commanders and brigade commanders. I urge that you take a hard look at the Engagement Simulation approach to tactical training.

REALTRAIN - EUROPE

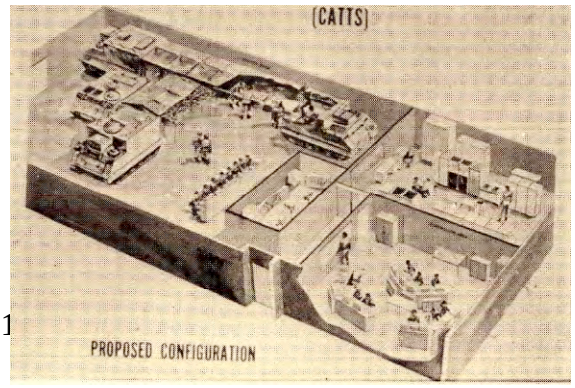
IMPORTANT FINDINGS :

- REALISTIC TRAINING
- IDENTIFIES "REAL" KILLERS
- SEPARATES SEE'ERS FROM LOOKERS
- FUN TRAINING

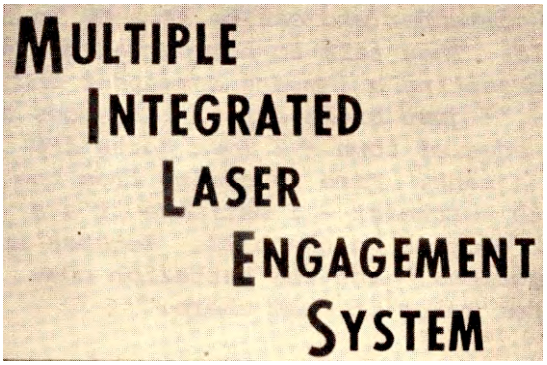
Here is another form of engagement simulation; tactical board games played for training. This is a game called EFFTRAIN. TRADOC took it to Berlin last June where it was well received. It's still being played in Berlin. It is a squad level game. Played with little squad markers. There are two terrain maps, the same on both sides. Neither player can see his opponent's moves. There is a controller who sees both, and the controller can put in artillery or other weapon effects, and adjudge the outcomes of engagements. As this is a map of their training area, so they can then go out on the ground, and do the same thing in a tactical exercise without troops. Finally they can then apply the REALTRAIN simulation, and that's the total training package.

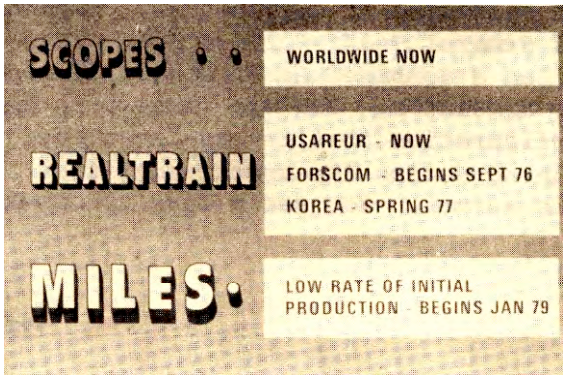
Here is another kind of game called LONG THRUST, a battalion level trainer. This is set in Europe, and is being played at Leavenworth and in FORSCOM. The apparatus is based on an analog computer with software that enables a big *Kriegspiel*. A hexagonal tiled terrain display controls maneuver, and the counters indicate weapons systems capability, firepower score, and maneuver speed of each tactical unit. Depicted are controllers acting as company commanders. Players are a battalion's battle staff. 'This photo was taken in Denver at a Reserve Component unit a couple of months ago. The controllers play a move on this apparatus, and then they get on the "radio" and report to the battalion commander, who can be at a CP in the field. They talk to him like a company commander. For example, "I just broke out of the woods at the edge of town. We lost three APCs and a tank. Fire is coming from the north-northeast. I estimate it's an enemy tank company on the hill. Request instructions," The battalion staff updates their situation maps, and the commander takes it from there.

CATTS (Combined Arms Tactical Training Simulator) is another computer-based game, now operating at Leavenworth's Command and General Staff College. It is shown here as it was at Fort Benning during its operational test this summer. You see on the left a mock up command post for a battalion, and on the right, a room for the high capacity computer, and a room for controllers playing the situation portrayed by the computer. The game takes place in about a 100 square km between the Mitla Pass and the Suez Canal, and starts with a defense of the canal. The controller can see all aspects of the battle on his display as shown. This is a real time, two-sided, free play, fully interactive, war game played for training. This spring students at the CGSC will actually get to on CATTS. CATTS participants who have acted as battalion commanders or 3's or fire control officers or 2's say that it is the closest thing to actual combat that they have ever experienced. I'll say one thing about it: the machine will go on forever, and it can run a battle staff right into the ground. It'll go just as long as the controllers want to keep feeding the situation into it.

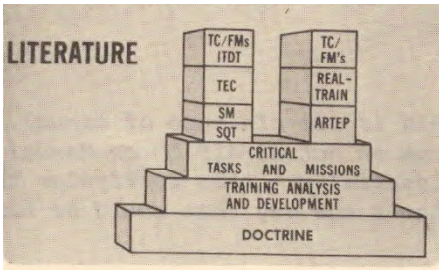


Now, beyond all of the foregoing training support innovations, TRADOC has been conducting research and development with advanced technology for enabling larger-scale tactical engagement simulation less onerous on units for personnel overhead. MILES uses eye-safe gallium arsenide lasers, each modulated to identify a shot from a particular direct fire weapon, integrated into an emulation of fires from a relatively large tactical unit with far fewer requirements for controllers. Soon the Army will be able to conduct free play, automatically umpired engagements: company versus company, or battalion versus battalion. MILES will supplement SCOPES and REALTRAIN, the telescope based systems for engagement simulation that are now in use. The acronym, by the way, is Latin “mil‘es” for “soldier.”





I'm not going to discuss literature in any great extent except briefly to cover a technical documentation improvement effort that TRADOC has under way with DARCOM.



The traditional approach to maintenance training and documentation, of course, has been to require the mechanic to bring a substantial amount of theory to his job, and to work with a Technical Manual (TM) with this theory in mind. This, along with the fact that TMs are written at too high a level for our soldiers readily to read and understand, produces problems that impair materiel readiness. Moreover, technical manuals were developed without consideration of the trainer, whether in TRADOC or in the unit.

PROBLEMS OF CONVENTIONAL TMs

- CONTAIN DECISION–TYPE PROCEDURES
- OFTEN INCOMPLETE
- SCATTERS PERTINENT INFORMATION
- DIFFICULT TO UNDERSTAND
- EXCESSIVE REFERENCES
- CONTAINS INFORMATION NOT REQUIRED
- HIGH ERROR CONTENT
- RELIES ON TECHNICIANS MEMORY
- NOT WRITTEN WITH USER POPULATION IN MIND

So what we are trying to do with the DARCOM is to address both problems simultaneously with something we call IT'DT.

DARCOM/TRADOC

IMPROVED TECHNICAL DOCUMENTATION AND TRAINING PROGRAM

- ITDT -

Those are the key features of the approach.

KEY FEATURES OF ITDT APPROACH

1. "FRONT END ANALYSIS" IS REQUIRED TO ENSURE THAT TECHNICAL INFORMATION IS SUCCESSFULLY COMMUNICATED.
2. VERIFICATION OF THE ITDT PACKAGE BY USER POPULATION PRIOR TO ACCEPTANCE IS CRUCIAL.

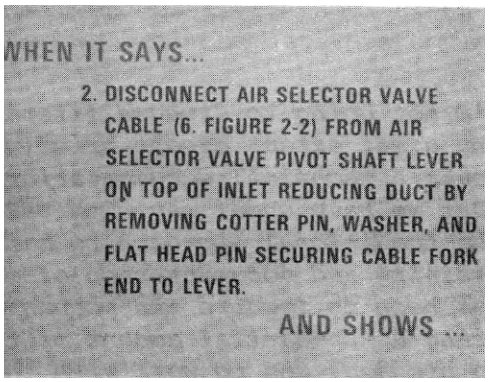
Ninety-four separate tests have been conducted by the Navy and the Air Force of this approach, and the results on the average were as shown on the chart. This is means reduced time to repair. If Readiness means operational availability of tanks, aircraft, artillery tubes, or whatever, ITDT seems to offer a lot of advantages. We are convinced that it does.

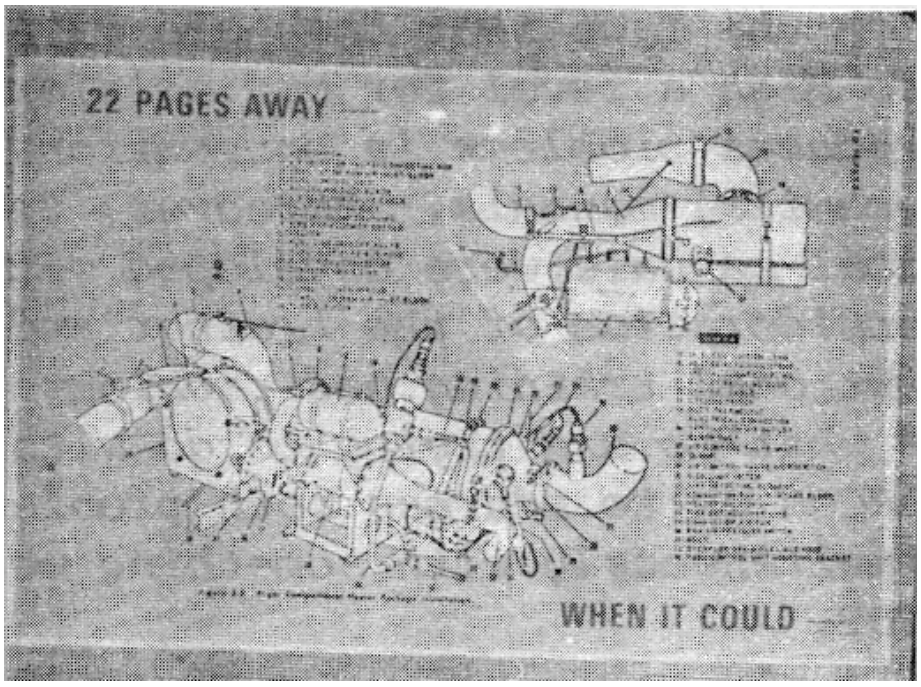
ADVANTAGES OF ITDT

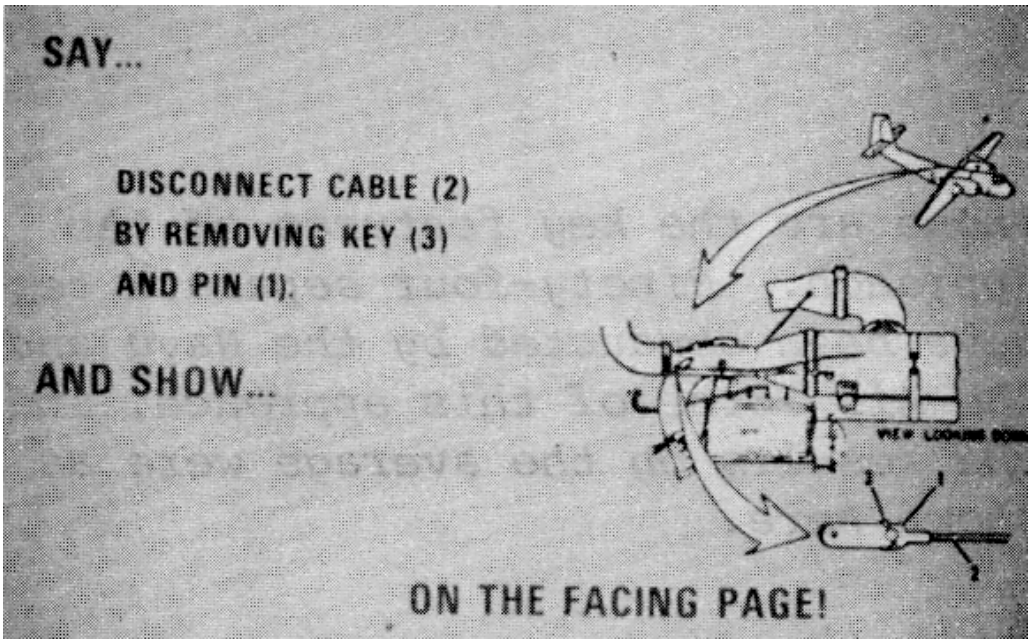
- REDUCE SEARCH AND RETRIEVAL TIME
- REDUCE ERROR RATE - 75%
- REDUCE MAINTENANCE INDUCED FAILURES
- IMPROVE QUALITY OF MAINTENANCE
- REDUCE SPARES DEMAND - 30%
- REDUCE SKILL LEVEL REQUIREMENTS
- REDUCE MANPOWER DEMANDS -35%
- REDUCE TIME IN TRAINING - 25%
- AIDS MAINTENANCE SUPPORT FUNCTIONS(SUPPLY SAFETY)
- REDUCTION OF NEW EQUIPMENT TRAINING EFFORT

THESE RESULTS YIELD AN OVERALL MTTR REDUCTION OF 40%

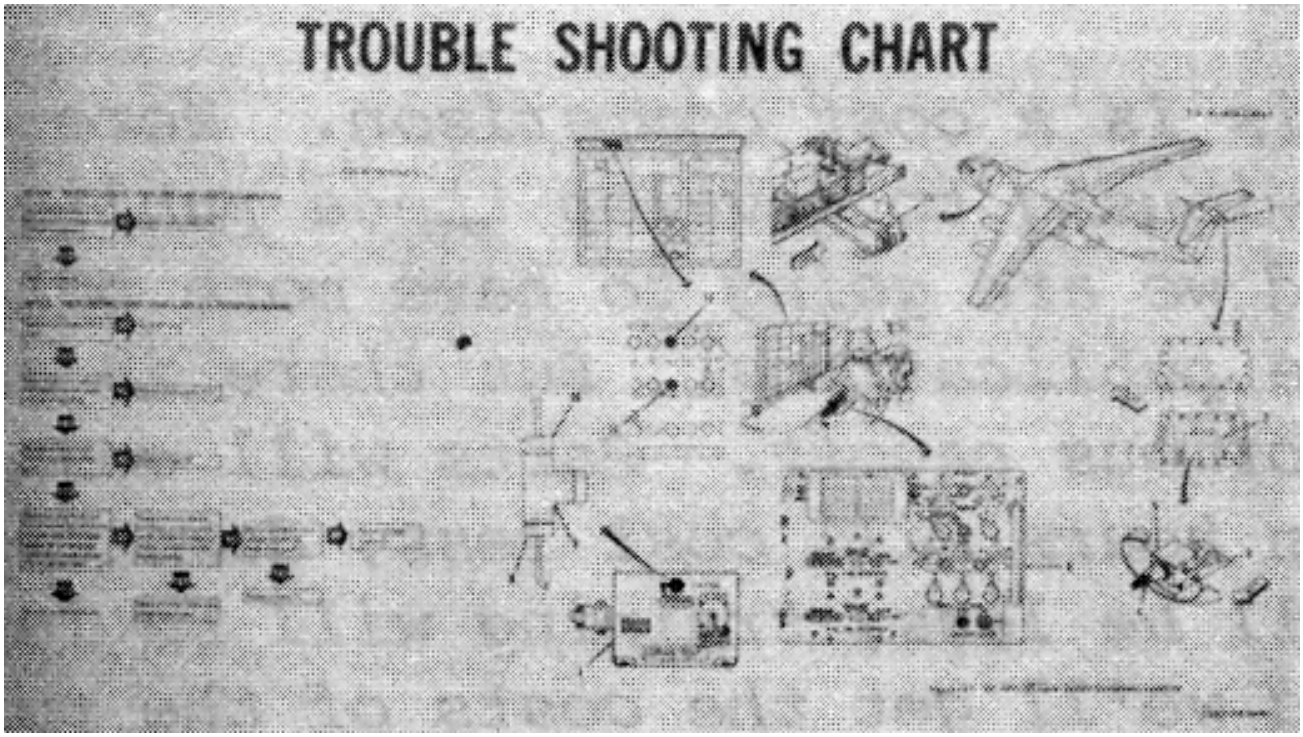
This example is from an old type, pre-ITDT of manual, an actual Air Force Manual: the instruction to the mechanic was located 22 pages away from an explanatory diagram that was itself not very helpful.







This is the way the new Air Force manuals look. This is the C-141A System. If you ever get near a C-141 ask to look at their embedded technical documentation. Lots of use of Decision Tree format. Simple procedure "yes, no? If yes, do This. If no, do that." The mechanic, thus guided, works his way through his choicest. The Air Force says this particular technical manual system has put the Cl41 back into the hands of the crew chief. Our Army needs a lot of such help.



There is the cover of a technical manual belonging to the US Army Engineers. Can you imagine sending anybody down to the orderly room to get one of those?

TM 5-5420-205-14

EPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL
OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT
AND GENERAL SUPPORT MAINTENANCE MANUAL
SUPERSTRUCTURE INTERIOR BAY, MOBILE
FLOATING ASSAULT BRIDGE/FERRY
FSN 5420-877-8682, CONDEC CORP.
MODEL 2195-1, COMPONENT OF INTERIOR
BAY UNIT FSN 5420-010-5191, AND
FSN 5420-017-8224, CONDEC CORP.
MODEL 2272 COMPONENT OF INTERIOR BAY
NIT FSN 5420-491-6339 SUPERSTRUCTURE
END BAY, MOBILE FLOATING ASSAULT
BRIDGE/FERRY FSN 5420-877-8684,
CONDEC CORP. MODEL 2195-2
COMPONENT OF END BAY UNIT
FSN 5420-010-5192, AND FSN 5420-017-8225
CONDEC CORP. MODEL 2271 COMPONENT OF
END BAY UNIT FSN 5420-491-6320

I just want you to read the first couple of paragraphs up there. I am absolutely convinced that somewhere down in the bowels of the Engineer School in 1972 there was one of those draft dissidents that was getting back at the United States Army.

4-27. QUICK DISCONNECT COUPLINGS, REPLACEMENT

A. REFER TO FIGURE 4-19(1) AND (2) FOR REMOVAL AND INSTALLATION OF HYDRAULIC QUICK DISCONNECT COUPLINGS.

B. CARE MUST BE EXERCISED WHEN INSTALLING QUICK DISCONNECT COUPLINGS THAT A GOOD SEAT OF THE BALLS OF THE FEMALE FITTING IS MADE IN THE GROOVE OF THE MALE FITTING ON THE TRANSPORTER DECK. TO CHECK THAT A GOOD CONNECTION HAS BEEN MADE:

(1) OPERATE THE PINNING, CURBING, ROTATION, AND FOLDING CYLINDERS AND OBSERVE WHETHER THE RELATED HYDRAULIC HOSE STIFFENS NOTICEABLY. IF THE HOSE DOES STIFFEN (INDICATING A PRESSURE BUILD UP), RELIEVE THE PRESSURE FROM THE HOSE. GRASP THE SLEEVE OF THE FEMALE COUPLING AND LIFT IT UPWARD AND OFF THE MALE COUPLING.

(2) OBSERVE BOTH FEMALE AND MALE COUPLING HALVES FOR DEFECTIVE O RINGS, DEFECTIVE BALL RETAINER, OR MISSING BALLS.

(3) REINSTALL THE FEMALE COUPLING ON THE MALE COUPLING AND AGAIN OPERATE THE CYLINDER. IF THE HOSE STIFFENS, RELEASE PRESSURE AND INSTALL A NEW FEMALE COUPLING ON THE HOSE.

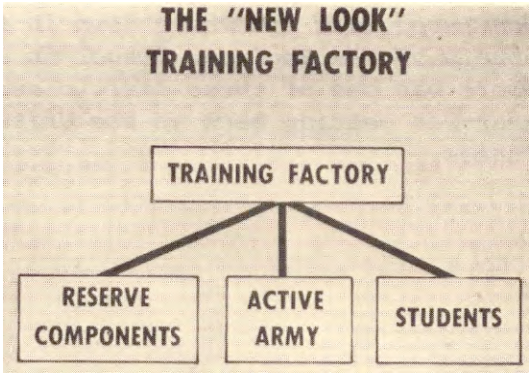
(4) OPERATE THE CYLINDER TO SEE IF THE NEW FEMALE COUPLING ELIMINATES THE TROUBLE. IF IT DOES NOT, INSTALL A NEW MALE COUPLING AND TEST. IF THIS DOES

This is a cost comparison between ITDT and the current TMs. It will be more costly initially to develop better publications, and we are going to have to cope with more bulk in the publications. But there will be an enormous payoff. Parts will cost less, man hours will be fewer, down time will be less, training will be facilitated. These efficiencies will more than pay for the start-up costs.

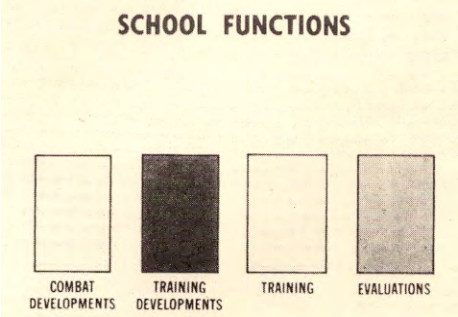
COSTS

	ITDT VS CURRENT
MAINTENANCE	
PARTS	<
MANHOURS	<
DOWN TIME	<
TRAINING	
DEVELOPMENT	>
FACILITIES	<
STAFF	<
STUDENT MANHOURS	<
PUBLICATIONS	
DEVELOPMENT	>
BULK	>

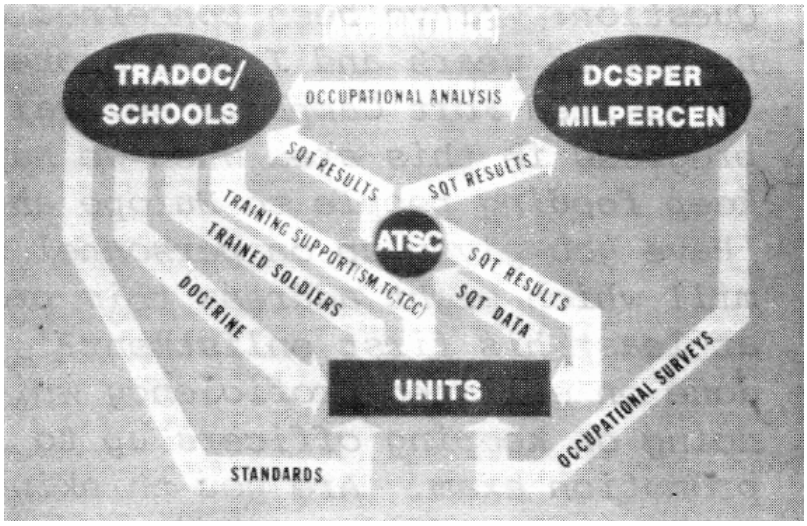
How does TRADOC organize to support readiness Army-wide? The TRADOC has been directed by its commander to turn its schools into what he calls “training factories” furnishing products to three classes of customers. The resident student or trainee is only one of three. Each commandant has been told to develop ways and means of addressing those other customers as well.



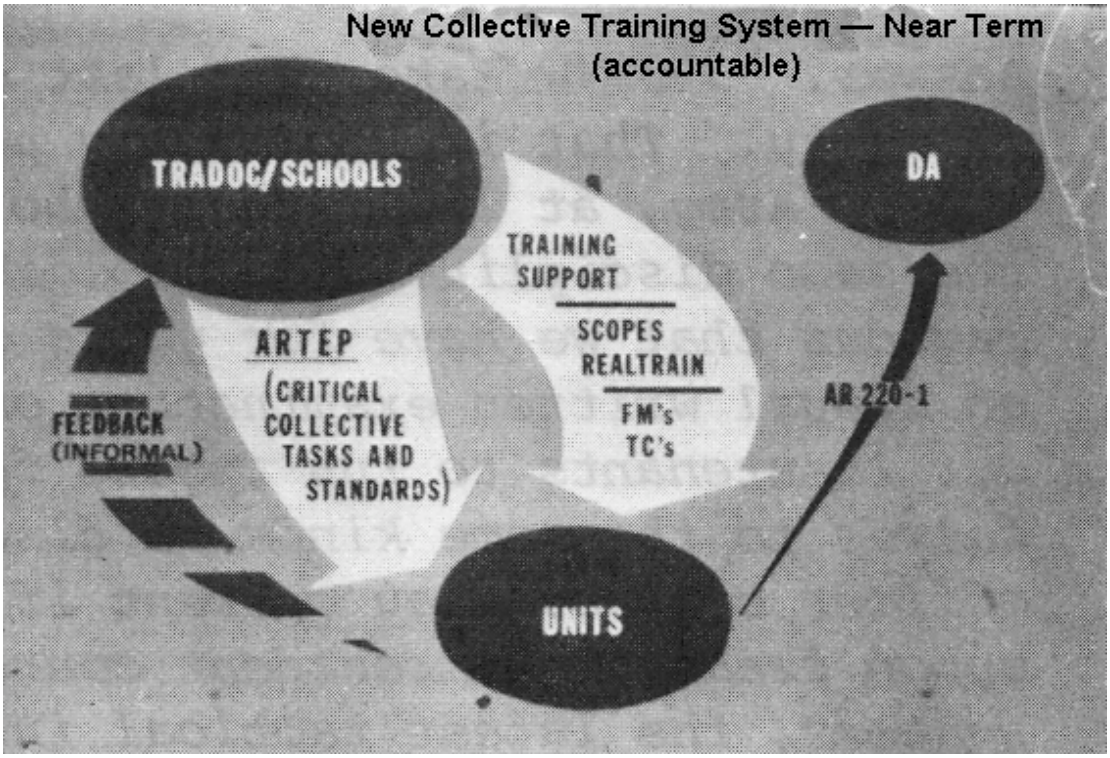
Here are the functions of the schools, as they are presently perceived. Combat Development, Training Development --which we have just been discussing-- the actual conduct of training whether resident or nonresident, and evaluation of how well all of these undertakings are actually working from the customer's point of view in the Active Army of the Reserve Components. You will shortly see in the service schools reorganizations designed to bring the school structure into line with these missions.



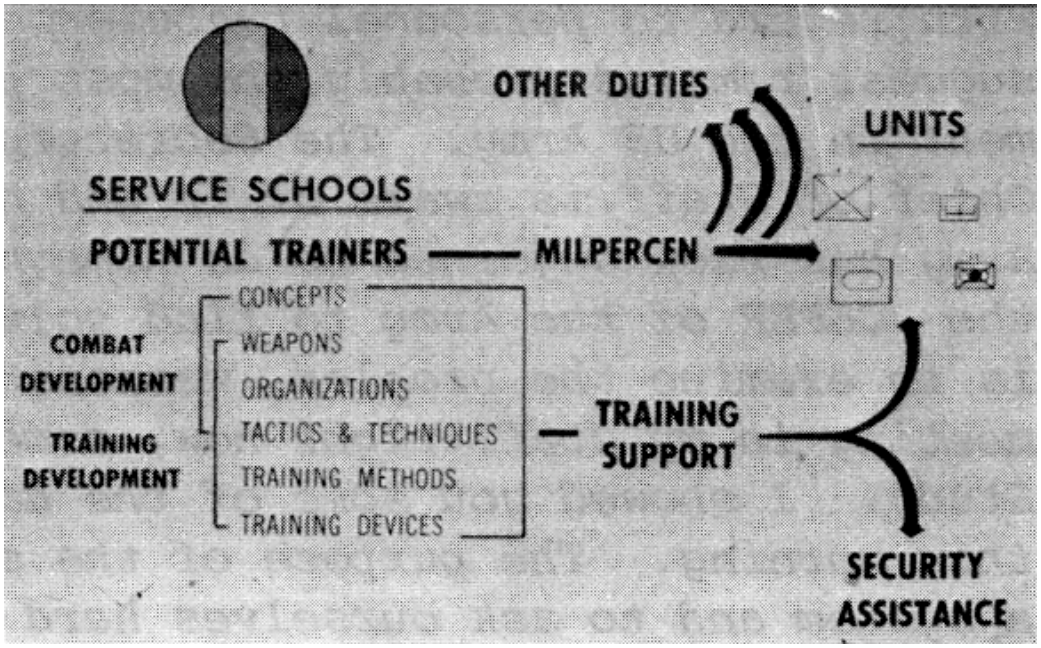
Here is a somewhat complicated diagram, but it attempts to portray an accountable system of Army-wide enlisted personnel management in which key roles will be played by the TRADOC schools, plus a new TRADOC agency to be established this month at Fort Eustis under a BG, called the Army Training Support Center. By next fall, ATSC will be functioning as shown here supporting its new Skill Qualification Tests, and servicing both the commandants of the schools and the MILPERCEN.



Here are comparable relationships within the Army for collective training.



Overall then, TRADOC is evolving into a system for the Army that looks like this.



Sure the traditional mission of maximizing return on time invested for students and trainees persists. But one of the reasons for changes in the TRADOC is simply that the threat and technology move so rapidly that TRADOC must have more ways of updating the force that through producing graduates of resident courses. Graduates are not a very reliable mechanism for keeping the force up to date. Guys who went through the advanced course two years ago are badly out of date today. There's got to be mechanisms for keeping the force clued as to what's going on, hence training development leading into training support. I show you here also the relationship between combat development that Gen Lewis discussed with some of you recently, and training development down below. There gentlemen is the message from TRADOC. What are your questions?

Question: "I've been concerned with personnel turbulence also, for a number of years and I have spoken personally to Gen DePuy about it when he visited Fort Campbell several years ago and I really don't see any progress in this area when we have the 16-month Unit of Choice option and then we keep feeding people to Europe and overseas. So my first question is, 'Have you given up on personnel turbulence or are there actions in the mill which might address this problem to keep a guy, say in a unit, for at least his first enlistment?' Number 2- I see a lot of work being done on enlisted proficiency that is very gratifying. 'What are you doing on keeping officers up to speed?' Years ago we used to have a promotion exam. Are you thinking about instituting something like that to keep the officer corps up to speed?"

Answer: Let me take that last one first. I am considering officer examinations. But I am very much a minority. '1'hat is, my personal conviction is that officers of the U.S. Army, at least those who work with soldiers, should be subject to the same disciplines that soldiers are. I think that it's sort of outrageous that we have for years subjected our noncommissioned officers to an annual written examination on their military proficiency, yet allowed our lieutenants to run around feather-brained without subjecting them to the same kind of discipline. I tell you moreover that an officer can not stay current if he depends upon TRADOC’s schools to spoon feed him in resident courses what he needs to know about doctrine, weapons, threat TTP, etc. There needs to be some kind of incentive system, in my view, to drive him towards keeping himself professionally current. I've been unable to persuade my betters, however, that that point of view is reasonable and should be acted on. I believe, however, that officer exams are bound to come. For a variety of reasons, when you look at the Army long-range, you have to say that in order to keep officers technically current, we are going to have to provide them virtually continuous extension training. And training, if our theory is correct, involves evaluation. So there would have to be some form of evaluation.

With regard to personnel turbulence, as my figures suggest turbulence remains probably the most persistent problem for training management in the U.S. Army. The Secretary of the Army is aware of it. The Chief of Staff is aware of it, and has deplored it. The DCSPER of the Army has been enjoined to do something about it. TRADOC is working with the DCSPER of the Army to find solutions. A present method of attack is to examine the problem weapons system by weapons system. There is, meeting in my staff right now, something we call the Total Tank System Study. I showed you some of the data associated with that study here this morning. The purpose of the study is to look at tanks qua tanks as a system, and to ask ourselves hard questions about how we could change the logistics subsystem, the personnel subsystem, the training subsystem, or some combination of all three, in order to increase the effectiveness of our tanks --the genuine effectiveness of our tanks-- throughout the year. I'm confident that some of the outcomes of that study —which we are obligated to present to Gen DePuy and Gen Weyand by June— will be recommendations on what to do about personnel turbulence. I am, however, pessimistic. Personnel turbulence proceeds from a whole series of independent variables like recruiting, affecting the end strength of the Army, and politically tinged drivers that make it pretty hard for a soldier to prescribe solutions. I think that there is no doubt, however, based on the evidence that I have seen, that there is a very convincing case that personnel turbulence does impact and impact substantially on combat readiness. The current readiness reporting system simply cannot come to grips with it and therefore, it should be changed. But I tell you if you are going back to troops you're going to have to live with turbulence. That's a tough one. A lot of it is self-induced at the troop level. Commanders move their guys around like they are pieces on a checkerboard. Not induced by "the system" but by the predilections of local commanders or by self-induced notions about the career development of soldiers. I talked to a lieutenant platoon leader of a TOW platoon in Germany just last week. I asked him what he had by the way of quality gunners. I said "Do you know how long these guys have been at it" and he told me "a few months." "I asked why when you get a good guy don't you keep him on the gun?" "Sir, TOW gunners are only worth a Sp4; you find a good man you got to get him promoted, so I always move him to a rifle platoon where he can get a shot at promotion." Well there is a perfect example, you see, where you are taking a weapons system, and screwing it in the interests of an individual. You can argue whether that's right or wrong, but I tell you if the Army in Europe is there in part to present well manned TOW systems to the potential enemy. We are not yet doing it right. To sum: we're working on turbulence, but I'm not optimistic.

Question: "There are many of us that I know that are concerned about the fact that it took us about 195 years, I guess, to develop a noncommissioned officer education system, and we are already screwing that up by eliminating a noncommissioned officer basic course. But I guess it's money in the terms of payoff, and all that, and it sounds good, you know, we are going to turn this back to the installations, and the units are going to conduct it and all that, but that's really not practical. I just wonder why we're doing that to something that's probably the greatest thing in the education system of the Army we've ever developed?"

Answer: Well you haven't looked at the same set of figures that I have. We've been running that system for five years now. When it was presented to General Westmoreland in 1971, in a December meeting in the Pentagon, CONARC assured General Westmoreland that within five years 60% of the NCO corps would have been benefited by attendance at one of the NCO education system courses. In the 82d Airborne Division, in divisions in Germany, 10% of the NCO has attended such a course. NCOES, as it has developed, particularly the basic course, has become the privilege of the very few. The many, particularly the many who are out in the units, are not advantaged by that course. That's been the actual track record. As a matter of fact part of the reason for that is precisely because we ran the basic course on a quota system. Division commanders were assigned a quota, had to provide guys to fill the quota, and for years we have been running courses with empty seats. Up until just about a year ago the performance of the basic NCO course at Fort Knox, KY, the Armor school Basic Course, was about 55% fill per class. In other words, we hired instructors, put tanks down there, allocated ammunition, set up facilities in order to conduct a basic course, and the commanders of the Army for good and substantial reasons, i.e., shortage of NCOs, couldn't afford to let the guys that they had on hand go to the course. TDY monies were short, or necessity to keep the sarge there cause the annual IG inspection is coming up, or the NATO maneuver is coming up— you know all of the reasons not sending an NCO away to school. So one thing you can say about the basic NCO course, it hasn't been working to the advantage of 90% of the NCOs who should have gotten it. Now the second thing I can say about that is that don't denigrate the capability of divisional academies or to run a good course, properly provided with materials, properly guided in the conduct of courses. We are persuaded they can do a good job. Some of you may have had experience with the new primary NCO course which being conducted aimed at skill level two soldiers. In my view the feedback from that course has been very favorable. I talked with the CSM of USAREUR about that when I was in USAREUR last week, and he confirms that they are very satisfied with the course that they have put in at the primary level. It is USAREUR's intention to establish the basic course for the combat arms soldiers at Vielsek. And

they will run a centralized program much like the old 7th Army NCO Academy except that the purpose of the basic NCO course is not to teach guys to shine floors or to wear new uniforms, but to use weapons systems and understand tactics and to train soldiers to do same. Concerning the technical MOS career fields, there will be established a primary technical course vice the old basic NCO course. You know the premise that CONARC took into the NCOES in 1971, was that all MOS look alike. And that what you need is a schooling apparatus that says that you have a basic course and an advanced course and then a senior course just like we have for the officers. Now in the officer field we've learned under OPMS that to the contrary, each specialty is different. And guess what? The same sort of representations are true, vis-à-vis enlisted MOS. There are three broad categories of enlisted MOS. There is the combat arms soldier who is inherently difficult to train in peacetime because most of his duties and responsibilities are associated with jobs that you can only perform in wartime. His training is expensive. It involves a simulation of combat of some sort, and you require ranges and other kinds of facilities and training techniques in order to address his problems. He is intrinsically different, from the training strategy point of view, from the service soldier — the medical technician, the clerk, etc., who in peacetime performs as he would in wartime, and your approach to training him, therefore, can be intrinsically different. Those fellows are in turn different from the technician, the man who maintains or repairs equipment. For those soldiers who can work with equipment, training approaches and strategies are possible based on job site emulation. Now you will see us announcing in the very near future an array of primary technical courses, very much longer than the old basic course, for the technician, designed to bring him back into a service school, and boost him to a range of technical competence that we had been able to achieve with the old basic course. The difference between the basic course and the primary technical course is essentially that the course length will be dictated by our analysis of critical tasks, and in most instances it will be longer than the old basic course, and it will come earlier in the man's career. It will pay for itself. Have you heard that 38% of the parts that we are removing from our equipment are in mint condition? Those are actual figures from DARCOM; reason: Skill Level 2 mechanics, the organizational mechanics, the guys who remove those parts, don't know when to do that. They are making very expensive wrong decisions. And the reason they are making wrong decisions is because they have no training, or on-the-job aids to address that training gap. The only training the organizational maintenance guy gets now occurs in AIT in those first blurred weeks in the Army when he is still learning what a drill sergeant is, how to salute, and all those other aspects of socialization. Certainly by the time he gets to be an organizational mechanic, he's long since forgotten much of what TRADOC taught him in AIT. His Motor Sergeant gives him one of old technical manuals like I showed you and says "have at it Charlie." The mechanic unknowingly screws it up 38% of the time; he pulls off parts that should never have been removed, with all of the consequent time delay, readiness setback, and replacement costs, etc. Well we've got to attack that, and we are going to attack that, but you're not going to see the nice neat pattern of basic course, advance course. Every MOS is going to look a little bit different. And we are not going to screw up the NCOES. I insist that a much better Noncommissioned Officer Education System will be the result. As a matter of fact I heard repeatedly in Europe that TRADOC is raping that the technician, you know, that we are paying more attention to the combat arms soldier. Fact is the technician under this plan would get almost 1/3 more TRADOC resident schooling than the combat arms soldier. Now think of it in terms of the divisional commander. Everyone of those divisions for one reason or other is running its own school, because the division commanders want to have a voice in what their noncommissioned officers are taught formally. What we are trying to do is capture that, turn it into some kind of disciplined schooling and give the soldier credit for the schooling that he completes. I think, although it remains to be proven that we are right, but I think that we will end up with the same kind of results that we saw when we implemented the primary noncommissioned officer course for the combat arms. I think that we are going to have very satisfied customers around the Army, or at least that's my guess.

Question: "General, on one of the slides that you had up there it apparently was showing the results of a questionnaire or interviews with USAREUR personnel addressing their problems in training. First and foremost on this particular slide was nonavailability of troops 41%. And you remarked that we were surprised.

Answer: I was surprised at the low figure attached to turbulence. I would have expected the turbulence to be a much more important factor. But the respondents didn't seem to think that this was the case. The big problem in Europe today is the GED program and all of the other mandatory training on drug, alcohol and all of that good stuff which in the perception at least of the subalterns, and the senior NCOS, precludes their getting their guys together to do the kind of training that I was portraying there: work in the field with weapons systems. No, you have got to understand of course that eight months is forever for those fellows. So they may not be as sensitive to this issue of turbulence as they ought to be. But that was what my remark was designed to ..."

Question: " … people were driving the training train. And when you said 41% you said you were surprised. I thought maybe ••• "

Answer: But I wasn't surprised at that. I would have expected that. I thought turbulence would be much higher on the list. But that's about the results I would have expected. Everywhere I went in Europe I asked, "hey, why aren't you getting the mortars out more often?" The reply was usually "I can't get our mortar crews together." Just as a passing comment, one of the things that amazed me in Europe was the frequency with which tankers would· say, "Gee, I wish we could work with the Infantry more often" or vice versa. You see in that little simulation that we are playing, REALTRAIN, that game, there's a high premium on interaction among the combined arms, the elements of the combined arms, and they very quickly learned that they've got a high degree of interdependence. The little action that I watched at Friedberg week ago Thursday was a typical USARETJR day, you know, visibility about 30 meters, fog, cold etc. Well, no matter how good your TOW or your tanks may be, all of that probability of hit at long range vanishes because your opponent they can sneak up on you. And it was the Infantry that dominates the battlefield on a day like that, and those tankers had learned that. The common remark was "'boy, we should have learned this a long time ago." That's right on. I'd think you would agree.

Question: "Sir, in keeping with the REALTRAIN concept, would you just touch on the development that we may or may not have made with the laser rifles?"

Answer: The Multiple Integrated Laser Engagement System. I skipped rapidly through those slides, but obviously a laser, which is a highly directional beam of coherent light, can emit a microsecond burst, and used to stand for or to replicate a projectile going down range. Now it doesn't behave exactly like a projectile in that it goes in a straight line, but it enables a reasonable enough approximation of direct fire. It's very easy to build such a laser. In fact you can do it with parts that you can buy out of the catalog --Edmonds Scientific Company for example-- you can build your own rifle laser for about $50. I've got a chap over at Fort Eustis, in fact, who builds them in his garage. All you need to do is to align it with a cheap lens. and some very modest electric circuitry, and you got your self something the size of a deck of playing cards, $50 worth, very light, with a nine volt battery. But it can be used to represent a bullet going down range. Now we've carried all of this to the point that at Fort Jackson, SC, we now have up and operating, a moving target range for training riflemen. Sort of going to the solution that CDEC-identified training gap that I was discussing with you earlier. Kids in foxholes equipped with these lasers have to engage targets that move on trolley cars. Squad in the defense kind of a problem, a training exercise that would be difficult to handle if you were using live ammunition because of the overlapping bands of fire and the safety problems thereby engendered. At Fort McClellan, in WAC training, we have a standard TRAINFIRE range up and operating using the laser rifle. At Fort Dix, NJ, at the Reserve Component Training Center, we have up and operating a moving target range where the lasers are shooting at target images in a movie. These are all experimental programs. We are attempting to validate the training effectiveness of the laser. We have in our tests thus far, established that there is no substantial degree of difference in marksmanship performance from shooting lasers on a standard TRAINFIRE range, firing at stationary popup targets in lane. We have found no substantial degree of difference in accuracy, probability of hit, between soldiers trained with live ammunition and soldiers trained with the laser. Beyond that, at this point in time we can only say that the technology is under test. But we're convinced enough of the concept to have underway with DARCOM, a fairly substantial developmental program. I would expect within two years to see a pretty substantial proliferation of all of those sorts of systems for the Army. It certainly is a way of attacking the moving target business very realistically. And of course coming down the road, 78-79, will be the MILES System, which is laser based, and in effect a family of lasers that will permit full simulation of all of the direct fires weapons in the combined arms. That's been through OT I. that has established that the system works. We are in engineering development right now, with Xerox Corporation.