LETTERS

Complexities of WWII Armor

Dear Sir:

The January-February 1995 issue of *ARMOR* with Mr. Halbert's review of my book, *Standard Guide to U.S. World War II Tanks and Artillery,* just reached the top of my reading pile. I appreciate the review and its kind words.

I also appreciate Mr. Halbert's "only real criticism" of the book. Since his review appeared in an important professional journal, I think it warrants an explanation of why I did not include either tank armor thickness data or armor-piercing ammunition, or any other terminal ballistics characteristics.

Let me preface my remarks by stating that I served in World War II and in the U.S. Army Ordnance Department. I also graduated from the U.S. Army Ordnance School at Aberdeen Proving Ground.

Regarding tank armor thickness: The widely used World War II U.S. Army technical manual TM 9-2800, *Standard Motor Vehicles,* did not include this information. It is found in the technical manuals for every model and variation of tank with a listing of eight armor thicknesses for the hull and turret. In special Ordnance Department publications, additional variations in armor thicknesses are mentioned as having been the result of changes made in production without effecting parts and assembly interchangability. Modification Work Orders that were followed in the overhaul and upgrading of tanks mention further changes in armor resulting from such things as welded-on applique armor.

In the case of the some 55,000 M4 Shermans built during World War II, for example, a very complicated page or so of armor thickness statistics would be required to state all those required, and I felt this would add little to the understanding of U.S. Army World War II tanks in the concise review of the subject I present. I did consider using the World War II British "armor basis" system of doing it, but since the U.S. Army of World War II neither liked or used it, I chose not to.

In regard to U.S. World War II armor-piercing ammunition terminal ballistics, the situation is equally complex. There were several basic types of armor-piercing ammunition used, including AP armor-piercing shot, APC armor-piercing capped shot and HVAP high velocity armor-piercing shot, and each of these had it own special armor-piercing characteristics. Over the course of World War II, changes in both armor-piercing projectiles and the propelling charges were made which affected the armor penetration, creating additional statistics.

During World War II, the U.S. Army Ordnance Department Technical Intelligence people reported that, in any case, the armor penetration data presented was unreliable. The problem was that enemy tanks' armor varied considerably in the type of steel used, the way it was processed, and in quality, all of which affected the effect of armor-piercing projectiles on it. A large amount of complex and confusing data would have been required to explain this and I chose not to include it since I felt it would add little to my basic objective of presenting the subject in a simple and concise way.

My basic objective in writing the book was to present a complete and concise review of the materiel the U.S. Armed Forces used in World War II, because this had never been done. There have been, for example, books published on specific U.S. Army World War II tanks, such as the M4 Sherman, which include information on both the armor and main gun armor-penetration characteristics, and these show just how complex these characteristics were.

I hope you understand this explanation, and that you and other readers will find the book useful as the concise overall review of its subject it is intended to be.

KONRAD F. SCHREIER JR.
Los Angeles, Calif.

Pitfalls of Armor Comparisons

Dear Sir:

In regard to the book review of *Standard Guide to U.S. World War II Tanks and Artillery,* p. 52. I partially agree with the reviewer's comment that the book would have been enhanced by including armor thickness and penetration data, but there are pitfalls in doing that. The only really meaningful comparison of terminal ballistic data is of data gathered under a closely controlled series of tests run by a competent, unbiased test organization. To compare one set of ballistic data from a source of undetermined accuracy and credibility, insufficient detailed information about the ammo and the armor quality (often **wartime** ammo and armor), unknown standards for 'success' of either the ammo or the armor, uncertain date, and usually unknown weather conditions, with another set of ballistic data with equally vague test conditions, often from another country, is to truly 'compare apples and oranges.'

Another point often lost in comparing such data is that to **defeat the armor** (put a hole in it) is not the same thing as **defeating the system** ('knocking out' the system, or better, destroying it.)

Nonetheless, authors will often struggle to include such data. Some will do a reasonably good job, and others will not. My concern is that the readers will fail to understand just how little faith one can put in such comparisons unless one is comparing systems of grossly unequal capability.

For those with interest in more detail about the U.S. 76mm HVAP performance against Panther and Tiger tanks, as well as a great deal more about U.S. tank and tank destroyer weapons in WWII, I strongly recommend *Faint Praise: American Tanks and Tank Destroyers in World War II,* Charles M. Baily (Yes, there is no 'e' in this Baily!), Archon Books, Shoe String Press, Inc., Hamden, Conn. Excellent, compact, and inexpensive.

DONALD J. LOUGHLIN
Antioch, Calif.

The Cav Gunner's Full Plate

Dear Sir:

It is a well known fact that, as a master gunner, the learning does not stop once you leave the classroom. This is especially true for a cavalry scout (19D) master gunner. The position of a cavalry troop master gunner is considered an extra duty; they must still fulfill the duties of section sergeants and platoon sergeants. This makes time management critical and, if not managed properly, will greatly affect a gunnery program.

Another consideration is the fact that a single cavalry troop usually consists of 13 Bradley Fighting Vehicles, nine Abrams tanks, two mortar carriers, and several other assets. On top of this, the squadron that this troop is part of may have as many as three troops of attack helicopters under its colors as well. This brings a whole new perspective to the cavalry master gunner. As the troop Bradley master gunner, I feel it is my responsibility to ensure killing success for my troop's Bradleys on the battlefield. To achieve success on the battlefield, the cavalry truly uses the combined arms concept, combining fires on their targets, thus causing a swift, violent conclusion to any engagement, allowing minimal friendly loss and minimum time, if any, for the enemy to report their contact to their higher, as well as other reasons. Because of the way the cavalry coordinates fires from all of its fighting assets simultaneously on the battlefield to achieve total victory, I must now better understand the characteristics and capabilities of all the assets my troop utilizes on the battlefield. This brings yet another great challenge to both the tank and the Bradley master gunners in both gaining the needed knowledge and coordination of these assets to train and work as a cohesive team.

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An example of this is when my troop conducted BCPC. As the troop Bradley master gunner, my intent was to use an actual range to better familiarize the new Bradley crews.

This also was the thinking of the tank master gunner and, because of limited range time, both tanks and Bradleys conducted TCPC/BCPC simultaneously. By running tanks down one lane, and simultaneously running Bradley's down another, we were able to maximize our range time and further build cohesion between the two elements.

I feel the success of this BCPC/TCPC was due to the tank and Bradley master gunner's willingness to become familiar with each other's equipment and gunnery standards, allowing both to take turns running the range.

As a 19D firing table X, you are evaluated on your ability to call for and adjust fire, yet on the battlefield you will also have to talk helicopters and tanks onto targets, mark targets with direct and indirect fire, and/or assist in massing fires on them. Should the master gunner be the technical and tactical expert in such a combined arms engagement? By all means, yes; thus the importance of his coordination skills, teamwork with his fellow tank master gunners, and the absolute must of understanding all the equipment on the battlefield.

This is quite a load to bear as a soldier in the cavalry; this is the reason only the best are selected and pass the challenge of the Master Gunner School.

The combined arms concept has already proven successful against a numerically superior force, and the technology of today's Army makes us the superior on any battlefield. It is up to us to make it work.

RECON OUT FRONT!

SSG FRANK R. BELONUS
Troop Master Gunner
B/1-4 Cavalry
Ft. Riley, Kan.

Change Course Prerequisites

Dear Sir:

Recently, I had the misfortune to attend the Senior Instructor Operator Course at the Armor School. I did not graduate because, although I tried, my 19E skills were not enough and no match for the M1 advanced matrix. Upon arrival at the course, I was informed that, although there is no mention of the fact that the Armor School does accept A1 screen applications from ARNG personnel and screens them, no M60A3 Senior Instructor Operator course exists, even though there are still M60A3TTS tanks in the system, and some units are not scheduled to transition until 1997.

I spent considerable time getting recertified during my Christmas leave, not to mention that I invested my own funds to attend the course. I was informed that since I was there, I would be allowed to take the entrance examination; however, there was no mention of any required train-up on the M1A1 Turret system. I passed the entrance exam and went into the course to begin training, and foreseeing a problem, requested and got extra training during the evening. The reason I am writing this letter is that even though I requested extra training, I sensed the attitude of the course manager and those civilian instructors was that because I was an M60A3 (19E) tanker, I was going to hold up the other students.

I would recommend that Fort Knox changes the course prerequisites to include only those ARNG personnel who are NETT-qualified and either drop 19E personnel from the course listing or ensure that M1A1 experience is required in order to take this course.

I wasted considerable training time at Ft. Knox and approximately $650 out of my own pocket (per diem is not paid for this course), not to mention wasted time away from my AGR position, which at tank company level never gets replacement or augmentation. Funds are short, so we cannot pay someone while the ARNG full-time unit support personnel are not there. If I had known that M1A1 and advanced matrix experience was a requirement, I would have made an effort to train on these subjects.

It would be very helpful to make those suggested changes to the course so that someone else does not make the mistake and/or waste precious training funds or resources and training time in a situation like this.

SFC LEONARD W. FORMOSEA
Unit Readiness NCO
B/149 AR

Autoloaders — Thanks, But No Thanks

Dear Sir:

In the article submitted by Western Design Corporation, "Ammunition Loading Systems for Future Tanks," much thought is given to clever autoloader designs, but not much thought to the realities of life on a tank. Sharoni and Bacon contend that "any rational design approach for a future main battle tank will commence with the selection of the armament system, to include the main gun and the ALS." Shouldn't it really commence with an understanding of what tankers need to fight and win? I will not bore the reader with the list of duties performed by a loader that cannot be performed by a piece of machinery. Suffice it to say that a tank crew is a team and every man is essential to the success of the mission. Automation of the main gun will not reduce the "workload" of a tank crew or platoon. What an autoloader will do is take up precious space, require maintenance, and almost certainly reduce the number of troops available to accomplish the mission.

Sharoni and Bacon state that "the three-versus-four-man-crew is a doctrinal issue and should not be driven by engineering considerations." Having said that, they move right on to bend doctrine to fit an autoloader design. Here are some doctrinal issues from a line unit.

1. Keep it simple.

2. Tank crews cannot afford to be any smaller; there's too much soldiering to be done.

3. Tank designs that sport unmanned turrets are a no-go. The tanker's greatest asset is his commanding first-person view of the battlefield. The crew needs to be up in the turret, oriented with the weapons. Fighting a tank from the hull like a mole may increase survivability, but strips the crew of its natural situation awareness and ability to fight the tank.

WDC decrees that "automatic loading systems will become standard... Crew member duties will be readjusted to address other battlefield management technological needs." Wow, sounds great. Perhaps they can explain how to "readjust" the tasks required to prepare a defensive position. I'll be all for an autoloader when it can emplace the M8 chemical alarms.

Incorporating an autoloader would be great for companies like Western Design, but it wouldn't do companies like Charlie, 3d Tank any good. Let's spend the money on something useful, like the long-overdue Under Armor Auxiliary Power Unit (read: a decent generator for silent watch), or a MK-19 for the loader to use. Autoloaders are wonders of engineering, but I say: thanks, but NO THANKS.

TODD R. BRANNON
1LT, Armor
C/3-112 Armor, TXARNG

Improving Leadership Training

Dear Sir:

"To command is to serve, nothing more, nothing less." — Andre Malreaux

I concur with much of the argument made by CPT Kenneth H. Webb in his March-April letter "The Combat Arms Leader." In this time of rapid technological change, specialization is maladaptive. The pace of change is increasing at such a rate that to-

day's specialists will, in all likelihood, become the obsolete and out of touch work force of tomorrow. I agree that it is becoming increasingly important for our officers to learn how to synchronize battlefield operating systems at the company grade level; in the division cavalry, our lieutenants are frequently placed in a position where they must coordinate the direct and indirect fires and army aviation assets organic to our squadrons. It simply is not necessary, nor is it desirable, for every officer to become an expert in each of the weapons systems and CSS systems at his disposal in order to be an effective commander. Our Warrant Officer and Noncommissioned Officer Corps are more than capable of providing us with the expert guidance and technical support we need to get any job done.

As we grow smaller, we must grow better. How we grow better is what we seem to be struggling with now. I stoutly disagree with the proposition put forth by MAJ Morrison, September-October 1994 "Armor Officer 2000," that our "second-stringers" be farmed out to ROTC command and CSS jobs. If training is the most important job we have in peacetime, then training our future leaders should be a task reserved for our finest, not second-best. No branch of our Army can afford to tolerate captains or colonels who are not fully qualified to compete with others for command of any unit, tactical or otherwise. Our present system of schools certainly can be improved, but not by staffing them with the outcasts of our mainstream professional culture. MAJ Morrison is right on target, however, in his assessment of CAS^3. By the time most of us get there, we've already done the jobs it prepares us for, and under much more stressful conditions. The basics are already covered in our Advanced Course. Perhaps what we need is a post command, preutilization tour of a week or so, or AAR and brainstorming session to capture some of what we've learned at the company level for future generations.

I also disagree with the "credentialing" path that MAJ Morrison lays out. Airborne, Ranger, and Air Assault Schools have their place, to be sure, but they do not necessarily provide us with better leaders. Leaders provide us with better leaders. Officers that make the time to spend with their junior leaders and teach them, mentor them, or just plain kick 'em in the butt and get them moving in the right direction are our most reliable source of leader development and leader selection. If we are going to require our officers to graduate from some sort of leadership school, let's make one of our own at the Armor School. Let's make it part of the Basic Course and give everyone a chance to attend. In fact, throw in our junior NCO leadership as well, and make this a follow-on for PLDC or BNCOC and really round out the student population. Let's make it as tough as Ranger School so we don't feel like second-class citizens when we hang out with infantry guys, but make it into something armor officers can really benefit from. The Scout Platoon Leader Course is a great beginning and meets the standard of toughness we need. Doing 19D and 19K tasks for five or six weeks non-stop in the woods around Ft. Knox, with a week or so in the desert at Ft. Irwin, would be great stuff and immediately relevant to our branch. It would provide us with leadership training that is grounded in armor/cavalry tactical doctrine. Let's even award a badge or tab to top it off!

So much is changing, and so fast. If we are going to change our professional development or career management system, let's do it with a clear head and clear objectives. It's easy to become fascinated with all the new technology we have at our disposal, but let's learn how to use it effectively and see what it can and can't do for us before we leap to any conclusions regarding its effect on our future. Good examples of how not to implement new technologies abound in business, sociological, anthropological, and historical literature. We need to get better at learning from these examples and looking at how we use emerging technologies to our maximum advantage. Let's not become so enthralled with technology that we forget what it is we are about, and what it is that we want to become.

Finally, when it comes to deciding who is best qualified to lead or command, the best tool we have at our disposal is the officer evaluation system. It may require some tweaking, but the basic framework is in place. I believe that the best measure of the man is and will remain an involved and dedicated senior officer; an officer who is involved in the development of his subordinates and dedicated to the future robustness of his officer corps. No amount of schooling can accomplish what mentorship or apprenticeship does in our training. And, since people are our business, let us not lose sight of the fact what we need to invest adequate resources in their training and constantly look for ways to improve it. Our system of schools deserves funding that is competitive with that reserved for R&D and new equipment fielding. After all, good equipment in the hands of a poorly trained and led force does not provide us with the kind of warfighting capability our nation demands.

CHARLES H. BENSON III
CPT, AR
Ft. Hood, Texas

Tank Crew Proficiency Course (TCPC) without MILES

Dear Sir:

Over the past 17 years that I have been assigned to MTOE units, I have seen a lot of changes in the way we train. One of the biggest changes was the use of MILES, LTIDS, and scaled-down targets. I tend to question the gain we realize from conducting Tank Tables III and IV with these training devices. Are they truly training multipliers?

First, we must look at the objectives of Tank Tables III and IV:

1. Proper gunner techniques, i.e., always aiming center mass.

2. Switchology.

3. Target acquisition.

4. Fire commands and subsequent fire commands.

5. Crew drill, with a **four-man crew.**

Let's take a few minutes and examine the following — the use of the above-mentioned training devices versus the use of alternative method. With MILES, we are able to allow the crew to see the results of their efforts. The crew gets to make targets fall down. This is great...or is it? I've talked to a lot of crews and, with their assistance, I have come to these conclusions.

1. Crews tend to aim all over the target when the target fails to fall. They do this by applying BOT (Burst on Target) methods until they get the desired results — the target falling down. Why would they do this?

a. LASER Safe Filter not installed.

b. No reflective devices on the targets to get a return back. This produces gunners that fail to verify their range because no range gets displayed through his GPS.

c. Commanders are more concerned with seeing targets falling, and forget about the primary purpose of lower tank tables, crew coordination.

2. Loaders are not very involved with the conduct of TCPC when MILES is used. He may arm the arming lever, may open the ammunition door, or may not even be present at all.

3. Valuable training time is lost every time we have to stop and fix the broken or inoperative MILES, LTIDS, or replace weak batteries.

4. Crews rarely practice malfunctions with great efficiency with MILES, i.e., stuck Aft caps, breach up, or even misfire procedures.

5. Now, after looking at all the above, we can say the following:

a. Without the loader, we loose 25 percent of our training value off the top. He is an intricate part of the crew. He is highly involved with the correction of malfunctions. His loading abilities play an intricate part in crew coordination.

b. We lose the ability to train our tank crew evaluators in the art of timing and conduct of a course which, if trained, could play in how well a unit can prepare for Tank Table VIII.

c. Gunners can pick up bad habits by aiming all over the target trying to hit the sensor.

Remember, the above are comments gathered by talking to tank crews and are not my own opinions.

Now, let's look at the alternative way. Get rid of the MILES, and LTIDS. Then incorporate the use of the simple training device, the 120-mm Rubber Training Round. By use of the round, you are finally able to integrate your loader as a fully participating member of the crew. He will finally learn his place in the crew prior to going to a live-fire facility.

Here are ways that you can incorporate the alternate training method and the loader and make major progress in preparing your crews for live fire.

1. Have each crew arm the gun, lower the breach while the Aft Cap Deflector remains in the raised position. The loader must now place the gun in the safe position, choose the proper round (SABOT or HEAT), load the gun and announce "up" or "HEAT loaded" which in turn allows the tank commander to actually wait for the second round to be loaded before announcing "Fire."

2. TC takes an Aft cap, places it in the main gun. During the engagement, the loader announces "Stuck Aft cap" and then the crew goes through the emergency procedures.

3. TC places an Aft Cap in the main gun and raises the breach to the fully closed position. During the engagement, he or the loader announces "Breach up." They then go through the proper procedures.

4. Loader loads the second round for each engagement, allowing him to use the "EL Uncoupled" in the defense and on the move. This is not only valuable to his training, but also to the rest of the crew, ensuring they are used to the motion of the gun locking at 0 degrees and then returning to the target when the gun is placed in the armed position.

5. This allows the crew to go through the proper misfire procedures with the use of a main gun round.

6. The entire tower crew, from the timers to the person listening to the jump, gains valuable experience in proper timing and scoring techniques of malfunctions to perfect engagements.

I can only say that unlimited training opportunities are gained by training the alternate method. I understand there will be considerable arguments about not using the MILES and LTIDS. So, try and think of it in an unbiased way. You can use the MILES and LTIDS and only train tank commanders and gunners or you can train a full-up crew. Remember, the lower tables are to train a full tank crew in crew coordination and then test their abilities. Tank Tables V through VIII train and test the crew's ability to hit and destroy targets with all tank-mounted weapon systems.

SFC BOBBY D. JONES
Master Gunner/Platoon Sergeant
A/2-64 Armor

Assault Gun Battalion 96 — The Author Replies

Dear Sir:

I read the responses to my article, "Assault Gun Battalion 96," with some interest. I appreciate MAJ O.T. Edwards' efforts to correct some of my more fallacious assumptions, which were based on information gaps (and I applaud the inclusion of the infantry phone in the design). I am concerned that the same Level Three armor that makes the vehicle more protected against RPGs and the like will also make it harder to deploy by air. This, however, is a METT-T trade-off and what we as leaders get the big bucks for.

However, I am afraid that CPT Michael Stollenwerk missed the point. The doctrinal focus of the Assault Gun Battalion is not WWI, as he claims, but Vietnam. That is to say armored forces employment in Low Intensity Conflict (LIC), which is where the light divisions, by design, spend most of their time. CPT Stollenwerk's points about exploiting the mass, speed, firepower, and shock effect of armor are well taken. In my four years as a company and battalion S3 observer controller at the NTC, I developed a fine appreciation for these principles. However, we would do well to bear in mind that not every conflict we will encounter is DESERT STORM. Armor also has a role in LIC as Vietnam, Grenada, Lebanon, Panama, and Somalia have shown us. Although there was some massed use of armor in Vietnam (mass being a couple of squadrons of an ACR), for the most part armor involvement in these conflicts involved company-sized units or smaller attached out to infantry forces or providing specific functions like convoy security. I recommend highly SGT Ralph Zumbro's book, *Tank Sergeant.* When you read past the "hoo-ah, I was there" war story tone of this book, you will find all sorts of useful nuggets for armor operations in LIC environment. Training to do well in this environment means that we will have to do things differently, like cross-attach armor companies and platoons, conduct gunnery in conjunction with dismounted infantry, and learn to move slowly in conjunction with foot troops.

CPT Stollenwerk also makes the rather bizarre point that a cross-attached AGS could be utilized by the infantry for moving water and ammunition across the battlefield. The implication in his statement is that this would be a misuse. While as an infantry leader I would not normally think of using an AGS (or a tank) in this manner, one can never say never. I seem to recall reading in *ARMOR* a few years ago about one of the great tank actions of WWII, where a German Panther tank in Vienna towed a trailer across a bridge under fire and carried ammunition and food inside for infantry troops defending on the far side. The tank then went on to destroy multiple Russian tanks and break up several attacks, ably assisted by the infantry it had resupplied. Our own Army's history in Vietnam is replete with stories of tanks being used to rescue troops pinned down under fire, by pulling them through the bottom escape hatch. I would not lightly take the firepower of the AGS from its primary duty of direct fire support of the infantry, but I would not hesitate to do so to rescue some troop pinned down where we couldn't get to him, or get ammunition across an open space that was covered by small arms fire (if no other vehicle, like an M113 or BIFV, were handy). I am sure CPT Stollenwerk's experienced Armor NCOs would not balk at this.

In summary, the Assault Gun Battalion would have to be prepared to operate across the full spectrum of conflict. The battalion could perform some missions as a battalion in a higher intensity scenario. Indeed it could be the only element of a light division to deploy to combat, as I pointed out in my article. However, much of its time would be spent in the messy (and more frequent) world of LIC employment. We cannot become tactically blinkered into only one way of doing business. Armor officers must be prepared to support the dull grind of LIC as well as be the Combat Arm of Decision.

MARTIN N. STANTON
LTC, IN
Brandon, Fla.

The "Gavin" Armored Gun System

Dear Sir:

I propose that the new Armored Gun System (AGS) be named in honor of the WWII commander of the 82d Airborne Division, MG James Gavin.

Naming the AGS for General Gavin would be a tribute to his leadership and devotion to the Army. The "Gavin" would be a fitting legacy to his honor and memory. What better way than to name this vehicle which will be deployed with his division?

SFC CRAIG C. MOSHER
Ft. Knox, Ky.

2d Tank Battalion, 9th AD To Hold Reunion in September

The 2d Tank Battalion, 9th Armored Division will hold its annual reunion September 7-10, 1995, in Memphis, Tenn.

For more information, contact Elvin Littlejohn, 3428 Dupree, Memphis, TN 38115, phone (901) 362-2116; or Ruth Ganser, 713 5th St., Mosinee, WI 54455, phone (715) 693-3104.