

# ARMOR



**Armor in the Spanish Civil War** *See Page 30*



**“Saddle up . . . Tonight we ride!”** Years ago, as a young captain, I drilled my two- and three-year-old daughters until they responded in unison with the refrain “tonight we ride,” when prompted with “Saddle up!” The ritual was cute; the girls enjoyed themselves. Today at the advanced ages of seven and eight, the girls find the ritual demeaning and seldom indulge Dad. Fortunately, I have another daughter and candidate for the ritual, so as she closed on her second birthday, I shifted my efforts. She grasped the concept quickly and responded appropriately with “Tonight we ride.” But the ritual took a strange turn when she suddenly paused, fixed me with her big green eyes, and asked, “Where we ridin’ to?” Damn, that’s a good question, I thought.

“Where are we riding to?” Cold warriors in Europe answered a bugle call which took the form of an early-morning phone call and the words “Lariat Advance.” They patrolled a border that no longer exists and moved to defensive positions long-since forgotten. Today, tankers and cavalymen in Europe patrol countries and republics that until recently did not exist, and a tank battalion from Germany will deploy to Kuwait this spring for Intrinsic Action. Had anyone speculated then that tank or cavalry units might inspect weapon storage sites in a country called Bosnia, patrol in the Former Republic of Macedonia, or deploy to southwest Asia, he would have been thrown out of the vault where the trusty battle books were stored.

Where are we riding to, or better yet, what will we cross the LD in, and how will we fight meeting en-

agements in the next century? Things change; there are few constants in life. One constant for 111 years has been *ARMOR* Magazine, which began life as the *Journal of the U.S. Cavalry Association* in 1888. For over a century, the magazine has served our profession as a crucial forum for professional discussion, surviving name changes, 38 editors, budget cuts, and a relocation to continue as the premier journal for discussions of mounted maneuver warfare. *ARMOR* Magazine will carry the discussion into the next century. “Where are we riding to?” I don’t have a definitive answer, but I’m willing to wager that answers will be postulated and debated in that constant — *ARMOR* Magazine.

Answers will take the form of letters, suggestions, dialogue, and material from the field which sustain this journal. *ARMOR* Magazine depends upon its readers. Take a quick glance, if you haven’t already, at our masthead. The magazine runs lean; it’s a small competent team that publishes *ARMOR*, so I ask you to participate in the dialogue and exchange of ideas, and to those who have done so in the past, my thanks.


It’s my privilege to take up the reins as editor-in-chief. Like the editor before me, I pledge to dedicate my efforts and those of the staff to continue the journal’s focus on warfighting.

My thanks to LTC Terry Blakely, who quite simply has done a splendid job and leaves a universally respected magazine in his wake. To Terry and his family we bid in Navy-speak, “Fair winds and following seas.” — D2

By Order of the Secretary of the Army:

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# ARMOR

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March-April 1999, Vol. CVIII No. 2

## Features

- 8 **Controlling Armor's Destiny**  
by Brigadier General John Kirk (Retired)
  - 16 **Life After Operational Maneuver (a 12-step program)**  
by Cadet Joseph Berg and Captain Robert Bateman
  - 20 **Tips for Tankers or Lessons Learned and Re-learned**  
by Colonel Christopher V. Cardine (Retired)
  - 24 **TEAM RECON: A New Approach to Armored TF Reconnaissance**  
by Lieutenant Colonel Henry M. St-Pierre and First Lieutenant Jamie E. Warder
  - 27 **Will the New Brigade Reconnaissance Troop Be Adequately Protected?**  
by First Lieutenant Wayne T. Westgaard
  - 30 **The Theory and Practice of Armored Warfare in Spain  
October 1936-February 1937**  
by Dr. John L. S. Daley
  - 31 **Soviet Armor in Spain:  
Aid Mission to Republicans Tested Doctrine and Equipment**  
by Colonel Antonio J. Candil, Spanish Army
  - 44 **Weapon Storage Site Inspections**  
by First Lieutenant Justin W. Verhey
  - 47 **How the Guard Could Cut Costs on Table VIII Without Really Trying**  
by Dr. Joseph D. Hagman and Dr. Monte D. Smith
  - 50 **The ACAV Lives...in Bosnia**  
by Sergeant First Class Gregory T. Dean (Retired)
  - 51 **Half Full....Or Half Empty**
  - 52 **Tactical Vignette 99-2: "The Passage at Wilcox"**
  - 53 **Solutions to Tactical Vignette 98-6,  
"Cobra's Counterreconnaissance Fight"**
  - 61 **1999 Armor Conference — "ARMOR: Spearhead to the Future"**
- Back Cover** 1999 Armor Conference Tentative Agenda

## Departments

- 2 **Contacts**
- 3 **Letters**
- 5 **Commander's Hatch**
- 7 **Driver's Seat**
- 55 **Reviews**

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## Safety Interlock Developed For the M1A1 Driver's Hatch

Dear Sir:

PM Abrams has designed and approved a system to prevent the turret from turning when the driver's hatch is opened. This modification will prevent many of the accidents that we have seen in the past. It has been applied to all M1A2 tanks, and we are beginning to apply it to M1A1 tanks. Training for this modification on the M1A1 is being done by an interactive CD produced by the TACOM New Equipment Training Group. M1A2 Training is done by a TV tape which was distributed to each unit with M1A2 tanks, along with a lesson plan.

Each M1A1 armor battalion commander and cavalry squadron commander will be mailed a copy of the interactive CD to train crews on how to use the Driver's Hatch Interlock. More copies can be ordered by contacting USA-TACOM, ATTN: SFAE-GCSS-W-AB-LF (Mr. Tom Werth), Warren, MI 48397-5000 or email wertht@tacom.army.mil.

Copies will also be sent to the Army National Guard distance learning library, TRADOC distance learning library, Ft. Knox Master Gunner School and Ft. Knox DTDD.

Installation of this modification will result in crew protection while still allowing for an override in the event of an emergency.

TOM WERTH  
Abrams Net Mgr  
DSN 786-8201

## Army National Guard Has Light Cav Troops, Too

Dear Sir:

Although *ARMOR* magazine is generally supportive of the Total Army concept, I wanted to point out several omissions in the November-December 1998 issue. In the article, "Airborne Ground Cavalry," CPT Stephens writes that, "there are only three other [than the 82nd Airborne's A1-17th CAV] separate light cavalry troops in the United States Army, not including those troops which are part of the 2nd Armored Cavalry Regiment at Fort Polk, Louisiana. These troops are located at Fort Wainwright, Alaska; Fort Drum, New York; and Schofield Barracks, Hawaii." Obviously, CPT Stephens does not consider the Army National Guard's six light cavalry troops (one from the 29th Infantry Division and five from enhanced readiness brigades) to be part of the U.S. Army. In fact, if the 2nd ACR's troops are excluded, the Army National Guard has 6 of 10 light cavalry troops in the total force structure. By allowing such ignorant comments to be included in your magazine, *ARMOR* only helps to perpetuate parochial attitudes.

An even more common example of ignoring the Army National Guard's contributions to the total force was found in LTC Stanton's article, "An NTC For the Next Century," when the author refers to the "10-division (and shrink-

ing) over-committed Army..." Funny, when I checked the 1998-1999 *GREEN BOOK*, the U.S. Army had 18 MTOE divisions (10 active/8 Guard). This reference to a "10-division army" is often repeated in your magazine and other professional journals. Nothing irks Guardsmen more than to be treated like "unpersons" in units that don't exist according to some narrow-minded bigots. I'm sure *ARMOR* would not tolerate derogatory racial or ethnic statements in its articles, but I fail to see why it permits recurrent pernicious slights of fellow soldiers in its pages. This only contributes to undermining the Total Army.

ROBERT A. FORCZYK  
MAJ, MI, MD-ARNG  
G-2 (Ops)  
29th Infantry Division (Light)

*(To quote from Jimmy Buffett: "Mea culpa, mea culpa, mea maxima culpa..." I believe ARMOR's record speaks for itself in regard to its coverage and treatment of both the National Guard and Reserve, but we can always do better. - Ed.)*

## Seeking Alternatives to "Scouting in a Winnebago"

Dear Sir:

Skimming through the Jan-Feb edition of *ARMOR*, I noted a letter by COL (Ret.) Chris Cardine on scout vehicles, and noted that it would provide thoughtful reading. Chris has been a contributor of ideas to the Armor Force for many years. Unfortunately, his letter is terribly off mark. So, as the Chief of Armor's agent for Armor Force modernization, I offer our readership the following informed comments:

The Armor Center has been part of the TRADOC System Manager Bradley's team in the development of the M2A3/M3A3 BFV. Armor Center combat developers have participated at every level and event. The Armor Center's Directorate of Doctrine Development and the School are working to incorporate the M3A3's improved capabilities into doctrine and our POIs. The M3A3 will provide our division and armored cavalry scouts with an improved platform and sensors for mission accomplishment. Unfortunately, as MG (Ret.) Tom Tait so often notes, it still is "scouting in a Winnebago."

The Armor Center recognized in the mid-1980s that the Bradley did not provide scouts the capability for successful mission accomplishment. The Center, with cooperation from other TRADOC schools, instituted doctrine, leader development, training improvements, and materiel changes in order to overcome deficiencies. When the BFVs in battalion scout platoons were replaced by HMMWVs, scouts penetrated deeper at the NTC and accomplished more missions — size does make a difference, but scout survival only marginally improved. NTC results showed, over and over again, that when scouts were successful, the task force chances of mission success dra-

matically improved. Reconnaissance and surveillance capabilities were judged to be the most serious mounted close-combat deficiency.

From the mid-1980s onward, the Armor Center conducted various concept studies with the S&T community and searched for a definitive strategy. This was part of a broader effort that included such issues as retaining tanks in the division cavalry squadron, reconnaissance squadrons in light divisions, and a brigade reconnaissance troop. Desert Storm after-action results further substantiated the need for a new scout system and provided further momentum. A series of meetings with British and German counterparts were conducted as part of the Armor Combat Development Exchange Program (ACDEP), but produced no new solutions. Nevertheless, a Future Scout Mission Needs Statement was prepared, approved by HQ TRADOC and DA, but not forwarded to the JROC. An acquisition plan was required.

A 1996 TRADOC Integrated Concept Team crystallized efforts by drafting and presenting a broad set of requirements and a plan of action. More than three years ago Armor senior leaders set a new course to equip future scouts with a platform that is optimized for reconnaissance and surveillance, rather than further modify the BFV. That same summer, an ACDEP exchange revealed a unique opportunity to pursue a collaborative scout program with the U.K. This last point, in conjunction with an innovative new acquisition streamlining approach from DA, provided the impetus to launch a new program. Incidentally, prior to the signing of a Memorandum of Intent between the two countries, an independent analysis showed that simply putting a mast with a sensor on a BFV did not result in increased scout mission performance. The Future Scout MNS was subsequently adjusted and approved by the JROC. A U.S. and U.K. Combat Development team then jointly crafted a Combined Operational Requirement Document for the first phase of the program.

Unfolding doctrinal changes also provided Senior Army leaders with rationale for the FSCS. Obtaining and sustaining information dominance in knowledge-based warfare is an essential component of Force XXI operations. The TF and Division Army War Fighting Exercises showed that the ground scout's role becomes more critical in satisfying CCIR in a timely manner, even with the addition of UAVs and other aerial sensor platforms. Army After Next and other studies highlight the need for rapid inter- and intra-theater air deployment. So we are seeking a medium-weight C130-deployable system, optimized for mounted reconnaissance and surveillance in Force XXI and beyond.

The FSCS/TRACER program is a collaborative venture with the U.K. that is the Army's first Fast Track acquisition program. It seeks the latest in technologies by not locking in designs early. Both nations bring a tremendous suite of knowledge and experience to this effort. The concept article on FSCS in the Jan-Feb *ARMOR* edition by Asher Sharoni

and Lawrence Bacon is a thoughtful work that I recommend to readers. It embodies many of the components we are seeking.

But what about the near term for the battalion scout platoon? Senior Armor leaders also recognized that the complete inadequacy of sensors within the battalion scout platoon could not wait for FSCS in 2007. The Long Range Advanced Scout Surveillance System (LRAS3) will fill this void and provide M1114-equipped battalion scouts with a greater sensor capability than the M3A3. This will enable greater standoff detection, survivability, and far target location accuracy for the HMMWV-mounted scout. LRAS3 will be rolled over to ARNG scout platoons with the fielding of FSCS. See *ARMOR Magazine's* November-December 1998 issue for a detailed discussion of LRAS3. A mast-mounted sensor on a HMMWV was rejected as an interim solution due to affordability. LRAS3 provides a solid and affordable capability to our battalion scouts in the near term.

We have also been examining for the last year a variant of Land Warrior for dismounted operations by our scouts. This could provide exciting capabilities, but must wait due to affordability concerns and the re-baselining of the Land Warrior program.

The Chief of Armor is executing a scout strategy that is the product of extensive research, analysis, and debate. To suggest that he or the Armor Center do not take our responsibility seriously is ludicrous. The FSCS will provide the mounted scout the right tool to get his job accomplished in the 21st century.

JOHN F. KALB  
COL, Armor  
Director, Force Development  
USAARMC

### Simulation in Training: The Other Side of the Story

Dear Sir:

COL Guy Swan's article, "Computer Simulation Fallacy: Assuming Troops Are Well Trained," in the Jul-Aug 98 issue was a well-written, thought-provoking piece that is of interest to those of us who consider ourselves professionals within the simulation industry. We are very cognizant of the continuing need for training in the dirt, for which it is unlikely there will ever be a suitable surrogate. However, for a number of reasons (operating and ammo costs, availability of time, environmental issues, etc.), live training time has become increasingly precious. I believe the real question raised by COL Swan's article is, "When will our computer simulations better replicate and prepare our soldiers for the limited *live* training that still exists?"

Disturbing, however, is COL (ARNG, Ret.) Robert Fairchild's letter, "Excessive Simulation Breeds Training With Little Basis in Reality" in the Nov-Dec 98 issue.

COL Fairchild's letter starts with a somewhat mean-spirited generalization attacking the

simulation community: "The simulations industry has been a gold mine for retired soldiers now in the private sector. They have seduced policy-makers, who should know better, into believing that armor and mech units can be trained on the cheap, and that no one need any longer scrape their knuckles disconnecting final drives in the dark."

It's unfortunate that COL Fairchild holds these views. He has it wrong. Professionals in the simulation (or defense) industry, many of us ex-soldiers, care deeply about our responsibilities to the Army in today's challenging climate. Many of us feel we still wear the uniform under the suit and believe that any company marketing a training product (simulation or otherwise) that doesn't significantly enhance readiness won't be in business very long.

My personal simulation experience started in 1985 while commanding 2-64 Armor in Schweinfurt, Germany. Well experienced in tank gunnery, I was skeptical of the ability of the newly fielded M1 Conduct of Fire Trainer (COFT) to assist in preparing our crews for Tank Table VIII. To find out, my gunner and I put in many late hours on the COFT to assess its value. And, WHOA, was it good! The ability to watch, coach, mentor and assess TC-gunner teams in the relative comfort of the COFT provided an ability to TRAIN that was never achievable at midnight in the "back 40" while sitting on the roof of one of our tanks in a driving cold rain and 35° weather during a dry-run TCPC exercise. Fact: Being cold, wet, or otherwise uncomfortable never improved gunnery training — it DETRACTED from it.

We quickly transitioned from COFT skeptics to COFT zealots, encouraging our battalion's crews to achieve high levels of proficiency on the COFT while their leaders watched, coached, and reinforced their own skills. The battalion proved just how good our belief in the COFT really was during our next trip to Grafenwoehr.

Quality simulation translates directly to improved performance in the field where "live" simulation takes over. To this day, I doubt many really understand the dramatic improvements in tank gunnery standards (Ph, Pk, opening times, etc.) that were/are attributable to the COFT or today's second generation Advanced Gunnery Training System (AGTS). I believe the same will soon be true of collective training simulations, both at the joint level and within the individual services.

As one who frequently visits Army posts, I detect a far greater threat to readiness than an overabundance of simulation — I detect a lack of resources, to include a dearth of quality training time — simulation or otherwise. How many hours per month do TCs and gunners spend in their AGTSs? What is a battalion's average Reticle Aim level? How frequently are units firing Table VIII (can't be too many, as I rarely hear a main gun round pop, even at Ft. Hood). How many days do company commanders have in the field with their units? Even road march skills, once one of the best visual indicators of a well trained and

disciplined unit, are being eroded by loading tanks on HETS to move from the motor pool to a local maneuver area or range.

Our challenge within the simulation community is to make the simulations we are building capable of maintaining high levels of proficiency and *mitigating* lost time in the field. It's a challenge we in industry take very seriously.

I believe the tempo and topics of discussions in *ARMOR* and other professional journals relating to the pros and cons of simulations cannot be generalized. Let's not forget the basics — tasks, conditions and standards. Simulations are improving dramatically. The frustration being voiced by many is really being directed at the inability of legacy (mostly constructive) simulations to keep pace with today's spiral development process. JANUS, CBS, SIMNET, etc., are all showing their age and are not able to easily link with or fully stress our emerging C4I systems. The patience of those responsible for training in the field with a mix of old and new hardware is wearing thin. The generation of emerging virtual and constructive simulations, such as the Close Combat Tactical Trainer (CCTT), Warfighter's Simulation 2000 (WARSIM), Joint Simulation System (JSIMS), etc., will resolve many of these deficiencies.

This is a challenging time for both combat and training developers. The fielding of new simulation systems is taking longer than we would like, due both to budgetary issues and technical requirements to develop flexible architectures responsive to dynamic hardware and software changes. In summary, training systems lag behind hardware systems — this is nothing new. This time, however, as revolutionary new information systems are being fielded, the training systems lag is more apparent and is having a more noticeable impact.

I assure you, the pledge of simulation "professionals," both in Government and industry, is to provide robust, modern simulation tools that will better prepare soldiers for live training or war. WARSIM, CCTT, JSIMS, and other tools, once fielded, will offer dramatic improvements over the legacy systems now in use.

Keep the faith! But please, don't ever question our support of the force!

COLIN L. MCARTHUR  
COL, Armor (Ret.)  
Orlando, Fla.

### The Problem with BEAMHIT? It Isn't Authorized, He Says!

Dear Sir:

First, let me salute the officers and NCOs of C-3-81 AR for their initiative in not only using an untried training device but also for developing Marksmanship Programs of Instruction (POI) to go with it.

*Continued on Page 49*



# COMMANDER'S HATCH

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## The Armor Force: A Pre-conference Overview

by MG George H. Harmeyer, Commanding General, U.S. Army Armor Center



The theme of this year's Armor Conference, "ARMOR; Spearhead to the Future" is not simply a catch phrase devoid of meaning. It is an affirmation that the Armor Force's traditional pre-eminent role will be sustained into the foreseeable future across the spectrum of conflict. In this article, I want to preview the Conference theme with a broad overview of the status of the Armor Force and highlight some key directions.

### General

On a given day, the U.S. Army has over 25,000 soldiers deployed to nearly seventy countries, keeping the peace and providing stability in a dangerous and unpredictable world. Our Army's tankers and cavalymen are doing their share and more. Tank crewmen and cavalymen are the most deployed military specialty in the Army today. From Bosnia to Southwest Asia, time and again the Army has shown that the most effective means to demonstrate the seriousness of U.S. resolve is to deploy an armored force. When tanks are on the ground, people take notice.

Since the collapse of the Soviet Union, we have implemented the most fundamental change in our Army since World War II despite fourteen straight years of declining buying power, yet we have kept the force trained and ready. I would be less than candid to say that the force is uniformly trained and ready. Due to constrained resources and the high tempo of operations across the globe, certain units have been unable to maintain the level of training and readiness of the deployed units. Despite signs that the trend towards resource reduction may be turning around, we should expect to continue a mindset of high OPTEMPO with very limited resources.

There is no secret that the key to continued success is people. Our principal readiness concerns are continuing to recruit, retain, and take care of our soldiers and their families. If we are unable to

recruit and retain enough high quality young men for the force, then we're not going to be able to sustain success.

Today, we have an Army that has become increasingly based in the United States, relies to a large extent on the National Guard and Army Reserve, and must be able to deploy anywhere, on short notice, with a decisive force. The Armor community has led the Army's efforts to train and equip the evolving force and to teach it how to think and fight in revolutionary ways.

### Doctrine

A primary effort in doctrinal development is to refine incorporation of the digital effects on operations. As the 4th Infantry Division continues its effort, we continue to gather the TTPs associated with its exercises and incorporate them into doctrine for use by the rest of the Army. We realize that almost every Armor and Cavalry unit has some digitized equipment; the bottom line is that we write doctrine for everyone.

We expect to have *FM 71-3* in final draft as this edition of *ARMOR* gets to you, and we expect *FM 17-97* will be in final draft by August of this year. We are developing TTPs for the deployment of the three-company battalion task force of the Force XXI design. These TTPs will be tested during Force XXI limited conversion in the 1st Infantry Division and applied to the 1st Armored and 3rd Infantry Divisions.

Our doctrine needs to look at least as far forward as the technology that will be used to implement it. Enlisting force developer assistance in the draft of doctrine for new systems, like the Future Scout and Cavalry System and Mounted Warrior is one way we can achieve that end. Doctrine must be relevant and appropriate for the equipment to which it is applied. Input from the field is essential. I encourage broad input to electronic drafts we routinely post to the internet and also

a direct dialogue with the Armor Center folks here and when they travel out to Training Centers and the places where you are assigned.

### Training

The changing global operational environment requires Army trainers to re-look how training can be most effectively and efficiently accomplished for the Total Army. We are pushing ahead with the support of TRADOC and the assistance of the Infantry School and the Reserve Component to articulate a Mounted Training Strategy (MTS) that meets the needs of the Total Army. The MTS seeks to maximize the potential of all training environments with a focus on individual, staff and unit proficiency in selected "core" tasks across the full spectrum of conflict. For more information about the MTS, see the Jan-Feb '99 "Commander's Hatch."

The overall capabilities of our weapons systems have outpaced the ability of our live-fire ranges to challenge them. We have designed the Digital Multi-Purpose Range Complex (D-MPRC) featuring expanded width and depth, incorporating the next generation targetry, and numerous technical innovations to continue to challenge our soldiers. The solution calls for a "holistic" approach that integrates live fire, maneuver, simulations, TOC training and after action review capabilities to train staffs, leaders, and units to use information dominance to attain precision maneuver as well as fires to shape the battlefield.

We increasingly recognize that the ability of Mounted Forces to fight in an urban environment is more important than ever. Although the Infantry School retains the lead on MOUT, our role in developing TTPs is increasingly important. The construction of a Mounted Urban Combat

Training Site at Fort Knox supports this effort. This state of the art facility will have links to the virtual and constructive training environment. It has drawn great interest from across the force to include our sister service; the United States Marine Corps.

The principles of the Eight-Step Training model underpin our training doctrine. I charge Armor trainers at every level to rededicate themselves to the application of this model. The thoughtful implementation of the Eight-Step model throughout the training cycle, especially the correct adherence to the doctrine for the conduct of After Action Reviews, cannot help but yield tremendous results.

The cornerstone of Armor's institutional training future is embodied in our concept for the University of Mounted Warfare (UMW). UMW is a plan for the future Fort Knox school house that fully supports the Classroom XXI vision by leveraging the power of information age technologies to include computer-based instruction, distance learning, and simulations training. It will allow us to train digital warriors using the same tools and Force XXI training products students will work with in their units of assignment.

The institutional Officer Education System has witnessed broad and bold futures-based innovations. Last year, the Battalion Maintenance Officer Course was the first fully exportable institutional instruction offered on CD-ROM. In December of 1998 we started the first internet-based distance learning RC-AOAC course. The course has progressed into synchronous IDT internet training and will culminate into a third AT phase featuring synchronous simulations exercises. We are facing the challenge in our officer courses of reducing course length while sustaining instruction of essential competencies. The new 18-week course, renamed the Armor Captain's Career Course (ACCC), is one such example. Future courses to prepare digital leaders appear likely to require longer, not shorter, course length. In November of 1998, the Armor Center conducted a Digital Instruction Experiment (DIE) that will pave the way ahead for the future Digital-ACCC.

For institutional NCO training, our current effort has been a major rewrite of all CMF 19 NCOES Courses in FY 97/98. Armor Center's CSM Lady provided an excellent status report on NCO Academy developments in the previous issue of *ARMOR* magazine. Renovated classrooms, billets, and administrative facili-

ties along with installation of fiber-optic wiring in classrooms has postured the NCO Academy for enhanced training opportunities in a Classroom XXI environment.

### **Leadership**

We are a small branch with a growing concentration in the Reserve Component and with more of a CONUS base than in the past. There is a great demand across the Army for the talents of Armor officers. This is a personnel management challenge, but is a compliment to the truly combined arms character of how we grow our officers. Many Armor officers, however, are not serving in key troop assignments as long as they should. Captain shortages across all branches are a key concern, but Armor has particular difficulty in meeting branch-qualified demands given our small size. Additionally, the Armor Force is required to fill a large number of AC/RC slots. Units and organizations have paid a price in increased turbulence, an increase in assignment "under-lap," and unfilled positions. The restructuring initiatives of CINCOS have provided challenges to NCO management parallel to those that the Officer Restructuring Initiative (ORI). In the schoolhouse, we have witnessed an unfortunate decrease in seasoned instructors, the ratio of instructors to students, and the experience level of our staffs.

### **Organization**

The Armor Center is the Spearhead of the Army Experimental Campaign Plan (AECPP) to take us through Force XXI to Army After Next and beyond. A key component of this plan is a number of organizational design changes. The force design for Force XXI will eliminate a tank company from tank battalions, reduce mortar platoons to four guns, allow for six scout vehicles, and modify the HHC's CSS platoons. Already we are standing up and training Brigade Reconnaissance Troops in Europe. This organization will have two six-vehicle scout platoons with a Field Artillery striker platoon in direct support (DS). The "bubbled up" demand for 19D Scouts is a challenge. Divisional Cavalry Squadrons will pick up the NBC Reconnaissance Detachment from the current divisional chemical company organizations. A third axis of the AECPP has been added alongside the light and mounted axis. The Armor Center is the lead proponent in concept development and experimentation of what we term "Strike Force;" a rapidly deployable contingency force. The near-

term focus is on a HQ designed with world class C4I.

### **Materiel**

Sustaining combat overmatch is a key component of the Army's modernization strategy. Planned Programmed Product Improvements (P3I) will be required to maintain this overmatch. Abrams Integrated Management (AIM) is the program for tank refurbishment. The program seeks to get the right, yet achievable mix over time of Abrams variants (M1A1, M1A1D, and M1A2s) with associated product improvements into the right units. The M1A2 will maintain an overmatch differential through the mid-term but the M1A1 capabilities will be overmatched in the near-term. Selected overmatch sustainment modifications have been identified for the M1A1 (FY 06) and the M1A2 (FY 12).

The Abrams tanks in the ARNG are the oldest in the fleet. A re-capitalization plan is needed to ensure the ARNG tanks maintain their survivability and lethality overmatch. Cascading tanks from the active component to the ARNG will provide the initial foundation; however, the ARNG needs to be fully integrated into the Army's Armored System Modernization Plan.

The Scout Strategy combines materiel fielding and development with the organizational and training changes already addressed. The materiel component will witness the near-term fielding of the M3A3 and up-armored HMMWVs equipped with LRAS3, laser range finders, and high resolution day TV. The Future Scout and Cavalry System is a concept vehicle that will have a multiple advanced sensor array, automatic acquisition and identification, advanced C4I and stealth features. We look to field the system in FY 07.

The Command and Control Vehicle (C2V), the replacement for the M577, is on track in terms of development but appears to be falling short in fielding. The Army's Procurement Objective (APO) is 102 C2Vs; however, a minimum of 130 C2Vs will be required for the First Digitized Corps.

### **Soldiers**

I said at the beginning that recruiting and retaining quality soldiers is critical. Everyone is aware of the tough task that confronts all service recruiters in today's

*Continued on Page 51*



# DRIVER'S SEAT

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CSM David L. Lady  
Command Sergeant Major  
U.S. Army Armor Center



## Sergeant's Business: Training Soldiers, Training Records, Training Meetings

Should go without saying, shouldn't it? That we NCOs are responsible for training individual soldier and crew skills; that we NCOs must record our soldiers' training status; that we NCOs must assess our soldiers' training status, and help plan/execute the training that corrects any weaknesses.

Yet, at the most recent Senior Leader's Training Conference (SLTC), our most senior commissioned and noncommissioned leaders agreed that their units are not training well, and that too many of their units are not well trained in "the basics" (individual and collective skills). Many reasons for this situation were discussed; among them high unit OPTEMPO, short leadership and staff assignments, lack of resources (time, training area, money), and unfocused training environments (can't train the important tasks because higher guidance does not identify or enforce what is important to train). Junior leaders were criticized for not understanding our Army training doctrine (*FMs 25-100* and *25-101*).

After Action Reviews from the CTCs reinforce these senior leader perceptions. Units arrive at the NTC or the CMTC without the ability to execute collective tasks to standard. Weaknesses in simple individual, leader, and crew tasks, which must be trained/learned before collective task improvement can take place (for example, precombat checks, preventive maintenance inspections, MILES bore-

sighting, actions on direct or indirect fire contact, first aid and casualty evacuation), hinder unit learning curves.

By the end of the SLTC, a number of suggestions for improvement were made by commanders and command sergeants major. "Get back to the basics" was one. "Train our junior leaders in their training management role" was another. Despite such problems as OPTEMPO and money, we NCOs can improve our unit situations by reemphasizing our role in assessing and executing individual and crew-level training.

I ask all armor and cavalry leaders to look at your own unit's training management cycle. Review *FM 25-100* (especially Chapters 1 and 2) and *FM 25-101* (especially Chapter 2, the "Near-Term" and "Preparation for Training" portions of Chapter 3, and Appendix "G"). Find and use *TC 25-30*, "A Leader's Guide to Company Training Meetings." (I am amazed at how few NCOs know that this circular exists!). At the individual level, our readiness can be dramatically improved in five steps, even without two-year platoon leader tours or buckets full of money from Uncle Sugar.

Know your company METL, your platoon battle tasks, and select all the individual and leader tasks which support (link to) these collective tasks. For an armor NCO, it means working with your fellow leaders to select from *ARTEP 17-*

*237-10-MTP*, *FM 17-15*, *STP 17-19K23-SM*, and *STP 21-1-SMCT*. It requires a lot of time and attention to detail, but we must know what our team must do.

Create your leader book, and use it! I don't mean a "cheese book" for a Morale or Audie Murphy Board, I mean a useful and constantly used training record! However you organize it, a worthwhile leader book must list company METL and platoon supporting tasks with assessments; CTT proficiency (these are basic survival skills); essential soldier task proficiency and status; and crew or section collective task proficiency. Of course, the soldier-administrative data will be in your book, but I am emphasizing the leader's book as a training record. With the aid of Appendix B, *TC 25-30*, the Standard Army Training System (SATS) software package, and a personal computer, a well-organized leader book can be created in less time than it took SFC Lady to make one with pen and typewriter (I will always be grateful to SFC Frank Partyka for loaning me his computer-generated book, and for the battalion Xerox machine being next to the staff duty office!).

Assess your soldiers' and crews' proficiency, and tell your leaders what needs to be trained next. Tank commander/scout section leaders had better be pre-

*Continued on Page 51*

# Controlling Armor's Destiny

by Brigadier General John Kirk (Retired)

*Although we pay a lot of lip service these days to the need for original, "out-of-the-box" thinking, my IN basket does not run over with unorthodox story ideas or revolutionary concepts. These seem to come more frequently in phone conversations with John Kirk, who remains engaged, concerned...and usually right...after 15 years of retirement. So, dammit, listen up... —Ed.*

Armor's active component is an endangered species. We're fat, slow deploying, and too terrain-restricted and logistically hungry for a force projection Army. And we fight *mano-a-mano*, which means casualties. In contrast, the Navy and Air Force can deploy fast. Precision weaponeers of our own and brother services claim the ability to achieve politically popular, allegedly cheap, "nearly bloodless" victories alone. As a result, we're losing battles of survival at TRADOC, DA, the Joint Chiefs of Staff (JCS) and Congress. Armor's life is at risk.

## THE CHALLENGE

The purpose of this article is to throw down a gauntlet that challenges the men of armor and cavalry to fix that — to design and control your own and your branch's futures. Our brotherhood seems to have lost its historic long-range perspective, focus, voice, and impact. Process has become our major product. If this and other military journals are indicators, our mental mobility and future vision have dimmed. The void in contrasting futuristic arguments hints that political correctness may be suppressing concerned divergent views.

## THE MESSAGE

Our thinking and objective operational systems must reach for a distant horizon, unconstrained by the concepts, systems and support structures that are the suboptimal tools of our times. **"Armor isn't a branch of service, it's a state of mind"** is an aging but pertinent maxim. It's now more crucial to Armor and the Army than at any time since the 1930s. Successful Armor leaders, cavalrymen, and fighter pilots share similar skills and mindsets. Systems are secondary to their "state of mind" in battle — competence, clear concepts, decisiveness, attack spirit, courage, perspective and flair.

We're custodians of that spirit, not a thing called Tank or singular branch of service. Our heritage is creation and decisive employment of joint/combined arms teams with firepower, protected mobility and shock effect to win battles, wars, and perform operations short of war (OSW).

## A BEGINNING

The "challenges" of Force XXI rightly concern many soldiers. We need to shake that dinger, fix the force, and move on — fast. Despite bruised feelings and honest doubts, digitization, info systems, target acquisition and precision fires are needed operational evolutions (EMA). They're speed bumps, ramps and transitions, not a "revolution." From my grille door view, new

system "leverages" are surprising mostly in their mechanical, experiential, operational, and conceptual fragility, not innovation or exploited technology. Brigade and Division XXI look like recycled, decades-old ideas. But whether Rev or Evolution, new systems must make our "varsity" as winning joint/combined arms teammates, not islands. Their toughest tests are yet to come — field-proofing by troopers that busted the Army's last improved anvil. All hands need to take part, with ruthlessness — even harsh — fairness and integrity.

We all need to take disciplined "time outs" from duties and monitors to view the world farsightedly and refresh our "state of mind." Then we need a blitzkrieg — fast, focused, coordinated, *sponsored* action before Armor's future is surrendered *nolo contendere*, outrun or outflanked by other branches and services. Read *Armed Forces Journal International* (AFJI), October 1998 issue, let your blood boil, then firewall your throttles to:

- **Take the initiative with a forceful, focused breakout from encirclement to control Armor's doctrinal and operational future.** Draft *FM 100-5*, '98, was withdrawn from circulation/comment — again. Good news! Bad book! Its recall was *prima facie* evidence of doctrine's unstable future concepts gyro, ours included.
- **Use futuristic operational concepts to redefine, validate and refine Armor's long term roles, missions, and systems.** The shape of future battle, strategic deployability, joint/combined arms conventional operations, those in difficult terrain and Operations Short of War (OSW) remain huge issues.
- **FORCE science and industry to get their snouts out of the slow-moving, low/no risk government dollar feed trough** to develop the capabilities mounted arms need to meet future strategic requirements and complement the projected operational abilities of our brother services.

## DISHARMONIES

Armor's future world-mobile, multi-mission combined arms doctrine and team are at risk in a vacuum. Senior leaders are trying to meet present needs, satisfy the political, technical, and budgetary interests of "higher" and industry while the force dukes out today's ground truth. In the meantime, our future's doctrinal horse is a runaway headed for the Beltway Corral with too many riders. It won't be broke right by The Compliance Chorus, SAMS' Chanters, Jargoneers or Fiscal Strings.

The doctrinal vacuum, digital evangelism, damaging budgets and "missions too far" are corrosive to the spirit that's central to the joint/combined arms team's now and future capabilities.

To many, it seems that operations and outfits are being force-fitted with stovepipe or *ad hoc* systems, not integrated functional ones or tailored applique. "Revolutionizing" seems to have attitudinally divided our combined arms into (Bill) Gatesian indentured strata instead of the teams that are Armor's vital commodities. At the high end of the food chain, in environmentally controlled splendor, are the info, process, and precision warriors. Middlemen target and send undigested data masses down. The low end seems to be the combined arms, now appar-

ently relegated to base establishment, housekeeping, and killing trickle-throughs.

Doesn't look or sound like joint/combined arms or any possible future battlefield to me.

### OPPORTUNITY KNOCKS

Rifts are constructive opportunities. A unifying joint/combined arms operational concept (construct) must be the driving force behind new doctrine and future systems. Clear, clean, impartial concepts must displace zealotry and uncertainty, then be imbedded in people, schools, system designs, operational tests and go to war (or close to it). Troopers in the holes, hulls, cupolas and CPs of the Armor Force need to mount up, take *their* initiative and challenge the system to make the positive, assertive, forward-looking changes that Reforge the Thunderbolt.

### REFORGING THE THUNDERBOLT

*"Forge...to beat into shape." Webster*

"Reforaging's" Line of Departure is the Principles of War. Paraphrasing Will Rogers' famed comment on weather, "Almost nobody talks about the Principles of War and nobody does anything about 'em." We need to cross the LD with common sense and plain talk leading. We must modernize, then integrate the Principles into a coherent body of things good leaders and outfits really do, not let them continue to stand as moss-gathering totems. History, experience, and reality must be merged smoothly with operational/technological developments in a flexible, mission-centered way. Our doctrinaires must get to the core, say what they mean simply and cleanly in our profession's language, free of distorting "interdisciplinary" jargon, foggy metaphors, fuzzy logics and abstruse ideas. Their products need brutal probabilistic tests against the next century's known and potential threats in real places, with critical audiences, not demonstrations among friends and "interests."

*FM 100-5 ('98 Draft)* said "...Principles...are the foundation of Army doctrine." Yeah, right! So *that's* why writers led them with 22 pages of superfluous executive summary and intro explanations with text by operational dilettantes, systems analysts, engineers, designers and code-writers. Wrong stuff! We need to shut down, then restart the engine of change. Here's an approach to creating a "type" framework and logic that leaders and technocrats can use *to mutually shape technology into operations' hammer* rather than stamping joint/combined arms into shapes determined by technology's human nature-free, process-oriented mechanics:

- **Update the Principles of War (Operations).** Displace Centuries 18/19 to Century 21 ASAP. Year 1800 concepts don't fit the weapons, concepts, or experience of the last 200 years or 2010/2025 estimates. Impose high probability demands on information systems, weapons, forces, multi-mission operational concepts and human factors.
- **Connect 'em with what outfits really do.** Get "principles" into a context everyone can understand and use. Institutions and leadership must create an operational construct and spread it throughout the force so that E4 through fielded O10 have shared concepts and the tools to execute them. Then we must create a reciprocal top-to-bottom climate of absolute mutual trust and gain freedom of action from our superiors instead of their mission and careerist fail-safe constraints.
- **Project them into the future.** More later.

### REFORGING I — HAMMERING (Confessions of an Iclauseclast)

The Principles of War have become an atrophied, unaccountable list, not organs of a living, evolving operational being. We've perpetuated dated concepts — levels of war as a construct, Mass and Offensive as Principles, determinism as a strategic/operational calculus. We, like the classicists, are looking for the yellow brick road to "certain" success, fighting past wars deterministically better, not future ones probabilistically well.

The Principles were first published as War Department Regulations No.10-5 in 1921. In the 78 years since, and lacking assertion-challenging institutional or academic cultures in our Army, we've questioned them less than involved, educated professional soldiers should. We and our field manuals have repeated 18/19 century fossils like nodding dogs. Wordsmithing has been substituted for thoughtful changes to compensate for the hugely altered dimensions, conditions, and tools of 20th century war. The lapse has often profoundly damaged or retarded Army doctrine, systems and battle performance.

Clausewitz' "*Vom Kriege*," 1832, is widely accepted as forming much of the theoretical foundation of the art of war. It's gained and retained neo-biblical status. His works and those of other "masters" of military theory — Du Picq, Jomini, Sun Tzu, *et al*, (Who's read Seversky, Douhet, Mahan?) have earned our admiration, not fawning recitals. They'd have expected better of us than rote repetition in the face of sweeping geopolitical, socioeconomic, and technological changes in this century.

"Visions" being "in," here's one — Clausewitz, Du Picq, & Co. (absent Fuller), in Bierstube Valhalla, sobbing or laughing uncontrollably because we haven't updated their stuff in 100-150 years. Think about it. What's the likelihood that those bright guys' ideas would be unaffected by: rifled/automatic weapons; internal combustion engines; global mass transport; flight/aerospace power; ICBMs; nukes; acquisition means; telecommunications; info technology; huge jumps in weapons ranges and lethalties; geography; socioeconomic structures; others? C'mon, doctrinaires and reviewers, think again.

We need a reality check. Many of Clausewitz's loudest champions are pretenders. No one used Clausewitz or the Principles of War in my 27+ years' service — in command guidance, war plans, orders, exercises, critiques, or after-actions (AAR) from platoon to department, peace, war or at the NTC — except me, badly. Almost no one's read his 19th century original. Few have struggled through his translated tangled logics and turgid prose. In their essays in *Makers of Modern Strategy*, Rothfels ('44) noted that "*On War*...is reverently called a 'classic,' though one that seems more quoted than actually read." Paret ('86) said Clausewitz's "...influence on the manner in which wars are prepared for and fought is difficult to discern and even harder to verify."

**Levels of War** - Clausewitz's simplistic concept of three levels of war — strategic, operational, tactical — reflects a small nation and its continental conflicts in simpler times. Today, our Armed Forces serve in a volatile world whose aerospace systems, geopolitics, global transportation, and telecommunications have added complexities Clausewitz never imagined. Army doctrine must now embrace not just war, but the spectrum of operational tasks U.S. forces may perform.

A couple of examples tell the tale. The two-team, locked and loaded Task Force Tyree that confronted the Soviets at Berlin's Checkpoint Charlie in 1961 was controlled by SACEUR under the National Command Authority (NCA). Its commanders



knew they were strategic instruments, not mere “tactical” units. President Lyndon Johnson’s Red Rocket messages, circa the mid-60’s, could reach a force of any size and stop its action in minutes. We’ve seen similar deviations from Clausewitz’s theory in the Dominican Republic, Panama, Bosnia, Mogadishu etc. The NCA now often takes virtual control of parts or all of strategy *and* operations as it did in Desert Storm and last November’s recall of strike aircraft headed for Iraq.

Today, a single headquarters may fulfill the operational and one or two other roles simultaneously. Operations may be uniservice, joint, interdepartmental, combined or United Nations operations. The bottom line is that Clausewitz’s tidy concept just doesn’t fit our often complex goals, force mixes, and command and control, which are task-organized as needed in any combination (or omission) from these “levels:”

**Strategic.** Establishes policies, aims, provides resources, controls as desired.

**Operational.** Conducts operations to successfully prosecute the strategy.

**Task(s).** Loosely categorized as war (or combat) and Operations Short of War (OSW).

**Mission(s).** “Secure..Stabilize..Restore..” etc. Tactics are a mission function, not a level.

**Mass** as a Principle is dead, too. From Neanderthal man through the musket, massed formations were generally needed to produce winning combat power for forces armed with short range, limited lethality weapons. Clausewitz, “the Mahdi of mass,” deduced law from that past, but lacked a crystal ball. Mass shouldn’t have been more than *a* tactic or technique since the advent of rifled small arms and cannon. Technical evolutions were generally unrecognized by doctrine in WWI, except by the Germans at the Somme. Clausewitz’s disciples, Ludendorff and Foch, threw wool-clad soldiers at Maxim machine guns, rapid fire cannon and gas in mass “offensives.” Airpower, Sagger swarms, modern target acquisition, precision munitions, and exponentially increased lethality should have written *finis* to this notion. The crosses manning countless cemeteries from Shiloh to the Somme, at San Pietro, Huertgen, the Pacific, Korea, and Vietnam, as well as charred hulls from Algeria to the Euphrates, mutely demand elimination of mass as a principle. The constituency of our dead have a doctrinal voice we must hear — compellingly — or their sacrifice will have been vain.

**Superiority** of joint/combined arms combat power is mass’s modern descendent. Created at decisive times and places, it’s elemental to winning. Superiority normally results from maneuver and the focused effects of multiple systems. Mass, like infiltration, is a situation-dependent tactic to attain decisive **Superiority**. For obscure reasons, the change is unrecognized or not clearly articulated. “Effects of mass” (Draft *FM 100-5*), is an unstudied preservation of a bloody sacred cow. Such Closetwits should read Hart’s *Strategy*, Jomini and Napoleon’s *Maxims* 42, 72, 73, 74, 77, 81, 93, 95, and 115 ’til they pass Military Thought, K thru 8.

**Offensive**, conjoined with “mass,” was blindly adhered to in WWI, costing Europe a generation of men. It was little kinder to Pershing’s Army. Clausewitz hypothesized that the offensive was central to gaining the Initiative and thus was key to winning. Our doctrine has slavishly followed. Both are wrong. There’s no doubt that Initiative is vital to winning. The force having it plays the tune while the other guy dances. But early and recent history disproves Clausewitz’s “offensive” hypothe-

sis in both old and modern war. Nathaniel Greene wrote the “irregular” warfare book in our own Revolution. His exhaustion of Tarleton led to Yorktown. Tito, Mao and Giap showed us that, like Superiority, Initiative can be gained or seized in many ways, only one of which is the offensive. They include defensive-offensive, mobile defense, ambush, surprise, attrition, psy-war and other combinations of means, times, places and methods. An attack spirit and capability *is* central to successful offense, defense, or retrograde operations. An attack completes a strategic defensive-offensive for the winner.

**Simplicity** was in Clausewitz’s book, but he couldn’t think or write that way. Our concepts and language have followed his lead and need treatment as a sucking head wound. We can only hope we confuse our enemies more than us. We’ve created modern battle’s most effective obscurants with “military language” reports, orders, and “information systems” which make quantity and dominance synonyms! MG “P” Wood led 4th Armored in WWII without a single formal order. Conversely, we’ve created classic Clausewitzian friction with complex concepts; functional misfits (domains, cognitive, “branches and sequins,” etc); approval-seeking, trendy, murky verbiage; Malapropisms (asymmetry, synchronization); hosts of restrictive measures by no-casualties/zero-defect leaders; diarrheic intent; multi-word missions (where one would do); interdisciplinary jargon; newly coined words; complex maneuvers, orders, and control measures.

**Determinism Versus Probabilism.** Our operational theory and practice have been and remain habitually deterministic, a characteristic which history, logic and experience weigh heavily against. Few soldiers or their political masters understand probability in operations or how multipliers and risk-taking affect winning economically in war’s jungle of random events and probabilities. Let’s look at both.

- **Determinism**, endemic to man, is epidemic in the Army. The causes are complex. They start with playground logic: “I’ve got mor’n you got, so I’ll win.” When we enter adulthood discomfort arises over the uncertain game ends of life, death, and career. Many adopt rule-based value systems, “guaranteeing” a “successful” result: “If I do this, what I want *will* result.” Stairway to the stars personnel systems and *pro forma* measures like CTLs, ARTEPs, matrices, decision lines, and some checklists reinforce our early learning by seeming to guarantee “right” outcomes. It’s also a fool’s-safe approach to war and OSW, a comforting, simplistic logic that’s consistent with computers, but contrary to many acts of man, natural law, and probability. Operationally, it’s created: “correlation of forces;” mass-reliant frontal attacks; sieges; attrition warfare; indecisive, shallow envelopments; and slow recognition and exploitation of opportunities. Determinism demeans the intelligence, creative thought, will, worth and imagination of men on both sides. It also needlessly expends resources and kills soldiers in high density, low-to-no career risk operations. It exalts both correlation and diminishing returns — Monty of Alamein/Goodwood/Market Garden, Clark of Cassino, and Orlando at Anzio — counting tubes, rounds, treads, heads, fears and escalating resources toward an impossible probability of one (P=1) instead of weighing capabilities and opportunities. Determinism’s utility is limited — *rough* estimates, maintenance, pre-combat and prep-to-fire checks, pre-flights, small units and operations where Rule One, Rogers’ Rangers, means life or death.

- **Probabilism’s** more realistic, analyzing the “...likelihood...an event will occur..” or “If we do these things, we’ll

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*“It seems no accident that a good number of our better WWII leaders, civilian and military, were pretty good poker players. They understood risk, probability, human psychology and the likelihood that an event would or wouldn’t happen.”*

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probably get this result.” In war and life, probability’s king, randomness and accident its court jesters, diminishing returns a law. “Certainty” normally isn’t, and “probably” most often is. As a discipline, probabilism’s gaining fast among doctors and others who find that determinism’s rule-based logics or specialist medicine often produces marginal or just plain wrong answers. They’re turning (returning) to “whole-person” medicine. We should join ’em! Probabilism in operations isn’t science or mathematics! It’s a complex of “whole battlespace” situational estimates linked to FOCUS (see below). Its got to be taught historically, academically, in AARs and repeatedly in simulations. Hannibal, Napoleon, Jackson at Cross Keys and Port Republic, Grierson and Grant at Vicksburg, Patton, MacArthur at Inchon were probabilists. Guderian, Rommel and Balck, too, who did the “impossible” with 20-60 tanks. It seems no accident that a good number of our better WWII leaders, civilian and military, were pretty good poker players. They understood risk, probability, human psychology and the likelihood that an event would or wouldn’t happen. *Probabilistic tactics make deep and/or double envelopments, turns, deep exploitations and fluid defense majority, not minority, tactics and Speed a critical factor* in force operations. But, from Rommel’s papers, “...Men should never be allowed to get the feeling that...casualties have been calculated...that is the end of all enthusiasm.” Napoleon’s supposed to have said, “I don’t want marshals who are good, just those who are lucky.”

- Blending and situationally balancing determinism and probabilism is the right operational answer and must be embedded in the “art” part of war (See FOCUS, later). No single equation or method of estimation will work. Whole battlespace probability, *a minimum of prudent determinism*, and related evaluative disciplines are critical skills to be taught and practiced, cradle to grave, and be rigorously applied to war and OSW. Our officer and NCO corps have not been taught them, or practiced them in disciplined school, simulation, or active operations environments. The estimates taught in schools are long on processes, short on product, and a separate subject. Today, we must teach estimation in minutes and seconds, not hours or days. Tactical exercises should have *no less than* three

feasible courses of action with varying degrees of likely winning payoff, human costs, attendant risk, and rigorous examination of governing factors.

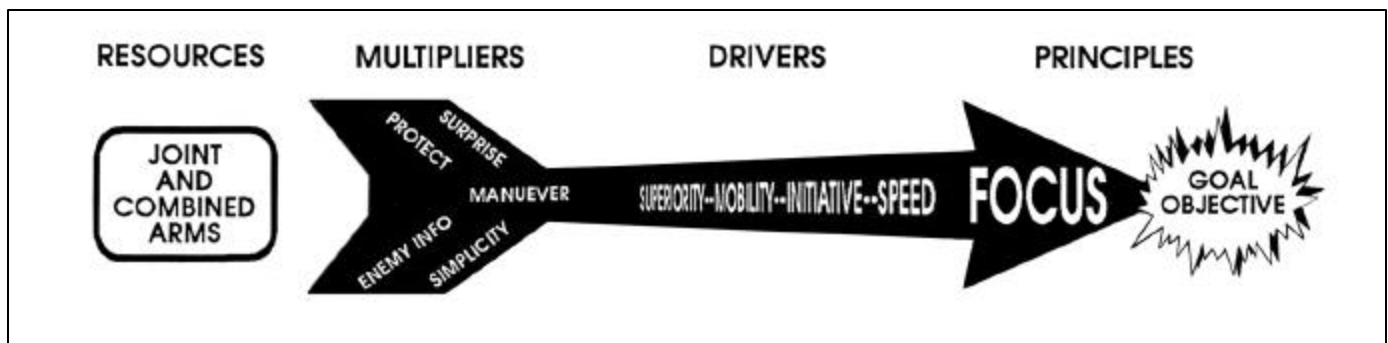
**REFORGING II:  
Blending the Principles, or Common Sense Operations**

Half a career ago, a CG asked his ADC(M)’s prediction of the division’s likely performance at the NTC. Reply: “If we don’t win, you should fire me.” They “won,” by throwing out the *FM 100-5* and training dogma of the time. Leaders, troopers, and serendipity evolved a doctrine for the division. Its two consecutive “winning” rotations left a demoralized OPFOR as their footprint in the NTC sand. There have been too few “winnings” since.

Twenty years of outcomes at the NTC show that we haven’t gained much from the adventure, doctrinally or operationally. The OPFOR was born to lose — to well-led, genuinely combat-ready (C1) outfits. Failure of BLUEFOR to “win” suggests serious shortfalls in doctrine, schooling, “mentoring,” force training, resources — or the will to tell it like it is. The NTC has long offered the Army an unprecedented world-best tool to measure its products, then correct deficiencies in the processes that made them. Its data could also provide the objective foundation for training budgets and readiness risk analyses for DoD and Congress, instead of the subjective guesses still used at the NTC or JRTC.

Doctrine based on ephemeral intellectual hypotheses and performance-shrouding euphemisms won’t fix what’s broke. Officials intone “great training”...“super leader learning”...and other phrases for losing. We’re only fooling us. Blue soldiers and unquotable outside observers mostly describe results as “We lost,” adverbied by “bad” or “again.” Rationalization isn’t readiness to troops. Transmogrifying “go to war” training into paint-ball games with camouflaged results and no accountability promotes denial, not candor. Too few grime time “Top Guns” in commanders’ hatches in an environment free mostly of free maneuver and loaded with constraining orders, control measures, and other initiative-killers, are clear predictors of their futures in live operations. Marshall MacLuhan said the medium is the message. The NTC’s message is Process=Product. We’ve busted the corporate leveling bubble, reversed alchemy, or built a perpetual motion mediocrity machine.

If war and preparation for it are man’s most perfect forms of waste, the only product an army can have is winning, anytime, at least cost, in its nation’s human or other resources. In that context, our Continental European-based doctrine doesn’t provide the sound conceptual footings modern war, operations short of war, or training demand. The construct below is a recreation and small tribute to thousands of men and women who



did or will do the job right – winning. It isn't too divergent from the "masters" and seems supported by history. It's a trial balloon for your consideration, argument, and hopefully one start point for Armor's future. Certainty ISN'T included. Whatever evolves, remember that every operation has an inherent degree of probability and risk you must identify, weigh, and be balanced for.

## PRINCIPLES

Principles are the bases for conduct of all Joint and Combined military operations in the accomplishment of a Joint force, national, or supranational purpose. There are two, GOAL (or objective) and FOCUS.

**Goal (or Objective).** *Define a clear, decisive, attainable and unambiguous goal (strategic) or objective (operational) for military operations.* At high levels, military force is used to accomplish largely political ends. Operationally, terrain or force objectives are often assigned as means to accomplish the overall goal. The goal or objective (aim in some armies) is the driving force for mission statements and concepts of operations. Clarity and Simplicity must dominate.

**Focus.** *Converge decisive, unified combined arms combat power and the collective will of the force on the fast, economical accomplishment of the goal or objective.* Focus functionally integrates minds, concepts, means and spirit to splinter (disintegrate, destroy coherence of, disassemble) enemy operations rapidly, defeat him in detail (piecemeal) with superior forces, exploit outcomes quickly to win at least practical cost in the nation's human and other resources. *Focus is simultaneously a principle of war, a property of the force and the battle art of command and staff.*

• **Focus, the principle,** *stresses disassembling enemy concepts, forces, and their will and ability to fight while retaining perspective of the operation's relation to and interdependency with the larger force.* It aims at disintegrating the enemy and killing them in detail (piecemeal) rather than a single large, destructive fight, unless that's the best or only option (kill with rapiers, not clubs). Converge all available means on contributing directly or indirectly to winning. Forces may, *but need not be,* physically massed in time or space. Integrate available combat power of all arms/services into unified joint/combined arms teams reporting to or cooperating with one boss to perform or support stated or implied mission(s). Prioritize (economize) to create superior joint/combined arms combat power in the main effort. Unity includes cooperation, supporting, OPCON or attachment. Assure mutual maneuver support in time and space, not just fires. If that's infeasible, weigh risks. "Simultaneity" violates Focus. Wrongly interpreted, it may unduly dilute the main effort, slow tempo, or cool fast burners by shooting too many targets with too many things at once. Birdshot's no substitute for concentrated fires. A similar malapropistic mistake created the "synchronized" corps' creeping steel trench in the Gulf.

• **Focus, the property** *is the ingrained ability of the force as a whole to execute operations using commonly shared concepts, methods, and tactics to accomplish the mission fast with minimum guidance or detailed control by commanders.* From squad to joint headquarters, shared understanding of the Army's concepts and methods of operations should — with mission, a sketch, and a small number of least restrictive control measures possible — convey command intent completely. Command at the critical point, not at a monitor, and

intercede only as essential. "Command/control what you should, not what you can" should be the Bible's 11th commandment! (See Letters, Jan-Feb '98 *ARMOR*, p. 55.)

• **Focus, the battle art of command and staff,** *is an institutionally taught, self-studied and mentored skill which results in a disciplined, integrated continuum of concept(s), convergent employment of superior joint/combined arms combat power and actions directed at attaining a goal or specific objective.* It is analogous to a lens — light from many sources is concentrated to produce controlled effects at a place and time. Focus is the commander's version of the fighter pilot's OODA loop (Observation, Orientation, Decision, Action). In single word Armyese: See; Sort; Orient; Decide; Act; Recycle.

See your battlespace, those adjacent.	Decide, fast ("Like lightning"—Rommel).
Sort out the mission's success vitals.	Act, fast (same).
Orient on exploiting vitals/fixing busted ones.	Recycle to See for continuous follow-through.

Commanders and staff, Army-wide, must be schooled and experienced so they share a habitual, almost subconscious, common operational concept and thought pattern. Staffs must use decentralized authorities to make their own estimates and take actions in parallel with fast (not hasty) command estimates, without guidance or approval, knowing that they and their commander have a high likelihood or certainty of reaching the same or similar conclusions and decisions. They complete anticipatory actions, often through and including warning orders, and some unit moves, and have to recall or modify almost none with command guidance and decisions only fine-tuning staff preps. *Linear, metronomic sequences cost time, inhibit early, free coordination/flow of ideas, and create event-driven execution, not opportunity-driven exploitation.* This characteristic of Manstein, Rommel, Balck, Patton, their chiefs of staff, and their staffs permitted dramatic feats of combined arms. At Tobruk, LTC Westphal, G3 of the Afrika Korps, recalled a Rommel-directed division attack on his own authority. A furious Rommel sulked, but said nothing. Westphal was right.

## DRIVERS

Drivers create force, disintegrating speed, high tempo, overwhelming momentum and/or psychological advantage in offensive, defensive, and retrograde operations.

**Speed.** *Attain/maintain the highest possible speed in everything the command does consistent with accuracy, carefully maintaining the distinction between accuracy and precision (often unrelated).* Lightning decisions, instant initiative on opportunities, rapid and accurate response to any valid order are keys to success of own, next higher and lower commands. Speed is reasoned and modestly orderly, haste often an ill-considered, imbalanced knee-jerk response. Speed exponentially increases shock effect of any action. It facilitates Surprise, by acting faster than the enemy expects, imbalances him with ability to hit him several times, ways, and places in a short time and clouds and confuses his estimate of you. It also creates quickness — fast response to orders, reports or threats to the outfit. It may give "armor protection" in some situations by making targets so fleeting the enemy can't engage. Unsure commanders who demand precise versus accurate information waste time, destroy speed, frustrate subordinates, and kill exploitable opportunity and troopers. *The distinction between un-*



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*digested, time-wasting data and decision-critical information must be made and disciplined without quarter, Army-wide.*

**Initiative.** *Seize and retain freedom of choice of where, when, how or if you will fight.* Gain Surprise by any means, maintain continuous pressure and high *apparent* operational tempo. Force the enemy to react to your threats, real or imagined. Exploit every profitable opportunity consistent with mission/risk. Use raids, patrols, limited objective attacks, sweeps, attacks by fire, interdiction and disinformation. Delegate exploitation authority to the lowest *competent level* with the abilities and resources. Leaders seeing a high value, low risk opportunity within the context of the operation should take it, report the decision and results, and support or join its exploitation by their parent command as a whole.

**Superior Relative Mobility.** *Gain and sustain the (mounted)(dismounted) ability of the force to move faster than the enemy under any conditions of weather (WX) and terrain.* Mobility is *not* mere movement of men and machines about the battlefield. Broadly, it's an integral comprised of the clearly focused mental, physical, operational, judgmental, and mechanical skills of the outfit as a team. Decisive maneuver almost always demands Mobility superior to that of the enemy. Next to Focus and Initiative, Mobility is key. Keep yours, restrict or remove his, and you normally win. Demand/attain near design rates of speed from troops/systems, despite often adverse conditions. High Mobility is an act of will and unit pride, leader through soldier. There are seven parts: mental; physical; speed (see above); fixing; weather/terrain; breaching/crossing, and recovery.

- **Mental toughness, the ability to inspire yourself and your outfit beyond norms, is basic** — toward design max of vehicles/aircraft. A near-fanatical “We can’t be stopped” spirit in crews, units, support. Max use of air fires, drops. In Table 91, Gulf War, command caution, control measures, and dressing artillery lines constrained speed, decisive maneuver, hence results. Imagination often needed. See Jackson, Sherman, Grierson, Crook, Moseby, Rommel Papers, etc.
- **Physical mobility requires intimate knowledge of men and machines.** Patton’s aphorism on fatigue applies to mental (above), soldier stamina, and maintenance. You must push the limits of human endurance. Logistics can kill mobility.
- **Fix by removing the enemy’s mobility with whatever works.** Use man’s/nature’s obstacles and USAF/Army Aviation in attack and defense to temporarily protect flanks. Paralyze small threats with quick MLRS strikes. Good deception can freeze enemy maneuver forces, reserves.
- **Wx/Terrain must be a leader’s personal field skill more than G2/S2/ALO estimation.** Needs keen observation/Imitation Intuition Extract (IIE) (Call or write). Ability to weigh Wx/terrain risk to advantage often beats pro-pessimists’ forecasts, produces biggest payoff with decisive maneuver/surprise. Use Cav/Scouts as themselves, not phony tanks or infantry. Commander and at least one crew/squad per platoon, corps wide, must be scout-trained. Maximize use of trusted detainees/EPW.
- **Breach/cross obstacles fast as in-stride, impromptu drills.** Engineers up! Deliberate’s slow, costly — a method for the unskilled, unready, or Volga crossings.
- **Recovery/evacuation is a drill skill and art d’triage through corps.** It should never slow mission accomplishment. Mutual recovery is a vital capability to maintain unit strength

and integrity. It mandates a tow bar on every second vehicle. In the Gulf, one artillery battery lost a tube early, towed it throughout the operation. It fired every mission. An adjacent unit with a like problem destroyed the gun “to prevent capture.” Stupid. Our Army won’t have this right until the capability’s provided and the habit is burned into every outfit. We also have to figure out who’ll do triage, perform last rites, wash body parts from hulls, reform, rearm, and lead renewed units back to battle. Unpleasant.

**Superiority.** *Employ all available joint/combined arms forces, drivers, and multipliers, particularly Maneuver, Surprise and Initiative, as an integrated whole to attain a winning qualitative advantage over the enemy, a quantitative one when necessary or advantageous.* We must become maneuver, not firepower addicts. Fully integrated combined arms smartly employed in decisive maneuver create effects disproportionate to their numbers. The best results are had when enemy capabilities critical to his physical, conceptual or psychological success are selectively killed, neutralized, or immobilized — fast — in a priority that creates economy. Concurrent rapid, violent, deep envelopments disintegrate or destroy the rest, and on own initiative roll into exploitation nonstop. Force ratios, correlation of forces, and decision lines are the absolute deterministic enemies of good operations in any but exceptional, tightly orchestrated cases like crossing the Atlantic (or the Alps).

## MULTIPLIERS

Multipliers create combat power exponentially greater than the resources committed. They must be rigidly disciplined and adhered to almost unexceptionally. Commanders deviate at their discretion, but only after carefully weighing risks of doing so against opportunity, and concluding that probability of success outweighs risks and that coherence of the overall operation will be kept. Other factors the commander considers vital to success may be added, but not many. There are two times in a soldier’s life when he should lie and cheat — to gain surprise and to protect his force using every deception the outfit’s capable of.

**Maneuver.** *Dynamically employ superior, fast-moving joint/combined arms forces to gain a time/space/place advantage over an enemy, disintegrate his operations, destroy his forces or seize an objective as stated or implied by the mission.* Maneuver’s purpose is to gain a positional leverage which creates decisively superior force at a time and place of your choosing, winning that fight and flowing into exploitation fast. It’s ubiquitous, casting its shadow over all combat (and political) operations. It is the major reason for the existence of Drivers and Multipliers and establishes their relative value in each operation. Surprise is normally an essential part.

Maneuver’s a strolling window shopper in our Army — cautious, shallow, pleasantly indecisive. Simple mob tactics relying on mass and throw weights to make right are more the rule. Post-WWII, Armor and Cavalry lost their way in Korea, Europe’s Cold War neo-trench warfare, and the jungles of Vietnam. Infantry still view any mobility means other than shanks’ mare and parachutes as just trucks — helitrucks, armored trucks, and wheeled trucks — useful for movement, but not related to real maneuver. Artillery’s flirtation with mobility and maneuver in the Gulf may be diluted, and “fire-base-itis” revived by long-range, precision munitions whose success is more video-apparent than real. Beyond that, we’re historically fixated on the big shows, rather than gut lessons for our future. The Civil War, blitzkrieg, and the Patton dramas, among others, have blinded us to many maneuver lessons of American and

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other arms. This “Gettysburg-itis” leaves the Khan, Subutai, Grierson, Crook, Moseby, Forrest, the British Long Range Desert Group, Merrill, Inchon, the battles of the German Eastern Front, and others largely unstudied despite messages that often transcend those of Overlord and the Bulge. We’ve lost the maneuver message.

Maneuver of joint/combined arms demands men and women steeped in history, command, and field operations since their oath, and brutal, career-affecting realism in our training and readiness centers. It needs corporate emphasis, in-depth historical and experiential grasp, mentoring, the ability to thrust trust to the lowest level (power down), accept some disorder, take some risks. Planning for and execution of modern battle and maneuver are too important to be left in the hands of operational gadflies, pedants, or mere theoreticians. Commanders who are unwilling to put their futures in the hands of squad leader, O3s, O5s, and O6s, whom they were responsible to mentor, opt for safety rather than making bold strokes. Stochastic, man-in-the-loop simulations give us an unprecedented opportunity in this respect, but back-spacing is no substitute for being smart enough to do things right. Some points:

- Risk is part of life and maneuver. Learn to exploit it, not run from it.
- Fire and airpower alone seize and retain or physically control nothing.
- EMA notwithstanding, fire supports maneuver, not the reverse.
- Successful maneuver demands a high degree of subordinate initiative, operations decentralized to the lowest *competent* level, and few restrictions. Unwillingness or inability to decentralize shows subordinate resources are too low, mentoring failed, or you distrust your own products.
- Threat gaps or discontinuities must be sought continuously, exploited instantly.
- Envelopments must be decisively deep and exploited fast. Double envelopment’s an art form to be mastered, team through fielded army.
- Flank attacks are generally useful only to small units. Higher, they’re indecisively shallow.
- Delay must be a “defend” nature of resistance, including violent local counterattacks, not fire and fall back. Corps should practice having divisions do it so cavalry can get back to cavalry business.
- Ambush psychology (sneak, hide, deceive, pounce) and forms are elemental to smart maneuvers. It leverages force, simplifies orders, forms mental pictures easily, has intent wordlessly embedded.
- Winning’s your sole criterion, not process or press (media).

**Simplicity.** Make Simplicity permeate everything the command does — concepts, plans, orders language, and actions. Simplicity is our Army’s longest term deserter, not a simple AWOL. As a multiplier, Simplicity counters Clausewitz’ fog and friction of war. With Focus and freedom of Maneuver, Simplicity hatches Initiative in subordinates! It’s heavily reliant on the Army, its institutions, and commands mentoring and leading by example. A common operational framework and concepts, single or few-word mission language, an ambush psychology, and ruthless elimination of toney vocabularies and cool jargon would help. Ambitious people capture the “essence”

(smell) of “expert” language, then rush to inflict the same junk on seniors and subordinates for effect when simple words would do. Troopers who roll their eyes up and slump in their seats are sending them a message, Over.

Give plans and orders that see operations in as great a depth in time and space as you can foresee to assure understanding, delegate freedom of action, gain and retain momentum. After their planned start, operations generally become improv (as in music), so *use the minimum number and least restrictive control measures possible to reduce change conflicts, retain flexibility, and promote sub-leader initiative.* Excessive detail in orders erodes confidence and morale by conveying distrust. Control measure-induced “slowness” often kills more of our men/things than direct hostile action. “Intent” paragraphs, *perhaps* needed at corps and division, should be infrequent at brigade, superfluous below that, except in extraordinarily complex or subtle operations.

In all but rare cases, written intent from brigade down is *prima facie* evidence that the Army’s institutions, its officer corps and NCO corps, haven’t gotten their conceptual and mentoring acts together or are personally insecure. Intent that is understood and acted upon by all hands consistently over time comes from force-wide shared operational concepts, *effective* education, officer and NCO mentoring by capable seniors, trust-based training, simple mission orders and pictures in the sand, on butcher paper, in person, or via teleconference. Examples from the Gulf War are atrocities that seem written for “I ordered ’em to” defenses against the press or a special prosecutor rather than operations. Some mission orders start at stand-to, finish at lunch. Two-minute FRAGOs draw fire and EW. Most of the FRAGOs sent in to this magazine as solutions to tactical vignettes deserve burning because of length, complexity, and telling folks what the commander should have already taught them. In sum, simplicity must be branded on the minds of the Army’s body politic, then be bodyguarded by draconian discipline to restore it to our concepts and the words and pictures used to express them. It’s professionally embarrassing that Tom Clancy’s *Into the Storm* captured the essence of Army doctrine better in fewer, simpler words than our doctrine writers.

**Surprise.** Hit the enemy with fire, maneuver, or both in times, places, weather, or ways he least expects and for which he’s physically or mentally unready. Create virtual unreality in your opponent’s head. Make him disbelieve his ability to execute his doctrine, or beat you *mano-a-mano*, or as an outfit. Use deception, Speed, Initiative, Maneuver to gain Surprise. Strike at unexpected times and places with unexpected tactics, speed, violence, or strength. Create and sustain an ambush mindset in subordinates. Use ambush forms in defense, adapt them to offense. They convey mission, concept, intent and coordination in FRAGOs fast, simply, completely. Avoid predictable patterns in feeding, fueling, arming, and fixing. Exploit enemy habits. Fatigue can be your ally or enemy, so sustain a tempo and pressure that tires him without collapsing you or your soldiers. Reverse cycle operations work well mixed with others. Until all threats equal our night vision and acquisition systems, smoke is a valued ally.

**Protection.** Never allow the enemy to understand your intent, concept, or method(s) of operation, scheme of maneuver, to strike you or gain an unexpected advantage in time, place, position, or means. OPSEC deserves bastardly enforcement, as well as leadership by persuasion and example. Use organic cavalry mostly for intelligence, reconnaissance, and targeting. Push your cavalry out to the limits of comms and supporting fires. Deceive

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or destroy direct or clandestine observation, and overhead platforms. Prevent standoff attacks by fire, infiltration or terrorist penetration. Protect forces from acquisition or engagement by enemy ground, air, and missile forces. Destroy enemy intelligence collectors, in a priority, with any means available. Use surveillance, OPSEC, outside resources, overheads. Decoy with visuals and reduce or multiply RF and heat emitters so all headquarters and their decoys look alike.

**See the Enemy (ENINFO).** Analyze current enemy strengths, operations, forms, and patterns, getting critical enemy info to the echelon most effected NOW. (Readers are warned that these comments are biased by having received only two useful intel reports in a career, but rooms full of failures.) Recommend/decide *based only on enemy capabilities and probable courses of action, never try to guess his intent.* Western rationalities are uncharacteristic of many likely opponents. Some individuals and their forces exhibit unexpected patterns, behaviors or capabilities.

Don't confuse data with intelligence. Until data is sifted, analyzed and compressed into decision-critical probabilistic information, it's ration-heating trash. It must contribute directly to Speed, violence, and integration of joint/combined arms at the mission level.

To read capability/probability, put collection assets at the echelon that needs them. Use ethnic minorities for SIGINT despite clearance rules, or timeliness is lost. Nuke black boxes/ green doors. At corps or lower, purge people and systems that brought national and theater intel arrogances with them. Fight to get and create your own HUMINT. It's potentially your greatest strength, but still our system's biggest weakness. Finally, remember that overactive situational awareness glands are human, exist everywhere, may fog Focus, situations or destroy wanted outcomes. They can become fear/rumor machines, prompting wrong reactions by men, leaders, and units. Corrupt filtering of situational awareness information to produce "desired results" is a sad systemic and dangerous potential.

## ARMOR'S NEW HEADING

As complex as blending Principles with operational concepts may seem, it pales compared with what's needed to assertively project Armor into the future. Potential battlefields (spaces) and OSW defy prediction as to time, place, and their military and human contexts, including religion and ethnicity. Even our own nation isn't immune from concerns of social or terrorist-stimulated unrest or destruction. The assertion that any projected future battlespace will be reliably saturated by acquisition, targeting, and delivery means is a grotesquely huge assumption that rests on bum joints and shaky legs. Mother nature's mischiefs, terrain, rapidly evolving countermeasures, mobility, orbital periodicities, other service priorities, physical fragility, human error, our inability to produce systems that meet advertisements, budgets, and probability are among limiting factors.

The battlespace of the foreseeable future will remain discontinuous — a big, porous Swiss cheese full of moving "black holes" often free of technological intelligence, HUMINT sources, or fires. Without hunter-killer air teams and mobile, lethal ground maneuver elements those "Black Holes" containing armed, operationally effective enemy will be undetected, uncountered threats. In the Gulf, HUMINT-free depth was a strategic and operational flaw that hurt estimates, decisions, and outcomes. Lack of HUMINT and bureaucracy killed in Mogadishu. Desert Fox (DF) air operations *against stationary targets*

put an exclamation point behind this estimate, written weeks before DF was executed and its BDA in. DF showed again that after 30+ years of effort and hundreds of billions in expenditures by all services, "near-real time," "perfect knowledge," "precision delivery," "destruction," a PK of 1.0 and control of battlespace without ground forces still escape us. Precision weapons and air power alone can't win wars. When airmen and precision artillerists assert their omnipotence to you, cheerily ask, "*Have you killed a SCUD today?*"

Future operational fluidity, realistic targeting/shooting system probabilities, and holey battlespace mandate mobile, lethal forces far forward. The holes are the future Armor force's natural battleground and present Armor with both its greatest challenge and opportunity — **IF** we create a concept and move dynamically and resolutely to grab the brass ring. Manned recon and very deep (40-400km) ground maneuver forces to gather HUMINT, target, destroy forces, and seize objectives seem essential complements to remote systems. Mobile commands of extraordinary speed, operational radius, lethality and remote sustainability will be necessary to operate in time-distance harmony with AWACS/JSTARS and deep precision Naval and USAF Air Expeditionary Force fires. Armor's roles in limiting terrain, "constabulary" operations, and nation-building must be established, not waived. In all cases, Armor's future leaders must be marked by their "state of mind" excellence, winning experience, and performance in operations and command more than by their 8x10 glossies and gold-plated, multi-track ORBs.

These future-oriented notions emerge:

- **Armor must make time/space our strategic and operational allies, not adversaries. We must equip and size to fit the lift we've got, get to/perform any mission anywhere and be operationally complementary, budget and strategic-mobility competitive with sea and air power or we lose.**
- **The Armor team must develop a dynamic future-oriented combined arms concept and the expertise needed to force it through Army and interdepartmental developmental and budgetary processes.**
- **Armor forces and leaders for foreign and domestic contingencies must be historically many-dimensioned, experienced operators, not mere multi-track Process Prinzen or regimental retreats.**
- **We need to move out 40 years ago.**

Future victors **won't** be thick-lensed nerds, heads-down in their turrets or welded to work stations and large screen displays in search of checklisted, matrixed, summed and scored deterministic answers.

They **will be** bold, confident, tough, smart SOBs who lead in front, think fast in the heat of combat, are comfortable in uncertainty, weigh probabilities and risks, make apparent order from obvious chaos and **WIN**.

## GOOD HUNTING!

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BG Kirk served 24 of 27 years "happily undiversified" in command, operations and training. Seven consecutive years of grime time as 1 AD G3, Bde Cdr, C/S and 5 Mech ADC(M) preceded terminal posting as Director of Training, ODCSOPS, DA. He retired in 1983. For terse replies on this or other stuff, fire flak at: [KIRK.celtzen@wolfenet.com](mailto:KIRK.celtzen@wolfenet.com) starting 17 Mar '99.



# Life After Operational Maneuver

(a 12-step program)

by Cadet Joseph Berg and  
Captain Robert Bateman

## History and Heresy

In the 82 years since the invention of a practical tank, the sum of its use in a conventional situation consisted of two years in the First World War, seven in the second, and probably four additional years in places such as India, Korea, and various Middle East locales. This is a refrain familiar to the armored community. Yet what is rarely pointed out in counter-arguments are the accounts of when and how armor was used in ways planners did not anticipate.

The service of armored vehicles in the remaining 69 years includes an almost unbroken string of engagements in low intensity conflicts or employment in unconventional roles, beginning with the British in Palestine and continuing through the American involvement in Somalia. Combatants in these situations almost invariably lacked a thorough intellectual foundation for conducting an unconventional war. The majority of commanders sought to employ conventional doctrine on armored operations, but combat experience often produced an improvised doctrine separate from established thought. Because of their improvised and local nature, these decision-making guides rarely found their way into broad circulation among conventionally-minded armies.

Reading accounts of participants in armored, unconventional battles reveals similar local operating procedures which soldiers innovated to cope with unexpected situations. To avoid falling into this pitfall of unpreparedness, the United States Armored Force must plan changes in organization, equipment, and doctrine which address the dichotomy between the wars we are planning for and the wars we are likely to get. Specifically, the Army should consider a force structure that assigns tanks and armored vehicles directly to the light infantry in a supporting role across the Army. The concepts behind this historically-based recommendation ought to influence all future force structure modifications, such as the creation of the Strike Force. This recommendation would likely be most effective if accomplished at the brigade level (for the infantry), perhaps with an armor company assigned to each light infantry brigade.

## The Road Behind Us

The tank was born of the need to provide mobility, firepower, and protection on the battlefield. Initially this mission was viewed entirely through the lens of infantry support. During the years between WWI and WWII, this vision changed, as tanks began to assume the cavalry role. Based upon experience in World War II, most armies viewed armored vehicles as a means to restore operational maneuver to the conventional battlefield. As a result, tactical and operational mobility became the most



important attribute of armored vehicle design. Since many unconventional conflicts occurred in restricted terrain that limited the mobility of mechanized forces, military thinkers often dismissed armored vehicles as irrelevant to that type of warfare. But the historical record shows that tanks and tank-like vehicles were often used in these roles, and their employment often took on a form greatly changed from the conventional practice.

Current discussions of tank operations show a particular trend which developed after World War I, but the intellectual consensus on the role of tanks in warfare was the original motivation for their creation — infantry escort and support. Richard M. Ogorkiewicz's *Armor: A History of Mechanized Forces* describes them as, "barbed wire crushers and machine-gun destroyers.... a useful auxiliary."<sup>1</sup> This role as conventional infantry support continued throughout the inter-war period. The British publication *Tank and Armoured Car Training* of 1927 describes the tank as "especially suitable for facilitating, by fire action, the forward movement of other arms."<sup>2</sup> Simultaneously, a new, and eventually dominant, viewpoint emerged. Armies began to think of employing tanks in the old cavalry role, "reconnaissance, screening, exploitation, pursuit, and raiding operations... [necessitating] a more dynamic use of the tank than the simple close support role."<sup>3</sup>

Although methods and tactics varied greatly, to large degree most participants in World War II began with armored doctrine that reflected this divergence of mission between the infantry and cavalry branches.<sup>4</sup> The French offer, perhaps, the most studied lesson in armored tactics. Despite their early development of armor during the First World War, they did not follow the same design or doctrinal path as did the Soviets, British, or Germans between the wars. From the outset, the majority of French tanks were designed solely for infantry support.

This philosophy affected the design of French tanks. The French developed some of the heaviest tanks ever seen. The Char 2-C heavy tank weighed in excess of 70 tons with a crew

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of between 13-19 personnel. For firepower, one experimental model mounted a 155mm main gun.<sup>5</sup> Such huge tanks could travel only 3-6 miles per hour, a sufficient speed to accompany infantry moving at an absolute top speed of five miles per hour, but inadequate for rapid offensive warfare. Additionally, French tank designs developed in the interwar years often had a one-man turret. Even their most successful designs, the Char B-1 heavy tank and the Char Somua S-35, with three- and four-man crews, retained this single-man, cast-iron turret design.

The result of this doctrine and training was tanks with good armor, decent automotive power and sufficient weaponry, but tanks unsuited to the tempo of mobile warfare.<sup>6</sup> In simple terms, a tank with a one-man turret is at a severe tactical disadvantage against a tank with a two-man turret. The extensive study and myth-making which surrounded the subsequent French defeat led many members of the armor community to conclude that mobility and not protection was the dominant trait needed in an armored vehicle. Indeed, armies who trained to conduct infantry support were doomed to defeat from the outset. By the war's end, a loose consensus emerged on the employment of armor which holds even in the present day. Generals should employ tanks, in mass, on the operational level to exploit weaknesses in the enemy's initial positions and rear areas. Works by B.H. Liddell Hart, Heinz Guderian, and various Soviet theorists all pointed in this direction, even if they disagreed on methods.<sup>7</sup> The current-day western military thought on the topic of armored force employment is stated nowhere more clearly than in civilian military analyst James Dunnigan's 1993 edition of *How to Make War*. According to Dunnigan, "The concentrated combat power of tanks makes them alone of all the combat arms, capable of forcing a decision quickly and decisively."<sup>8</sup>

Yet in the aftermath of World War II there was a long series of wars which saw armor employed around the globe, often in violation of this consensus. For all intents and purposes, neither the French, Israelis, British, nor the Soviets possessed a premeditated theory for employing armor in a limited war against an unconventional foe prior to their respective interventions in Indochina, Lebanon, Northern Ireland, or Afghanistan. Examining the experiences of these other nations, as well as our own historic record, will validate this basic premise.

As seen earlier, during the years between World War I and II, the British Army began following two paths in developing their designs for new armored vehicles, one of traditional infantry support, but also a newer role of fulfilling the cavalry mission. But they remained wedded to the idea that tanks were for use solely in conventional warfare scenarios. Limited British experience in policing areas such as the Palestinian Mandate with armored cars was eclipsed by the campaign experience of the Second World War.

As a result, the British did not foresee the potential of tanks in policing the rebellious provinces of Northern Ireland. Yet when faced with increased violence in the province during the 1970s, the British did eventually deploy armored vehicles there. Although tracks proved less than ideal for the narrow Irish streets, Michael Dewar's *The British Army in Northern Ireland* contains descriptions of at least four different types of armored vehicle that served with the British troops there up to 1985. These vehicles ranged from armored Land Rovers to Saladin armored cars.<sup>9</sup> Missions for units with armored vehicles included securing roadways and close support of dismounted patrols. The first-person account, *Contact*, emphasizes the role "pigs" (nickname for the standard APC) played in force protection.<sup>10</sup> As in other

cases, doctrine was developed on the spot to meet local conditions.

In Afghanistan, Soviet forces chose to employ tanks and other fighting vehicles from the very start. "Armor in Low Intensity Conflict," a study published at the U.S. Army's Command and General Staff College, concludes that the Soviet forces viewed the counter-insurgency campaign in that country as merely an extension of their conventional mountain warfare doctrine, which included heavy armor.<sup>11</sup> After indifferent results or outright defeats resulted from attempts to employ armored units in maneuver warfare against the Afghani guerrillas, the Soviets began to reorganize their forces locally. *The Bear Went Over the Mountain*, a translation of Soviet staff studies of the Afghan War, reflects the increasing dispersion of Red Army armored units to support outposts and convoys. Additionally, the Soviets began to organize special groupings of armored vehicles to provide close support to advancing infantry.<sup>12</sup> *Armor of the Afghanistan War* points out that Soviet airborne troops rapidly exchanged their light BMD personnel carriers for more durable BMPs.<sup>13</sup> What emerged from the Soviet experience there, at least in theory, was an appreciation by the Red Army that operations in restricted terrain, which rely primarily upon the infantry for execution, require a re-thinking of the concept of the purpose of the armored vehicle.<sup>14</sup>

In similar fashion, the Israeli involvement in a prolonged unconventional war in Lebanon began as a conventional operation and is well documented as such in *Operation Peace for Galilee* by Richard Gabriel.<sup>15</sup> After the Israeli Defense Force crushed organized conventional resistance, the war entered a prolonged period of unconventional attrition warfare. Lieutenant Colonel David Eshel's article in *ARMOR* is particularly useful in assessing the changes wrought on the Israeli armored force by unconventional opponents.<sup>16</sup> Tanks were deployed in "a series of strongpoints located widely apart," as well as "maintain [-ing] open supply routes to the strongpoints."<sup>17</sup> The article goes on to detail a staggering array of upgrades to armored vehicles to make them less vulnerable to guided missile ambushes, a weakness enhanced by Lebanon's rugged terrain. Again and again, the historic record displays the same tendency to use armored vehicles in defensive and supporting roles.

During French combat operations in Indochina, terrain and the nature of the combat dictated that armored forces would not operate in large formations against conventional forces similarly equipped. Instead, as was so well illustrated by the fate of the now famous *Groupment Mobile 100*,<sup>18</sup> they were to operate as fire brigades at best, rushing from location to location where they would be employed in infantry support operations. At worst, they would serve as near-static defenses in strongpoints across the landscape in contention. Yet the French, due to the lessons learned from World War II, remained wedded to the idea that armored forces must be utilized in highly mobile reaction forces. Having abandoned the idea of armor designed for infantry support, they were extremely loath to return to that intellectual terrain. As a result, light American supplied M-24s, half-tracks, and 2-1/2-ton trucks proved highly vulnerable to Vietnamese mines and RPGs because they were designed as scouting and transport vehicles and not stand up firepower.

All of this leads us to an examination of the American military experience. Here the record is relatively clear. Following World War I, the Tank Corps was disbanded, and tanks were subordinated to the infantry. Tanks were, officially at least, solely for the support of the infantry. Beginning in the late 1920s, ideas started to circulate that perhaps there was a potential for mobile

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warfare in the budding technology as well. For the sake of argument, let us refer to this period as “the bad old days.”

Following the 1940 creation of the Armored Force, and its successor, the Armor branch, the Army followed the path of so many other nations. Armor was designed for and conceptually assigned the mission of mobile warfare in conventional warfare.<sup>19</sup> Planners focused solely upon tank-heavy or tank-pure operations at the tactical and operational levels. This despite the fact that during the war itself the actual majority of all tank battalions that saw combat were not members of the 16 armored divisions but separate battalions operating in a habitual direct support role to the infantry divisions.<sup>20</sup>

Thus, the American armored experience should appear this way:

- In World War I, tanks supported infantry only.
- In World War II, most tanks supported infantry.
- In Korea, American tanks came in very little contact with opposing armor — almost all tank combat operations were in support of the infantry.

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*Our Army’s deployment to Somalia once again highlighted the vulnerability of light and even lightly armored vehicles to mines and light anti-armor weapons. Simultaneously it demonstrated the need for armored forces in direct support of the infantry.*

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In Vietnam all tanks supported the infantry. American armored troops found their biggest threat to be the anti-tank mine and the light anti-armor rocket. The variety of ammunition available to the M-48’s 90mm gun proved to be a valuable asset in security and support missions remarkably similar to those performed nearly a decade later in Afghanistan. Despite this, by the time of American involvement in Vietnam, the Army was fully committed to the use of armor in primarily a tank-versus-tank role. General Donn A. Starry emphasized that Bernard Fall’s description of the fate of French mobile forces in *Street Without Joy* carried great influence in American circles.<sup>21</sup> In addition, he noted that the U.S. Army enjoyed “a singular lack of doctrine for mounted combat in areas other than Europe and the deserts of Africa.”<sup>22</sup> In many ways, despite the publication of local training circulars, it was not until the 1982 *Jungle Operations* manual that a comprehensive set of instructions for armored combat in restricted terrain appeared for Army-wide consumption.<sup>23</sup>

A host of current military operations demonstrate the need to rethink our concepts of how armor should be organized and doctrinally employed. The American deployment to Panama in Operation Just Cause included an armor unit integral to the 82nd Airborne (3-73 AR). However, anticipated resistance dictated that planners add additional mechanized units in an ad-hoc manner from the 4th Infantry Division. Both the M551s and M113s utilized in the operation were needed in support of light infantry units in operations in urban terrain.

Our Army’s deployment to Somalia once again highlighted the vulnerability of light and even lightly armored vehicles to mines and light anti-armor weapons. Simultaneously it demonstrated the need for armored forces in direct support of the infantry. The improvised nature of the logistic arrangements provided for the Abrams upon its arrival in theater was less than optimal.

Deployment to Haiti again featured hastily attached armored units (Bradley Fighting Vehicles) to the entry force, and although the IFOR deployment into Bosnia recognized the necessity of armored force in a support and stability operations mission, few of the crews there performed in a role for which most of their military training prepared them. Reflective of the missions which occurred in the past, the Bosnia deployment featured tanks and fighting vehicles deployed piecemeal in support of strongpoints, performing route security, and, should conflict have arisen, direct support of an infantry-dominated operation.

### The Road Ahead

Of course, the Armor Force must be trained and prepared to fight and win a conventional conflict characterized by large scale operational maneuver. The authors are not advocating a return to the “bad old days” of infantry dominance of the armored force. Yet, the tactics and missions performed by armored units in areas other than the high intensity battlefield, often in restricted terrain, are fundamentally different, beyond mere revalidation of the importance of some missions such as Military Operations on Urban Terrain (MOUT). In an environment of long-duration occupation and relatively predictable operational patterns and tempos, high mobility simply means that the task force reaches the ambush site quicker. Instead, our focal points must become protection against mines and light, easy to acquire anti-tank weapons. That protection is most likely to come from walking infantrymen on the ground.

Tank crews must be trained, equipped, and organized to support operations restricted to the pace of the walking infantryman. Fortunately, the Armored Force is not hampered by the technological hurdles of the 1920s and 1930s. What we are lacking is a true linkage to what will in all probability be the real future: combined arms at the worm’s-eye level. To illustrate how far we have diverged from this mission, look no further than a few of the design flaws of the M1 family of vehicles, as seen from an infantryman’s perspective. The Abrams is both mobile and very well protected. Excellent for those of us inside the hull or turret, but it comes at a cost. No infantryman in his right mind is going to provide close dismounted escort to an M1 in a MOUT environment from the traditionally most effective location, directly behind the tank, for obvious thermal reasons. Nor are stopgap communications measures, such as hanging TA-1 and field phones off the side of the tank, a truly reliable replacement for the old “escort phone” that was once included on U.S. tanks. Another lesson handed down by past combat tankers was that having a wide variety of munitions available for the main gun proved beneficial. Yet we no longer have the WP, canister, or smoke shells of the past, three munitions crucial in close fighting with the infantry.

Simply put, our current tank reflects better than anything else how far we have diverged from any idea that we might again have to work with the infantry in close quarters. Work at the new Fort Knox MOUT site may well highlight these limitations and lend current validity to our historically based recommendations. Yet, there is a need for larger change in the organizational structure as well. Among other things, we must acknowledge

that infantry support does require specialized knowledge and training not developed on TT VIII. What we need is tankers who are well trained to support the infantry. The permanent attachment of a tank company directly to each light infantry brigade would standardize logistic arrangements and command procedures, greatly enhance the firepower of the brigade, and provide a critical force protection asset.

United States Army armored force doctrine and organization does not entirely reflect how our forces were actually employed over the course of the past 50 years. America's enemies identify casualties as a key center of gravity for our forces. Heavy armor provides the infantry with protection they need. As the French used to remind their troops in Vietnam, "Remember, the enemy is *not* fighting this war as per French Army regulations."<sup>24</sup>

## Notes

<sup>1</sup>Richard M. Ogorkiewicz, *Armor: A History of Mechanized Forces* (New York: Praeger, 1960), 8.

<sup>2</sup>War Office, Great Britain, *Tank and Armoured Car Training* (London: H.M. Stationery Office, 1927), 16.

<sup>3</sup>Robert S. Cameron, "Armor Combat Development 1917-1945," *ARMOR* (September-October 1997), 14.

<sup>4</sup>All of the following feature some discussion of this debate over the role of armor: Cameron, 14-19; Robert H. Larson, *The British Army and the Theory of Armored Warfare, 1918-1940* (Newark: University of Delaware Press, 1984); Ogorkiewicz; A.J. Smithers, *A New Excaliber: The Development of the Tank 1909-1939* (London: Leo Cooper, 1986); Harold R. Winton, *To Change an Army* (Lawrence, KS: University Press of Kansas, 1988).

<sup>5</sup>Major John W. Leonard, "The Development of Tanks," *Infantry Journal* 27, No. 5 (1925), 486. This article was a survey of then current armor developments around the world. The model which Leonard identifies as having a 155mm gun mounted was the Char 2C-bis, of which only one was made. Additional information regarding French interwar armor is found in Mildred Gillie, *Forging the Thunderbolt: A History of the Development of Armor* (Harrisburg, PA: The Military Service Publishing Co., 1947), 19. Gillie also states that there was one French tank weighing 144 tons. The nomenclature of this tank is not recorded. The only substantiation to this claim I have found is a small note in the "Technical Services" portion of the *Infantry Journal* circa 1930 which makes the same claim.

<sup>6</sup>Christopher Foss, *Tanks and Fighting Vehicles*, (London: Salamander Books, 1977), 79. Foss makes this point repeatedly in a technical analysis of numerous French armored vehicles of the pre-war period. As a regular contributor to Jane's Defense series books, this analysis is probably based less on historical documentation than on modern ergonomic designs which Foss encounters in his work in modern armored vehicle analysis. However, his point would appear to be validated by both common sense and the empirical data collected by modern U.S. Army automated armored vehicle crew training such as the UCOFT as observed by the author. (Unit Conduct Of Fire Trainer) In UCOFT engagements, the crews of modern U.S. vehicles are forced to undergo simulated "degraded operations" and "commander only" engagements. The target kill/target presented ratio for these types of engagements are generally much lower than the kill ratio of the full crew even though the commander has a fully operational station to engage targets.

<sup>7</sup>B.H.Liddell Hart, *The Future of Infantry* (Harrisburg: Military Service Publishing Co., 1936). Heinz Guderian, *Panzer Leader* Trans. by Constantine Fitzgibbon, (New York: Dutton, 1952). John Milsom, *Russian Tanks, 1900-1970: The Complete Illustrated History of Soviet Armoured Theory and Design* (Harrisburg: Stackpole Books, 1970).

<sup>8</sup>James F. Dunnigan, *How to Make War* (New York: William Morrow and Co., 1993), 70.

<sup>9</sup>Michael Dewar, *The British Army in Northern Ireland* (London: Arms and Armour Press, 1985), 196-200.

<sup>10</sup>A.F.N. Clarke, *Contact* (New York, Schocken Books, 1984), 45-71.

<sup>11</sup>Michael R. Matheny, "Armor in Low Intensity Conflict: What is the Best Doctrine for Counterinsurgency?" School of Advanced Military Studies (Fort Belvoir: Defense Technical Information Center, 1987), 23-26.

<sup>12</sup>Lester Grau, ed. *The Bear Went Over the Mountain: Soviet Combat Tactics in Afghanistan* (Portland: Frank Cass, 1998).

<sup>13</sup>Steven Zaloga, Wojciech Luczak, and Barry Beldam, *Armor of the Afghanistan War* (Hong Kong: Concord Publications, 1992), 9-12.

<sup>14</sup>"At least in theory" because, as evidenced by Russian operations in the breakaway province of Chechnya, the Russians may have forgotten this lesson in the intervening years.

<sup>15</sup>Richard A. Gabriel, *Operation Peace for Galilee* (New York: Hill and Wang, 1984).

<sup>16</sup>David Eshel, "Armored Anti-Guerrilla Combat in South Lebanon." *ARMOR* (July-August 1997), 26-29.

<sup>17</sup>*Ibid.*, 26.

<sup>18</sup>Bernard B. Fall, *Street Without Joy* (Harrisburg: Stackpole Books, 1961), 185-250. General Westmoreland notes in his memoirs that he kept a copy of this book on his bedstand at night. G.M. 100 was a combined arms task force decimated in the Central Highlands of Vietnam. Interestingly enough, in his revisions, Fall suggests that the performance of the armor platoon was perhaps the most effective unit employed (p. 356).

<sup>19</sup>There was one minor exception to this modern consensus, the United States Marines maintained an armored force whose purpose resided solely in the province of a supporting arm. *Progress and Purpose*, a Marine Corps developmental history, attributes this tendency to the difficulty in landing large numbers of tanks in amphibious operations. Discussion of the role armored forces should play in any unconventional situation was largely non-existent. The U.S. Marine Corps made a small attempt in their *Small Wars Manual* of 1940. The extent of this commentary was merely to state that armored vehicles might have a significant psychological value against an insurgent and reduce casualties in the initial stage of an intervention.

<sup>20</sup>Ultimately only around 20% of the tank rounds fired in combat were of the armor-piercing variety and even the single-purpose tracked tank destroyers found use mainly as assault guns.

<sup>21</sup>Donn A. Starry, *Mounted Combat in Vietnam*. (Washington: U.S. Government Printing Office, 1989), 4-5.

<sup>22</sup>*Ibid.*, 7.

<sup>23</sup>United States Department of the Army *FM 90-5: Jungle Operations* (Washington: U.S. Government Printing Office, 1982), chap. 6, 5-14.

<sup>24</sup>Fall, 381.

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# Tips for Tankers

## *or Lessons Learned and Re-learned*

by Colonel Christopher V. Cardine (Retired)

The M1 series of tanks have been in the field for 18 years. However, many soldiers and leaders continue to make the same simple mistakes when using and maintaining these vehicles. This is despite many material changes in the vehicles' design and continuous changes in our training programs. Hopefully this article will give tankers a quick reference to the most common problems and their cures.

Since the very first XM1 tanks were sent to operational testing at Ft. Bliss, the Project Manager Abrams and the prime contractor, General Dynamics (originally Chrysler), have been recording and responding to problems seen in the field. This program is called the Abrams Field Problem Management system, and is funded as part of an engineering services contract.

Every time a tech rep comes to visit you to help solve a new problem, or whenever you send an Equipment Improvement Report into TACOM, the data is recorded as a unique field incident report. All accident reports are also entered into the data base. These incidents are continuously evaluated for trends that may require equipment changes through modification work orders (MWO), safety of use messages (SOUM), maintenance advisory messages (MAM), changes to technical manuals (TMs), and/or changes in the programs of instruction (POI) at the TRADOC schools.

There is a very regimented review process in place, the Field Problem Review Board (FPRB), and a separate but related System Safety Working Group (SSWG). The FPRB evaluates problems and makes a determination of what actions are necessary. The SSWG addresses and resolves Abrams safety issues. Members of these boards include the user representatives from the TRADOC Systems Manager's (TSM) Office for tanks at Ft. Knox and Aberdeen Proving Ground, the Army Safety Center, TACOM, the contractors, and the logistics and system engineers from the Project Manager's Office. Either the Project Manager Abrams or one of his two Product Managers (PM-M1A2 or

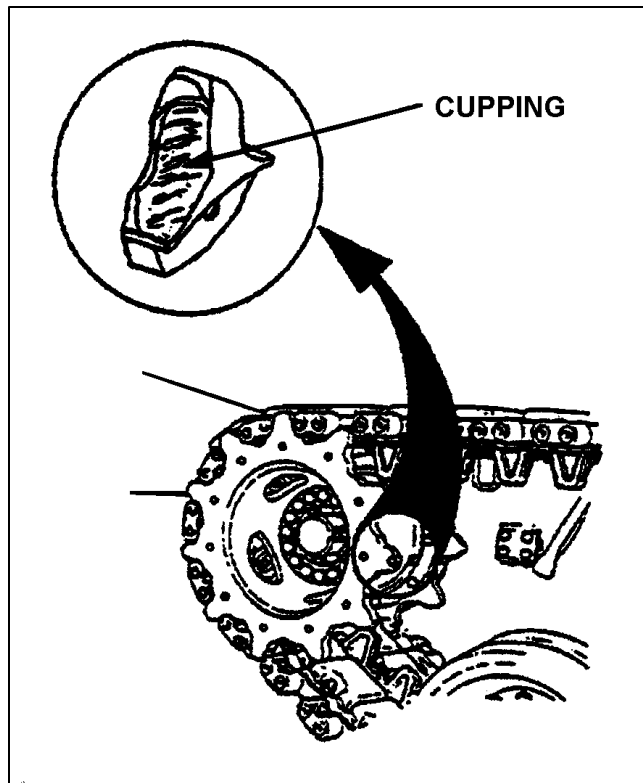


Fig. 1

PM M1/M1A1) personally chair the board.

After the board meets, a complete summary is published of all incidents and what is being done about them. The FPRB books were previously published and mailed to battalion commanders and their maintenance officers, but the costs became prohibitive. The results and other current tank information will soon be available on the Internet on the PM Abrams web site. You may also get copies from either your local GDLS technical representative or TACOM Logistics Assistance Officer (LAO). They are published after every FPRB, about once every two months.

As an original member of the XM1 Test Set Incident Reporting System (the FPRB precursor) while a captain, through battalion command in the field, and finally as PM Abrams the last four years, I saw too

many repeat incident reports! We are not learning from our own mistakes. Even after material changes are made to the equipment and the TMs are updated, soldiers are still making simple, costly maintenance and operational errors. I will try to summarize some of the classics, explain what the symptoms are, and how you as leaders can do something about them.

### HULL/AUTOMOTIVE

#### Sprocket Cupping

Have you ever wandered through the motor pool on an inspection and found a tank that has strangely worn end connectors and sprockets that have cups in their teeth? (See Fig. 1) Is it bad track quality? Improperly hardened sprockets? A bent roadwheel arm? No, it's a crew that thought they followed the track adjusting



procedure, but really did not. The track is actually overtightened. This, despite the fact that the track adjusting link (TAL) has an automatic relief valve to prevent this. How do they do that, you ask? Simple.

If you refer to the technical manual, it tells you before adjusting track to move the tank forward on a level surface and let it coast to a stop without applying the brakes. This is so the TAL will be the only thing pressing against the track while you add grease. When the appropriate tension is there, the grease will come out through a one-way relief valve. (Fig. 2)

If you go down to the motor pool to do maintenance and tell soldiers to adjust track tension, they will do the following: They get their grease guns and pump grease into the TAL until it comes out. Unfortunately, when they parked the tank the night before, they stepped on the brakes and then set the parking brake.

My soldiers never do this, you say. Walk through your motor pool and watch! Also, see how many tanks have cupped sprockets. It is a great maintenance indicator.

### Blown Main Hydraulic Pumps/Fires

Had any instances where mechanics were complaining about poor quality pumps that blew out? Had a mysterious hydraulic oil fire caused by a pump that split a seam? Know what causes this 99 times out of 100?

When a pack is pulled and reinstalled, most mechanics do a good job of tightening the new style main hydraulic lines on the top of the pump. Where they make mistakes is when reconnecting the hydraulic pump case drain (return line) quick disconnect coupling. (See Fig.3) If it is not properly seated and positively locked, the oil flow is off. There is no oil leak because the quick disconnect is self-sealing when improperly installed or disconnected. Unfortunately, there is also no oil flow out of the pump during certain overflow conditions. This can generate sufficient pressure to cause the pump to burst, spraying hot oil in the engine compartment.

What's the cure? Training your mechanics, and a quality check by your maintenance supervisors of the quick disconnects after services. A leader who knows how to reach in and check for a properly seated QD does a lot to ensure that the soldiers do it also. Take your time to learn the feel on this one, as it is tricky.

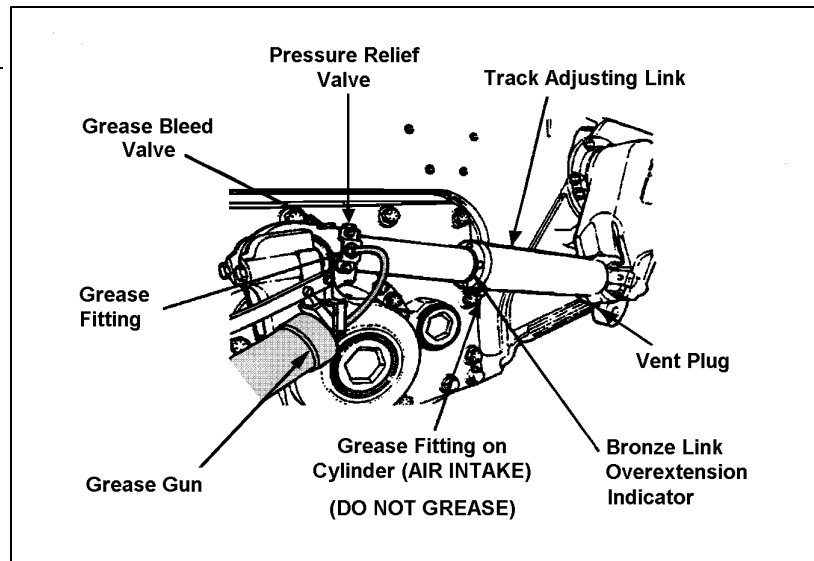


Fig. 2

### Sprockets and Hub Carriers That Shear Their Bolts

Seen this one before? This happens quite frequently about 200 miles after the crew has rotated the sprockets. The cause is usually that they have reused the fastening hardware. The TM calls for replacing bolts when two or more sprocket bolts, or four or more hub bolts, are found loose during normal operations. Left unsaid: if you loosen them all to replace or rotate the item, you have exceeded this criteria and they should all be replaced. Even if you properly re-torque these bolts, they often have been stretched beyond their elastic limit and will again come loose. The result is a tank on the roadside missing training while someone looks for bolts.

The solution here is simple. Each company team PLL clerk or maintenance leader should have one or two sets of sprocket and hub bolts always on hand. When the crew replaces or rotates the sprockets or hubs, they can be given a new set on the spot to get the job done right the first time. If you are a leader and are walking around the motor pool and see a crew changing sprockets or carriers, you should take the old bolts, instructing the crew on why they should only use new.

### Loose End Connectors and Missing Wedge Bolts

These are the bane of every tank crew's existence. With 156 track blocks connected together with two end connectors each, there are 312 wedge bolts to come loose. Even if you are 99% good, there are three loose ones out there! The newer T-158 and T-158LL track have a new crimped wedge that acts as a locking nut to make life better. However, if you do not assemble the track properly in the first place, the wedge bolts will still come loose.

Most crews assemble a set of track by laying out the eight block sections and hooking them together. They then tighten the end connector bolts down with all their might or actually using a torque wrench. Unfortunately, they are doing a

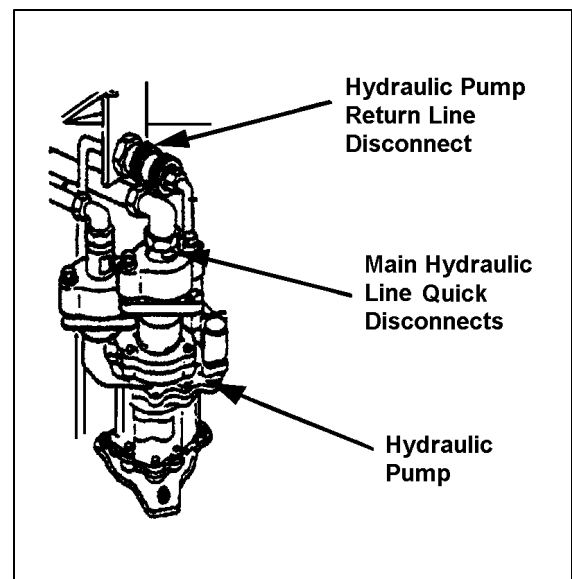


Fig. 3

lot of work for nothing as the wedge bolts will be loose as soon as the track is on the tank. To properly torque the wedge bolts, the two track blocks must be at an angle to one another. If you look at a mounted track as it comes down from the front idler wheel and goes under the #1 roadwheel, it makes the only angle where there is no tension between the wedge bolt and the angled face on the two track pins. Unfortunately, this is the only spot where you can torque the end connector wedge bolts properly.

When you assemble a new track or replace track blocks, paint each of the new end connectors and torque it only at the #1 roadwheel pivot point. This is also true for any loose end connectors you find during inspections. It does no good to “tighten” them unless the two blocks are properly angled. We have run many tracks for thousands of miles after properly torquing the wedge bolts and have rarely had one come loose. The secret is in the location *where* you torque them and not how tightly you screw them down.

### T-158 and T-158LL Track Differences on M1A2s

T-158 track will soon be replaced in the inventory with T-158LL track. Although both types of track are interchangeable and the T-158 costs less, you cannot use it on newer M1A2s. If you use T-158LL track on an M1A1, the vehicle will actually weigh less than its 68.4 ton rating because it was designed with the T-156/T-158 track weights in its budget allocation. This is OK. However, the newer M1A2s have used the T-158LL weight savings by incorporating newer, more effective survivability improvements in the vehicles. To keep the vehicle within its weight of 68.4 tons, you must only use T-158LL track on these vehicles. Both track types (T-158 and T-158LL) have a 2,000-mile life expectancy.

### NBC System

The sponson-mounted NBC system and its filters located in the crew compartment are one of the best and most reliable protective systems in the world. Unfortunately, because of their reliability, they are one of the most neglected items on the tank. This neglect, and ignoring safety warnings, has led to the injury and deaths of several soldiers in the last several years. All were avoidable.

The NBC system utilizes bleed air from the turbine engine intake. This air is temperature and humidity regulated in the sponson box area and then filtered in the

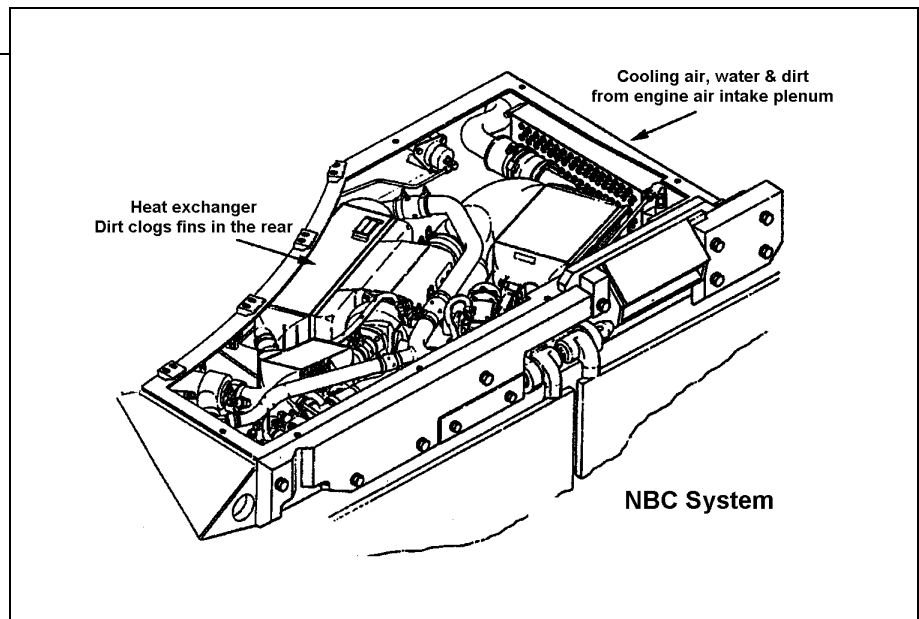


Fig. 4

crew compartment before it is bulk dumped and/or delivered to the individual crewman’s protective mask. Cooling air is also drawn into this area through a particle separator that shares the incoming raw air by the engine air filter intake. The main cause of problems is the neglect of the sponson area. (See Fig. 4)

During semiannual services, the sponson area must be thoroughly cleaned and inspected. All hoses and clamps must be perfect. There must be no water or dirt in this area. There are three radiator-like devices in the sponson (heat exchanger, condenser, and pre-cooler) that must not be clogged with dirt. Water and dirt enter this area when mud builds up in the engine air intake area and the tank is parked facing downhill. Although the system was designed to operate in adverse conditions, when it is not operating, water can accumulate in the sponson area. A mixture of water and fine dust can enter the heat exchangers and the air cycle machine. If they are allowed to remain submerged in this corrosive, cement-like mixture, the ACM can corrode over time and the exchangers can become blocked. This is why it is essential that a tarp be placed over this area and tanks parked with the rear end facing downhill in wet climates.

The most difficult radiator face to check for dirt blockage is the heat exchanger because its inlet face is inboard, by the turret wall. In normal operation, the dirt/dust passes through the heat exchangers, ACM, and pre-cooler and is dumped overboard. When also mixed with water, it tends to stick to the face of the heat exchanger. During operation, chunks of mud may be passed through

the heat exchanger and into the ACM. This debris can cause high speed fan instability. This instability can cause an ACM stall/seizure resulting in high temperature bleed air reaching the M48 charcoal impregnated paper filters in the crew compartment. A spontaneous fire can result if the crew does not shut the NBC system down when an overtemp warning light illuminates. Letting the system “cool down” and then restarting it does not solve the problem; it only makes the probability of a fire greater! An MWO is being worked to try to limit mud ingestion in this area, but for now it must be inspected and cleaned during semi-annual services.

Several Safety of Use Messages have been released about how to check the NBC system and the importance of the warning lights to the crew. Additionally, there is a new MWO to add a warning buzzer when an over-temperature condition exists. None of these measures will work unless leaders understand both how the system functions and how well their crews and mechanics are trained.

Another unnecessary damage area can occur when you replace the bolts on the sponson covers over the NBC system. Not all bolts are the same length, and if the longer bolts are used over the pre-cooler location, they will do about \$4,200 worth of damage. An MWO is also in process, but in the meantime, study which bolts go in which holes carefully.

### Self Cleaning Air Filters

One of the greatest inventions of the 20th century is being added to many of your tanks — the Pulse Jet System (PJS) self-cleaning air filter. For 18 years,

we've trained soldiers to check and clean their air filters at every available opportunity. Now, along comes a self-cleaning air filter, and the worst thing you can do is open it and check it. Yes, it's true: we're actually telling you to do less maintenance! Let me explain why.

The PJS works by back-flushing different sections of the air filters sequentially with pulsed air to remove accumulated dirt. The dirt is drawn out of the filter plenum area by the scavenger fan and tossed overboard through the left rear grille door. The cycling of this function is determined by a number of calculations and the engine speed. At any given time, if you open the air filter box, there may be a dirty filter, or there may be unscavenged dirt in the bottom of the box. Unfortunately, you cannot tell by looking whether or not the PJS is working or where it is in its cycle. You must rely on the low inlet pressure warning light. If it does not come on, all is well. Additional checks are in the new TM change and a MAM that has been distributed to the field. In the case of PJS, less crew maintenance is better!

Another great killer of both old and PJS filters is soldiers with hoses on wash racks. Do not spray water directly into the air intakes! Although the tank can operate in a downpour, washing a lot of water into the intake and then turning the vehicle off in a short while will leave you with a plenum full of wet, rotting filters.

### **Engine and Transmission Oil Coolers**

Speaking of things that dump air out of the rear grille doors, one neglected area is the oil coolers. They will frequently become clogged from the inside because the fans that drive cooling air through them utilize air that is drawn from around the tank as it moves. If the air is dusty or wet, eventually there is a deposit built up on the coolers. The easiest method to clean them is to remove the two access covers on the top of the ductwork, and with the engine running, flush large amounts of water through them. On older tanks, you must remove the rear deck to do this; newer tanks have access hatches in the back deck. High engine or transmission oil temperature lights are a sure sign of clogged coolers. Any fuel or oil leak that occurs and is repaired is also a reason to clean the oil coolers as some of this liquid will have been drawn through and deposited on the fins.

### **Fire Extinguishers and Halon**

There are a lot of rumors about the Halon that is used in the fire suppression

system and in the handheld extinguishers. First of all, Halon is safe to breathe. It irritates your throat, but it will not harm you in the concentrations that are used to extinguish fires inside the crew compartment. Halon is, however, an ozone-depleting chemical and may be replaced for environmental, not health, reasons.

A replacement for Halon for use in engine compartments has been found and is being tested. Eventually all tanks will receive a free MWO to change out their Halon engine fire extinguishers. The crew compartment is a different story.

The entire Army, less the Abrams tank, has returned to using CO<sub>2</sub> hand-held fire extinguishers in vehicles. The reason Abrams tanks still have Halon is because CO<sub>2</sub> will suffocate you if you do not evacuate the vehicle. CO<sub>2</sub> is heavier than air and quickly settles in the driver's compartment. The driver can be quickly knocked out and impossible to evacuate if you use CO<sub>2</sub> inside the crew compartment on a tank! Safe alternate agents are under investigation, but until a solution is found both the crew fixed extinguishers and hand-helds must be Halon-only. Do not try to improvise on this one. You could cause a death!

Leaders should also thoroughly understand how to safely remove and replace fixed fire extinguisher bottles. If done improperly, they can become deadly missiles. Maintenance people have been killed by not properly following the procedures. Another aspect of this is that many mechanics forget to rearm the bottle after it is remounted in the vehicle. As a pre-combat check, this is a must-do! It is also an important post-maintenance quality check.

## **TURRETS**

### **External Auxiliary Power Units (EAPU)**

For years, we all screamed for an auxiliary power unit (APU) on the Abrams. We finally have one, but are not using it enough. Yes, there were problems when it was initially fielded, but they are being fixed free of charge to the units.

Currently, there is an MWO team going around to replace the 12 volt starter with a more durable 24 volt one. A new voltage regulator will also be installed. This will allow a full 2 Kw of power at high temperature and high load — a condition that would cause the original design to cut back to only a 1 Kw output. And finally, the more than useless 24 volt EAPU battery is being removed and replaced with a NATO receptacle.

Now you will always start the EAPU from the vehicle batteries, or it can be slave-started from any 24 volt source. As a backup, there is still the manual rope. The procedures for both starting the EAPU and generating power to keep the vehicle batteries charged have been carefully rewritten in the -10 TMs. You can run the EAPU and not charge the batteries if you do not have all switches in the proper position during operation. This is a crew skill, just like everything else on the tank, and leaders should know and understand all of the operational modes.

Operationally, we are still not exploiting the capabilities of the EAPUs. SOPs need to be revised and TTPs developed that have crews power up their EAPU and shut down their main engine whenever they will be stationary for more than 5 minutes. The savings in fuel and engines could be astronomical!

### **Muzzle Reference Sensor**

The muzzle reference sensor (MRS) contains a radioactive tritium light source. Some crews and master gunners have been attempting to adjust the focus with improper tools. This is not an organizational level task, and the safety and administrative complications if you break the tritium vial are not worth attempting this task.

This article was not intended to be a complete rundown of everything you need to know about Abrams maintenance as an Armor leader. It is, however, a minimal list of everything that you should not let go wrong as a responsible leader. If every vehicle commander simply knew and did the above items properly, you would all have a lot more dollars to spend on training. These vehicles are going to be with us for a long time, and it is your responsibility to pass these lessons learned on to the next generation of tankers.

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COL Christopher Cardine, a 1971 graduate of the U.S. Military Academy, served over 27 years in various armored and cavalry units including the 68th and 77th Armor and 7th and 11th Cavalry. His last three assignments were as Commander, 3-68 AR, Product Manager M2/3 Bradley Fighting Vehicle, and Project Manager M1 Abrams Tank. He is currently Director of Business Development for Signal & Systems, Inc., in Troy, Mich.

## TEAM RECON:

# A New Approach To Armored TF Reconnaissance

*One Unit Hardens the HMMWV Scout Platoon to Increase Its Survivability*

by Lieutenant Colonel Henry M. St-Pierre and First Lieutenant Jamie E. Warder

### Overview

HMMWVs have given the scout excellent mobility, a decreased signature, and maximum flexibility in task organization. In both training and war, HMMWVs have proven to be an effective platform for reconnaissance at the armored task force level. This is not to say, however, that the HMMWV is a perfect match for mounted scouts. The 1995 Rand Study on Reconnaissance concluded that the issues of HMMWV mounted scout capability and survivability remain unsolved. That is, the same aspects that make the light scouts stealthy also make them very vulnerable. The HMMWV organization means today's scout platoon goes into combat essentially unarmored and too lightly armed against even the most rudimentary of heavy weapons a Third World nation can bring to bear. This organization presents two challenges to the task force commander. The first is that when the platoon, whether in its entirety or in part, is unfortunate enough to become decisively engaged, scout elements in contact do not have the organic assets to effectively break contact and "retain the freedom to maneuver." Second, the scout platoon's lack of survivability often presents the task force commander with a dilemma — "send maximum reconnaissance forward" and risk losing it early, or husband his forces and miss some important piece of information because not all "eyes" were forward where they belong.

To help resolve this problem, 1st Battalion, 33rd Armor, 3rd Brigade Combat Team, 2nd Infantry Division, at Fort Lewis, Washington, has developed a unique solution, Team Recon. We task organize the scouts with heavy assets such as tanks or Bradleys, along with mortars, and if the situation warrants, engineers, and put them under centralized command and control to accomplish a myriad of security and reconnaissance tasks. This non-doctrinal task organiza-

tion not only increases Team Recon's long-term use as a reconnaissance asset over an extended amount of time, but also increases its ability to provide fires on an enemy force and help extricate the scout platoon should it get into trouble. This hybrid organization takes advantage of the scout platoon's stealth while at the same time increases its lethality and survivability by adding armor and indirect fires as combat multipliers. Using this concept, TF 1-33 has enjoyed success during brigade level exercises in the desert of Yakima Training Center and in the heavily wooded defiles of Fort Lewis, Washington.

Team Recon normally consists of the scout platoon, a tank platoon, a mortar section, an engineer section, two infantry dismounted squads, medical and maintenance assets, and a command and control slice controlled by the HHC commander who, again, non-doctrinally, becomes Chief of Recon. Team Recon's basic concept was borrowed from the armored cavalry troop. The force was tailored by TF 1-33 based on the observations gained by units undergoing training at NTC, JRTC, and the CMTC.

Team Recon addresses and, in part, rectifies two problems inherent to the HMMWV-pure scout platoon — survivability and lethal capability. Having "killers" forward to interdict quickly if the scouts are decisively engaged makes it easier for scouts to break direct fire contact, maneuver, and regain visual contact. The result is that the scouts stay alive, retain maneuverability, and continue to report accurate information. Team Recon also makes it easier for the task force commander to put maximum reconnaissance forward. With tanks to protect forward assets, infantry, mortars, and engineers can become major force multipliers in the reconnaissance fight. Team Recon affords the commander the ability to overwatch Named Areas of Interest

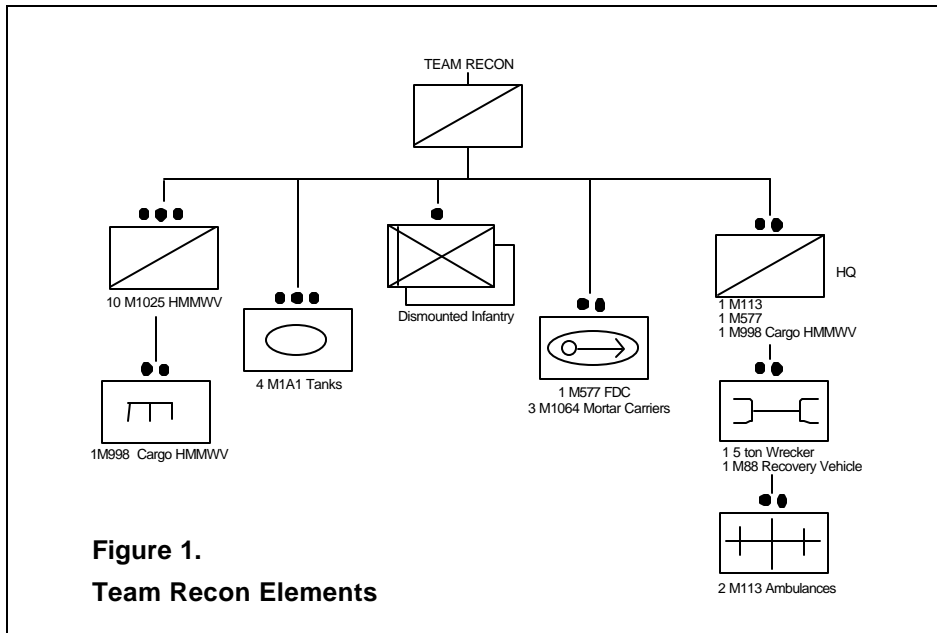
(NAIs) assigned to him by higher headquarters, conduct dismounted ambushes, and perform covert breaches before the attack.

### Task and Purpose of Each Element for Reconnaissance Operations (Task Force Offense)

The role of the scouts in Team Recon is very similar to their role when conducting operations without the benefit of added firepower/protection. Scouts are the forward element in Team Recon and the platoon conducts zone, route, or area reconnaissance to provide critical battlefield information to the task force commander. Good communication between the scouts, the tanks, and the Team Recon commander is critical to ensure that the tanks operate far enough back to preserve the scouts' stealth, but close enough to allow them to bound forward and provide direct fire support if necessary. The increased forward security from tanks allows scouts to leave fewer personnel with the vehicles and put more dismounts on the ground. Additionally, with the Team Recon NCOIC controlling vehicle and casualty evacuation, the scout platoon sergeant is able to concentrate more on fighting a reconnaissance fight and less on the logistical fight.

The tank platoon can remain as a platoon, with the four tanks working together, or fight as two sections. Their mission is to provide firepower to support the extraction of reconnaissance elements if they become decisively engaged. The armor platoon does not operate as part of a hunter/killer concept. Rather, the tanks become killers only if the scouts become embroiled in a firefight from which they cannot safely withdraw.

The tanks do, however, play an active role in the reconnaissance fight. They can use thermal capabilities to assist in long-



**Figure 1.**  
**Team Recon Elements**

range reconnaissance. They have the responsibility to locate enemy that has infiltrated behind or to the flanks of the scouts. Additionally, they provide local security for mortars and the Team Recon CSS assets.

The mortars provide indirect fires for targets of opportunity under the control of Chief of Recon or the scout platoon leader. The protection provided by the tanks allows the mortars to bound much closer to the scouts. This gives scouts greater range in engaging targets with mortar fires. The mortars also continuously update final protective fires, based on the scouts' front line trace, and are prepared to provide immediate HE and smoke to facilitate the safe extraction of forward reconnaissance elements. The mortars operate on the Team Recon radio net and clear all fires through the Chief of Recon.

For reconnaissance operations, Team Recon may utilize a squad or section of combat engineers to provide forward mobility and countermobility expertise. The engineers often are attached directly to the scout platoon. They are task organized according to the mission and are transported either in the scout HMMWV or in their own cargo HMMWV. The engineers are responsible for conducting detailed obstacle intelligence, bypass/breach marking, and bridge classifications. The sappers also have the ability to conduct covert breaches or prepare command-detonated demolition for a breach effort at a later time (i.e. task force LD).

When the Task Force is in the offense, dismounted infantry give the task force commander the option to destroy or fix opportunity targets with direct fire, either during the reconnaissance fight or after

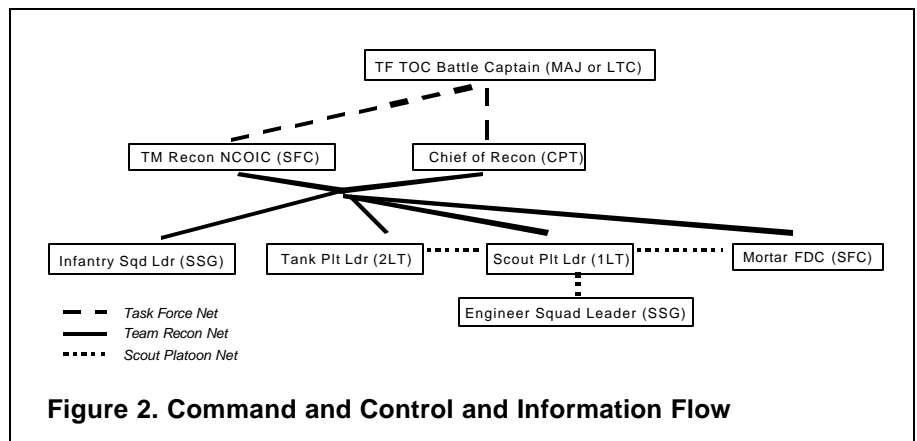
task force LD (without compromising scout assets). The dismount squads or sections also provide additional personnel to watch NAIs and set direct fire ambushes. Rather than attrit the reconnaissance effort by leaving scouts in contact with all enemies they encounter; the scouts can pass visual contact off to the infantry early and then continue to conduct forward reconnaissance. The infantry allows Team Recon to put maximum reconnaissance forward. The dismounts are inserted using IFVs, trucks, or even tanks.

The headquarters element of Team Recon consists of a Chief of Recon, a Recon NCOIC, a jump aid station, and a maintenance/recovery slice. The Chief of Recon is the HHC commander. As the most senior and experienced company grade officer in the task force, he can provide the leadership necessary to command and control the many elements of Team Recon. The Chief of Recon uses a Headquarters' tank or an APC platform and usually operates with the tanks one to two

kilometers behind the FLOT. The Recon NCOIC acts as a first sergeant for Team Recon. He is responsible for logistical execution, battle tracking, and employment of the medics and maintenance. The Team Recon NCOIC for TF 1-33 comes from the S-3 shop and uses an M577 from the battalion communications section to track the battle. All tactical and logistical reports are sent to the NCOIC and he is responsible for relaying the reports to the battalion TOC.

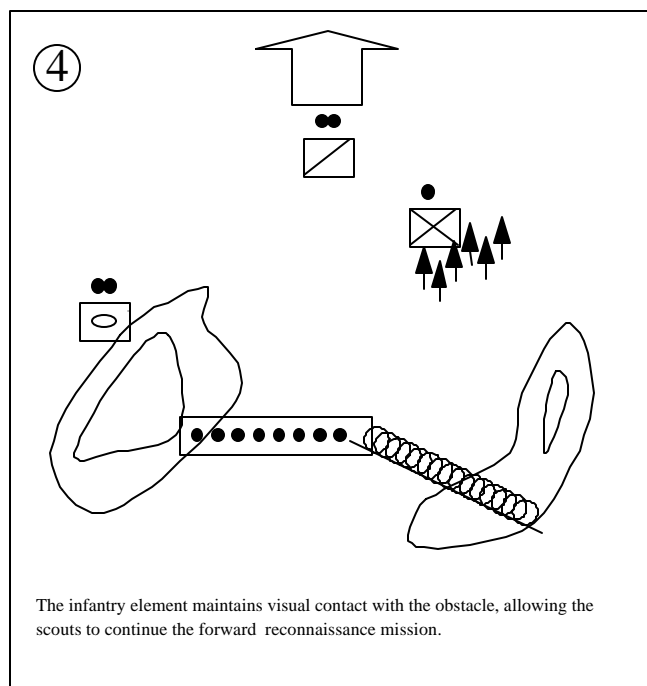
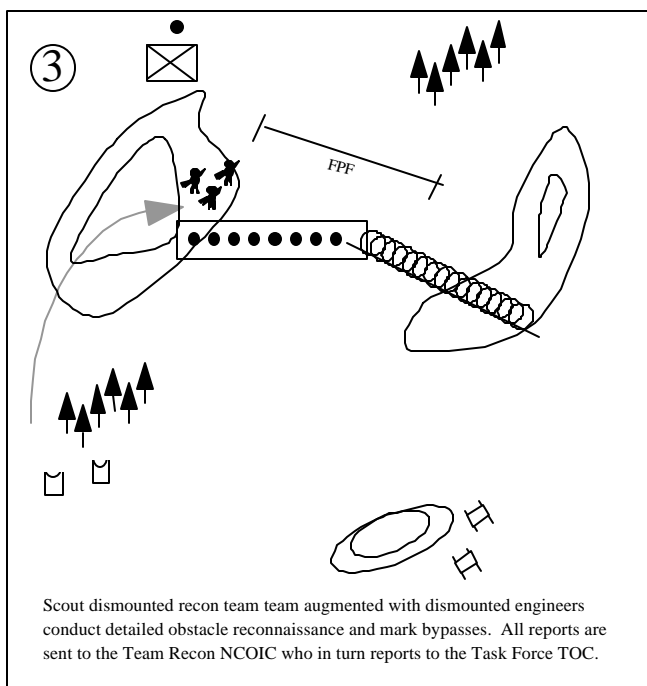
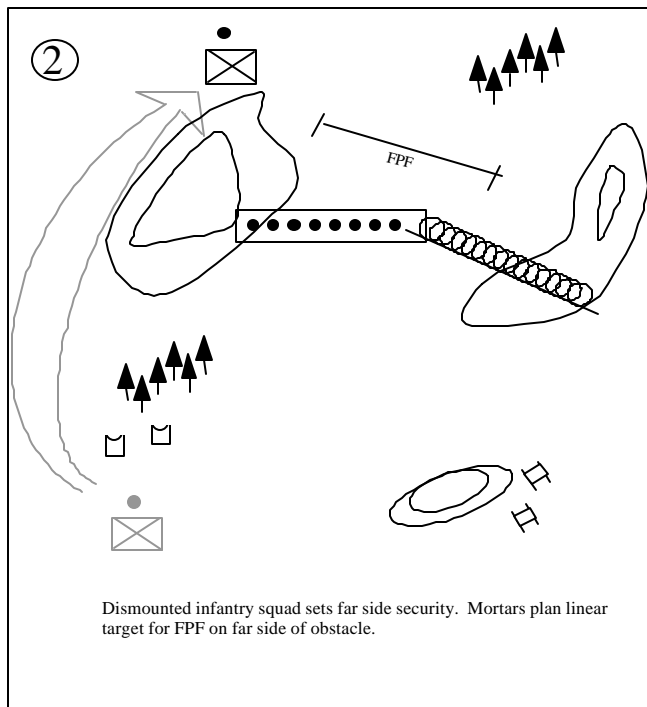
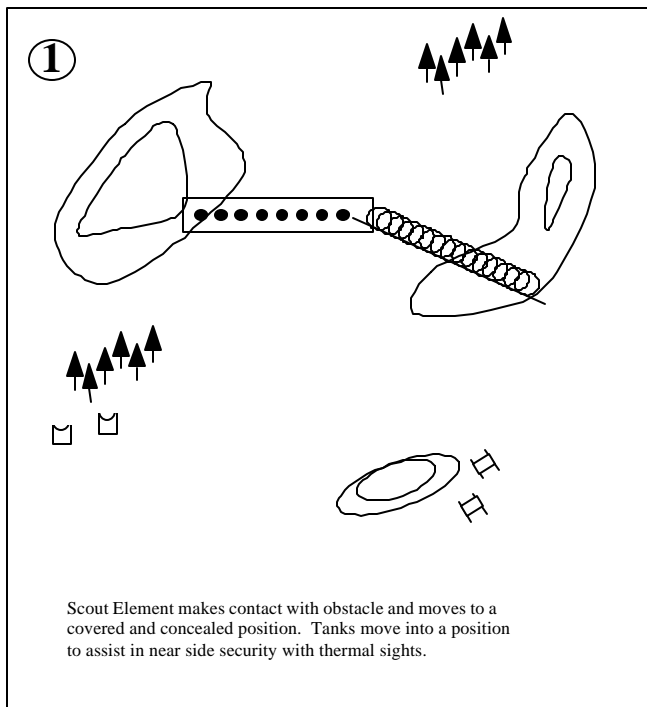
**Team Recon and Counter-Recon (Task Force Defense)**

Although Team Recon was originally conceived for reconnaissance operations, the embedded command and control aspect of its organization makes it very compatible to counter-reconnaissance operations as well. In traditional counter-reconnaissance operations, the scout platoon usually establishes a screen line in front of a company team designated as a "counter-reconnaissance" team. There are some common problems when this type of counter-reconnaissance organization is used. First, there is often a muddled command and control relationship between the task force, the counter-reconnaissance company team, and the scout platoon. This is a result of a task organization which is usually thrown together quickly and with limited command and control planning. Second, during continuous operations, the reconnaissance and security planning phase usually takes place while the company teams are conducting operations. This makes it extremely difficult for the leadership of the counter-reconnaissance units to participate in the R&S planning process or conduct any meaningful troop leading procedures together. Finally, when a



**Figure 2. Command and Control and Information Flow**





**Figure 3. Team Recon Obstacle Drill — Showing the Elements of Team Recon Working Together**

company team fights in the counter-reconnaissance fight, they are usually severely handicapped for the ensuing defensive operation. Usually, the company team leadership is not part of the battalion orders process and dissemination of orders at the company level is very difficult while in the screen line. The result is a company team that is not well prepared for follow-on operations and usually has little or no effect on the defensive battle that occurs once the screen ends.

Team Recon alleviates many of the difficulties associated with a traditional counter-reconnaissance organization. Team Recon organically contains all of the elements necessary to create a formidable screen line, scouts, armor, indirect, and a well established command and control cell. As the commander dedicated solely to the reconnaissance/counter-reconnaissance fight, the Chief of Recon can take an active role in the planning process at the task force level. He also can conduct much more detailed troop

leading procedures with his team prior to the mission. The result is a counter-reconnaissance effort that is much better informed and fights more like a cohesive team. Additionally, with Team Recon handling the counter-reconnaissance fight, the task force commander is no longer a full company team short during preparation, planning, and fighting of the defense. Once the screen is complete,

*Continued on Page 29*

# Will the New Brigade Reconnaissance Troop Be Adequately Protected?

by First Lieutenant Wayne T. Westgaard

General William Hartzog, former commander of TRADOC, held a press conference on June 9, 1998 to outline the New Division Design for the next century. General Hartzog explained the reason for the changes in the division organization: "At the end of the Cold War, the U.S. Army was largely a very heavy army, not as strategically relevant to all of the tasks of the early 1990s that were emerging, and certainly not anticipating to be strategically relevant to the future in the early 21st century."<sup>1</sup>

From the cavalry community perspective, the most notable change is the creation of the brigade reconnaissance troop assigned to each maneuver brigade. "There's a brigade reconnaissance troop that's never existed before... mounted in armored HMMWVs with some very good devices for ground intelligence collection," Hartzog said.<sup>2</sup>

I suggest that the XM1114 HMMWV does not have enough armor protection, mobility, or firepower to sustain a brigade reconnaissance role.

The new brigade reconnaissance troop will take on the traditional cavalry roles on the battlefield by performing reconnaissance and providing security in close operations for the brigade. The new organization will, according to General Hartzog, consist of 49 soldiers using the XM1114 Up-armored HMMWV. Currently, a divisional cavalry squadron uses the M3A2 Cavalry Fighting Vehicle (CFV) as its scouting platform while a heavy task force uses the HMMWV. The mission of the new reconnaissance troop will more closely resemble that of a divisional cavalry squadron than a task force scout platoon. I believe the HMMWV's lack of survivability, lack of mobility, and lack of firepower render it the wrong choice for this role.

For almost 20 years, the HMMWV has served the U.S. Army as an all-terrain, all-purpose vehicle. During these years, the design has been adopted to serve as a field ambulance, an air defense artillery vehicle, and an armored cavalry anti-armor vehicle equipped with TOW missiles. The HMMWV in support of the

Bosnia mission has gone through some design changes, including the addition of some 6,000 pounds of armor. This affords more crew protection against mines in the UXO-rich environment of Bosnia. This adaptation, coupled with mine awareness training of all crews, has resulted in few injuries due to mine strikes in Bosnia. The XM1114 has been a great success story of the Bosnian mission, although the added weight has caused rapid wear of some components.

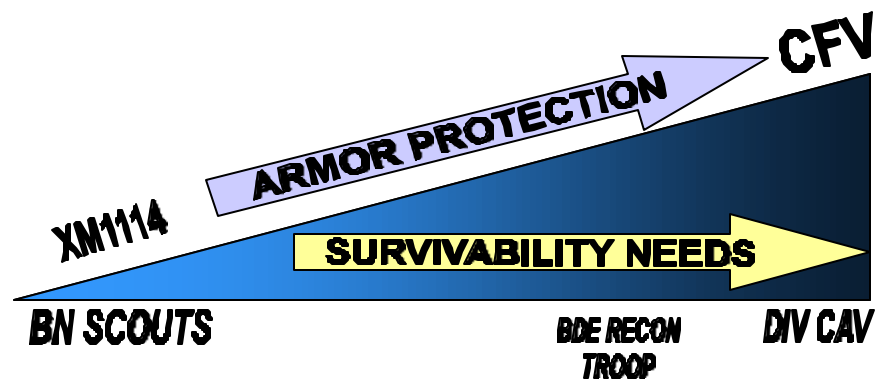
In support of the brigade reconnaissance mission, the new reconnaissance troop will push out ahead of a brigade-sized element, confirming or denying the enemy's activity. The troop will need to conduct such missions as route, zone, area reconnaissance, and screens for a brigade-size element.<sup>3</sup> During these missions, the troop will also have to fight the counterreconnaissance battle for the brigade commander, and will need to destroy the oncoming threat reconnaissance element while conducting a battle hand-over with the following battalion. It is vital to the maneuver brigade that the reconnaissance troop survives long enough to pinpoint the enemy positions, axis of advance, and disposition. Is the XM1114 the best vehicle for this mission? I do not think the troop will last long enough in battle to complete its mission. A troop using the CFV would survive longer in the same situation.

The survivability of a combat platform relies on the following: mine and ballistic protection, size and silhouette, and stealth. According to a recent *ARMOR*

article by an engineer in this field, "In general, wheeled platforms are more vulnerable to small arms fire, grenades, mines, and artillery fragments; due to the inherent weakness of wheeled suspension designs, components, and tires."<sup>4</sup> The HMMWV cannot take prolonged attacks by small arms or mines due to the light armor protection. The armor package added to the XM1114 consists of ballistic windows and rolled homogeneous armor plates added to doors, sides, and undercarriage. The armor and the ballistic windows provide protection for up to a 7.62mm round, but if bullets strike the windows, visibility is reduced significantly. And the armor doesn't protect against RPGs, making the vehicle vulnerable to almost every threat reconnaissance element. The light armor provides protection against AP mines and grenades, but not for the entire crew: the gunner is always exposed to the dangers of mines, grenades, and small arms because the vehicle's weapon is mounted externally.

The fundamentals of reconnaissance call for gaining and maintaining contact with the enemy. Because the XM1114 is so vulnerable to dismounted enemy OPs I believe this will lead to a shallow reconnaissance of the enemy's main defensive belt during offensive operations. In order to conduct an in-depth reconnaissance of a main defensive belt without suffering high attrition rates, a CFV would be preferable to the XM1114.

The Army wrestles with the question of whether to use a tracked vehicle or a



wheeled vehicle each time a new platform for a ground weapons system is needed. The Army has tested and studied the advantages and disadvantages of wheeled and tracked combat platforms for the past 30 years.<sup>5</sup>

In 1988, TRADOC conducted such a study. The findings are shown in the table at right, which compares the average 100km-mission travel time for both wheeled and tracked platforms as off-road usage increases. The data clearly shows that, as cross-country travel increases, wheeled vehicles require more travel time than do tracked vehicles for the same distances.<sup>6</sup> Tracked vehicles offer the best solution for a versatile platform that is required to operate over diverse terrain. Some opponents to this may say that wheeled vehicles have worked well for the many miles traveled during the Bosnia mission and wheeled success must translate into other operations. However, when making these assumptions remember that future combat will not always be on roads and unrestricted terrain.

On the future battlefield, the brigade reconnaissance troop will deploy anywhere in the world and on all types of terrain. Using Bosnia and the NTC as the *only* test beds for maneuver studies adds incorrect assumptions to equipment capabilities. I mentioned the Bosnia mission as a success story for the HMMWV. As one recent account by another *ARMOR* author described it, "While the up-armored HMMWV is great to patrol the countryside and perform administrative tasks... they are not, and should never be considered a suitable substitute for the Abrams and CFVs of our cavalry organizations."<sup>7</sup>

Adding six thousand pounds of armor to the weight of the XM1114 without modifying the chassis to accommodate the added weight was not a good idea. The great success of this vehicle in Bosnia is due in part because patrols are told to "stay on approved routes." From June to September 1998, my platoon encountered the following problems with our vehicles due to the added extra weight:

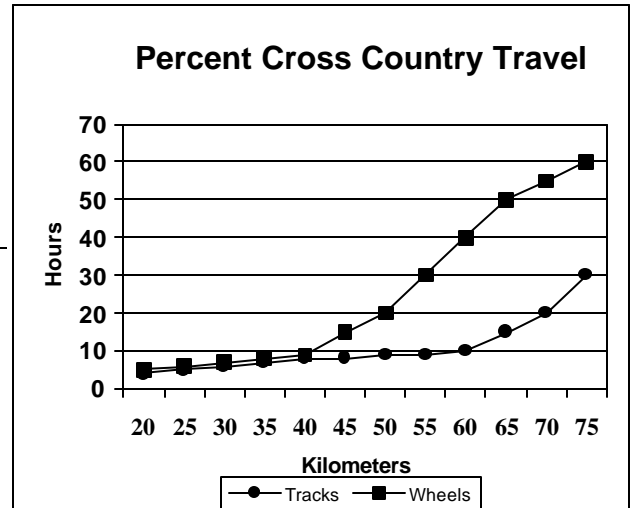
- Brake system components routinely needed replacement every six weeks due to brake wear.
- Power steering pump seals blew out under increased stress.

- Tires wore down notably faster.
- Lug nuts and bolts often sheared off.
- Engines overheated from turbocharger placement on engine. The turbocharger blocks the natural convection heat loss of the engine, holding all the heat near the fuel pump, which causes vapor lock.

The new XM1114 is not the same HMMWV you enjoy back in the garrison environment, a vehicle that requires little maintenance and is able to leap small mountains in a single bound. More field studies of the XM1114 and capability comparisons using track vehicles must be conducted before a final decision is made on whether to outfit the new brigade reconnaissance troop with XM1114s or CFVs. "The HMMWV has no more than bare minimum capabilities in close combat. Mobility is inferior to tracked vehicles,"<sup>8</sup> "as is armor protection and load carrying capacity."<sup>9</sup>

Firepower! There is no accurate heavy weapons system for the XM1114. Most often, HMMWV scouts use the M2 .50 cal MG and the MK19 grenade launcher. Remember the mission of the brigade reconnaissance troop. Gain and maintain contact with the enemy while fighting the counterreconnaissance battle for the brigade commander. Read an example from the recent past of the HMMWVs outfitted with MK19 and heavy machine guns tested under enemy contact in Somalia:

"In the breakthrough to Task Force Ranger during 3-4 October 1993, 40mm MK19 grenade machine guns mounted on HMMWVs were used by the 10th Mountain Division to provide direct fire support during the movement through Mogadishu's streets.<sup>10</sup> The minimal capabilities of the 40mm HEDP rounds seemed unlikely to overcome a well fortified bunker, let alone the steel hide of any but the lightest of armored vehicles... the small amount of explosives in the 40mm projectile seriously limited its usefulness against well trained and well prepared foes."<sup>11</sup>



During Operation Restore Hope, armored vehicles would have made a great impact on force protection by providing more security for dismounted infantry. This operation is an example of how a low intensity environment goes high intensity rapidly. The ability to show force is a great deterrent to a warring faction during OOTW. "Crowds keep their distance from armored vehicles while crews can safely operate from an open protected position. Their physical height over the crowds makes them an asset in OOTW."<sup>12</sup>

The new brigade reconnaissance troop will encounter threat armored vehicles on the future battlefield. MK19s and machine guns won't defeat enemy armor, only suppress it. The weapons systems on the XM1114 will not pack enough punch for the troop to survive and report, thereby rendering the unit useless. The troop will need the capability to defeat light armored reconnaissance vehicles.

The Army has already built the vehicle needed for this reconnaissance mission, the CFV. In so many other ways, the CFV allows the scouts to accomplish the fundamentals of reconnaissance. Look at the comparison at right, from *FM 17-98, The Scout Platoon*, and note in how many categories the CFV excels compared to the HMMWV: "To some degree the scout's capability is dependent on his equipment. The two types of scout platforms have distinctly different characteristics. Both vehicles, when employed with the appropriate tactics, techniques, and procedures, are effective reconnaissance platforms. The scout must understand his equipment and its capabilities, then minimize its limitations."<sup>13</sup> The HMMWV is a great platform for the battalion scout's mission but not for a division cavalry or brigade reconnaissance troop. The CFV will provide a more survivable platform to conduct reconnais-

sance in support of a brigade-size element.

## Notes

<sup>1</sup>General William Hartzog, "News Briefing On The Army's Redesign Of Divisions," U.S. Army Training And Doctrine Command, Washington, D.C., June 9, 1998.

<sup>2</sup>Jim Caldwell "New Design Framework For

Army XXI Heavy Division" TRADOC News Service, Washington, D.C. June 9, 1998.

<sup>3</sup>*FM 17-95, Cavalry Operations*, Headquarters Department of the Army, December 1996, Washington, D.C., p. 1-15.

<sup>4</sup>Paul Hornback, "The Wheel Versus Track Dilemma," *ARMOR*, March-April 1998.

<sup>5</sup>Hornback.

<sup>6</sup>"Mobility Analysis for the TRADOC Wheeled Versus Track Vehicle Study, Final Report,"

Robert F. Unger, Geotechnical Laboratory, Department of the Army, Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., September 1988, p. 1.

<sup>7</sup>LTC Michael Prevou, "HMMWVs Lack the Firepower and Protection for Bosnia Role," *ARMOR*, January-February 1998, p. 36.

<sup>8</sup>CPT Kevin J. Hammond and CPT Frank Sherman, "Sheridans in Panama," *ARMOR*, March-April 1990, p. 1.

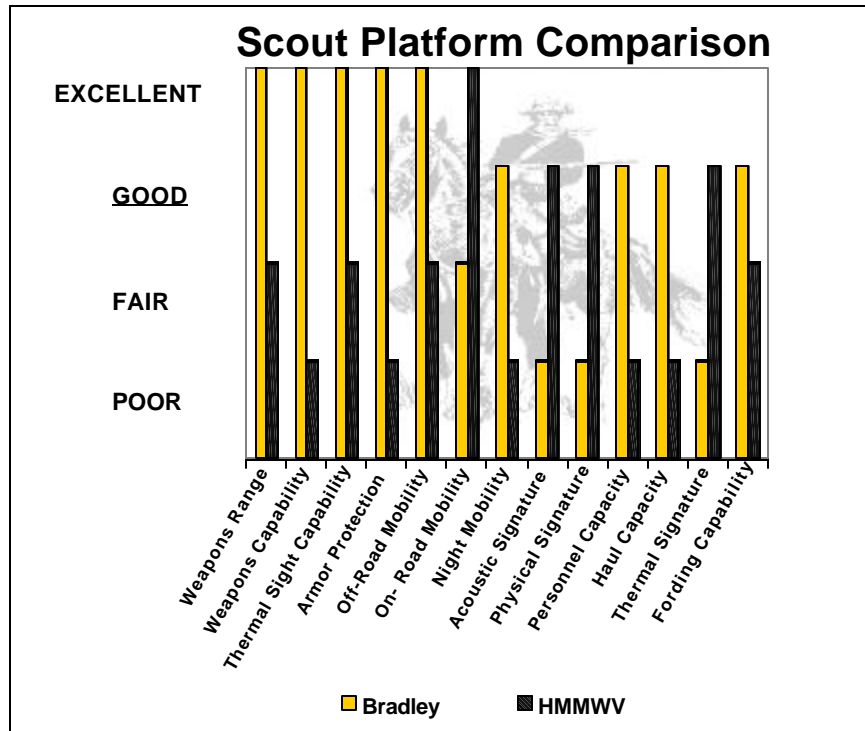
<sup>9</sup>Stanley C. Crist, "Too Late the XM8: Alternatives to the Armored Gun System," *ARMOR*, January-February 1997, p. 17.

<sup>10</sup>CPT Charles P. Perry, "Mogadishu, October 1993: Personal Account of a Rifle Company XO," *INFANTRY*, September-October 1994, pp. 28-29.

<sup>11</sup>Crist, p. 17.

<sup>12</sup>Prevou, p. 36.

<sup>13</sup>*FM 17-98, Scout Platoon*, Headquarters Department of the Army, September 1994, Washington, D.C.



1LT Wayne Westgaard is a 1996 graduate of Texas A&M University with a BS in political science. He received his commission as an armor officer through ROTC. Currently, he serves as a scout platoon leader for Bandit Troop, 1st Squadron, 1st Cavalry in Büdingen, Germany. He has also served as asst. S4 for 1-1 Cav and Base Defense Operations Officer at Comanche Base, Bosnia, for 4th Bde, 1AD.

## TEAM RECON From Page 26

Team Recon is a perfect force to provide rear security for the task force in the defense.

### Issues and Working Solutions

Whereas Team Recon has proven to be an excellent asset to Task Force 1-33, it has also been a challenging endeavor that presents many difficult issues. The Chief of Recon is a very time consuming, and possibly, a full-time job. Understanding the doctrinal responsibilities of the HHC Commander, we made the decision to remove him from the field trains and make him a forward combat commander. His role in the field trains is taken over by the HHC 1SG, XO, and CSM. The S-3 Air is also a good candidate to be Chief of Team Recon, depending on his experience. The non-standard task organization makes training and fighting as a team

very difficult. Team Recon often contains elements that have not trained extensively together. Habitual relationships, a good SOP with easily rehearsed extraction drills, and good command and control mitigate this problem but do not solve it.

### Conclusion

Preservation of the scouts is critical to winning the reconnaissance/counter-reconnaissance battle and essential to the commander's IPB and decision-making process. Team Recon may not be the best answer nor is it the only answer, however it has provided 1-33 AR a mix of stealth and lethality that, in past tactical training, helped set the conditions necessary for us to win several of our reconnaissance battles. The success in these fights later proved critical to winning the overall fight.

LTC Henry St-Pierre is a 1979 graduate of the Virginia Military Institute. He served as a platoon leader and company commander in 82nd Airborne Division, a tank company commander in 469 AR, an operations officer and executive officer in 1st Squadron, 2nd ACR, and the Senior Armor OC at the JRTC. Currently, he is the commander of 1-33 Armor Battalion, 3rd Brigade, 2nd Infantry Division at Fort Lewis, Wash.

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An Experiment Reconsidered:

## The Theory and Practice Of Armored Warfare in Spain

October 1936 – February 1937 (Part 1 of 2)

by Dr. John L. S. Daley

Over fifty years after its conclusion, the Spanish Civil War of 1936-1939 continues to pose a problem for historians of armored warfare: In seeking the roots of the mechanization-oriented doctrines which were to become a prominent feature of World War II, some historians have held that Spain was an almost ideal tactical laboratory; others have concluded that experiments conducted there yielded few if any definite conclusions.<sup>1</sup> These opinions, although diametrically opposed on the question of Spain's viability as a testing ground, share a common foundation: an assumption that only grand tactics are deserving of the military intellectual's attention. The most prominent military intellectuals of the interwar period

took this assumption more or less at face value: If tactically independent mechanized corps were massed in sufficient density against a sufficiently narrow segment of the enemy's defenses — a strategically significant success would follow. Small unit tactics — particularly those involving the close coordination of tanks with non-mechanized infantry — would scarcely matter where the tank formations were too small to meet the larger requirement.

From October 1936 to February 1937, as Francisco Franco's Nationalist rebels laid siege to Republican Madrid, contemporary military intellectuals were proven wrong. Neither the German *Imker*

*Drohne* group aiding Franco nor the Soviet Krivoshein Detachment, which brought the tank to the Republic's Popular Army (*Ejercito Popular*), possessed enough tanks to execute the tactically independent exploitations envisioned by interwar theorists. Tank companies were employed piecemeal, in support of dismounted infantry, and often without the element of surprise. Nevertheless, tank forces proved useful in these limited operations once effective small unit tactics had been developed. Moreover, contrary to another article of contemporary conventional wisdom, the Germans were not the only ones to benefit from experimentation in the "Spanish Laboratory;" their Soviet counterparts not only learned, but learned first. Early Republican tank operations, although hardly the theoretical

Continued on Page 39





Soviet Armor in Spain:

## Aid Mission to Republicans Tested Doctrine and Equipment

by Colonel Antonio J. Candil, Spanish Army

*For many years, the Spanish Civil War has been portrayed as a romantic episode of the 20th century, with defenders of freedom and democracy confronting the evil forces of totalitarianism and dictatorship. This is the picture that emerges from some of Ernest Hemingway's books and also to some extent in Hollywood's movies. In reality, the civil war was not simply a battle between defenders of freedom and evil Fascists. The truth was that those who rallied behind the flag of democracy and freedom were a mixture of romantic and idealistic people, while most of the conservative forces of the nation aligned with the Nationalist side.*

*Soon after the conflict began, the Republicans were being used as a tool of convenience by the communists, and ultimately by the Soviet Union, and the Nationalists had become easy prey for the rising Axis powers. In the end, the Spanish Civil War came to be a clash between Soviet communism and the Nazi and Fascist ideologies, resulting in the deaths of more than half a million people and the destruction of the country.*

*This article focuses on the role played by Soviet armored forces with the aim of examining the experience they obtained in the field of armored warfare.*

By 1936, the year the Spanish Civil War started, the Soviet Army's mechanization doctrine was well advanced. The Red Army had established four mechanized corps, six independent mechanized brigades, and six independent tank regiments, putting them far in advance of some Western armies, where conversion to mobile warfare was much slower. It is generally agreed that this advantage was later squandered by Stalin, who, among other reasons, drew the wrong lessons from the Spanish conflict. As a result, he disbanded the mechanized corps and limited tanks to the role of infantry support. As events would later prove during World War II, the Soviet Army would pay dearly for this fateful decision.

Among Soviet military personnel fighting for the Republican side were a number of officers who rose to prominence during World War II and were still active



in the 1950s and '60s, among them Malinovsky, Koniev, Voronov, Batov, and Meretskov. All reached four-star rank or higher, and later contributed much to the shaping, role, and employment of the armored forces of the Warsaw Pact.

As a result of their studies of the war, Soviet leadership at the time believed that their own military doctrine, strategy, and tactics were seriously deficient. Major changes were made in the Soviet Armed Forces, based on their Spanish experiences — changes that subsequently, during the Russo-Finnish War and World War II, often proved to be ill-advised or wrong.

### Organization and Structure

On July 18th, 1936, the day the state of war was officially declared, the Spanish Army's armored forces included two tank regiments, and a squadron of armored cars, the outdated tanks used at the only armor training center, the Central Gunnery School in Toledo, and various other armored vehicles in storage and considered unsuitable for combat operations. The standard battle tank was still the Renault FT-17, an obsolete model dating from World War I.

The Republican side had control of Tank Regiment 1, in Madrid, and the armored cars, and also controlled the Gunnery School and all depots. Almost without exception, this equipment was destroyed in combat between July and October 1936. The Nationalist forces, who moved into mainland Spain from Morocco, then a Spanish Protectorate, had no armor at all. Tank Regiment 2 in Zaragosa, in northeastern Spain, was loyal to the Nationalist side but the city was surrounded by Republican forces and, so it was employed only in defensive operations until late 1937.

After some armor was lost in combat, the Republicans attempted to provide the Army with improvised armored vehicles. Some armored cars were locally produced, generally with disastrous results.

Additional armored vehicles were imported under foreign aid programs, mainly from the Soviet Union, but also from France.

The first modern Soviet armor arrived at the Spanish naval base at Cartagena, on the southeastern coast, on October 15th, 1936 on board the Soviet vessel *Komsomol*. The shipment included 50 T-26B tanks and about 40 BA-6 armored cars for the Republican forces. The Soviet equipment came to Spain with full crews and auxiliary personnel, even though Spanish troops would also be trained to use the equipment. In contrast, the German equipment provided to the Nationalist forces was not operated by German crews, but was maintained by them as they trained Spanish crewmen to operate the vehicles.

The first Soviet tanks and armored cars came to Spain under command of Colonel Krivoshein, who had led the training department of the Soviet tank school at Olianovsky. The Germans knew immediately of the Soviet shipment because the unloading of the tanks was observed from a German Navy ship anchored at Cartagena harbor. (Germany was still officially a neutral country with effective diplomatic relations with the Spanish Republic.) The news of the ship's arrival was reported to Berlin and henceforth to General Franco, so the Nationalists knew very early about the arrival of the tanks and armored cars, and could begin to prepare to fight them.

Immediately after disembarking, Colonel Krivoshein established the main armor base and training center of the Republican Army at Archena, not far from Cartagena. He began training right away, recruiting mainly among truck and bus drivers from the cities of Madrid and Barcelona.

Nevertheless, before the end of the month, a reinforced tank company entered in combat against Nationalist forces South of Madrid, with all-Soviet crews and under Soviet command.

**Officers review an armored regiment of the Spanish Popular Army, which was equipped with T-26 tanks, at left, and Soviet-built armored cars, right.**

By the end of November 1936, the training center in Archena was under command of Soviet Major Greisser, Colonel Krivoshein's deputy. Colonel Krivoshein went to Alcala de Henares, a city 20 miles northwest of Madrid, where he started to organize a second training center for the Republican Army. At this stage of the war, the Republican Army had officially changed its name to Popular Army and added the red star to its uniform. The Nationalists never changed the original Spanish Army name, wearing neither swastikas nor fascist symbols on its uniforms.

With the first 50 T-26B tanks the Popular Army organized its first tank battalion, under command of Colonel Krivoshein, and started to organize a second battalion. Each battalion had three tank companies plus a headquarters company. Each company had ten tanks, with three platoons and three tanks per platoon. By mid-November 1936, two tank battalions were considered operational and were deployed for Madrid's defense, already threatened by General Franco's leading formations.

A month later, these two battalions were withdrawn from the front line for a major reorganization with more equipment that had arrived from the Soviet Union. Both Colonel Krivoshein and Major Greisser were called back to Russia. Krivoshein was later awarded the title of Hero of the Soviet Union for his participation in operations in the defense of Madrid. According to some sources, Greisser came under suspicion of conspiracy in one of Stalin's purges, and was shot. Other sources claim he died in the Volkhov sector of the Leningrad front early in 1943, fighting against the Germans and also against the Spanish volunteers of the Blue Division.

Krivoshein would later reappear as commanding officer of a Soviet armored brigade during the German invasion of Poland in September 1939. Later on, as a lieutenant general, Krivoshein commanded the III Mechanized Corps, one of the main Soviet armored formations destroyed during the very first moments of the Battle of Kursk, in July 1943.

By the end of 1936, the Soviets had delivered about 360 tanks to Spain. In command of all armored forces was Major General Pavlov, who had been commanding officer of the 1st Armored Division of the Soviet Army. (General Pavlov, nicknamed "Pablo" in Spain, would later be executed for negligence after failing to stem the German invasion of the Soviet Union in 1941.)

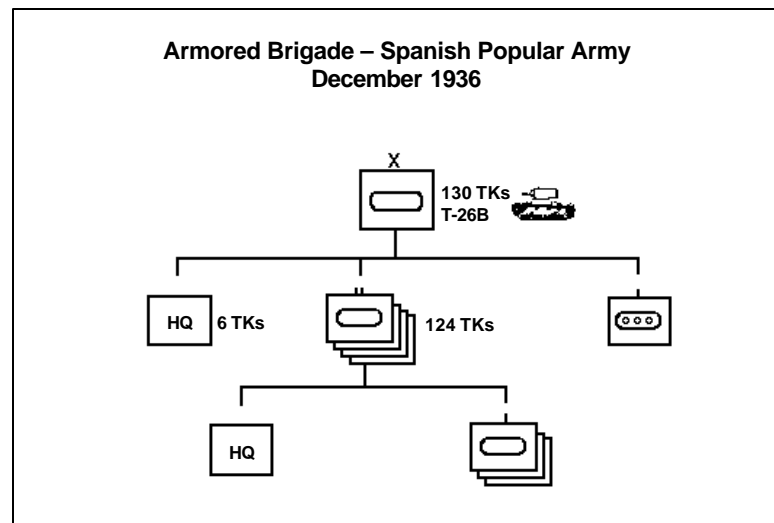
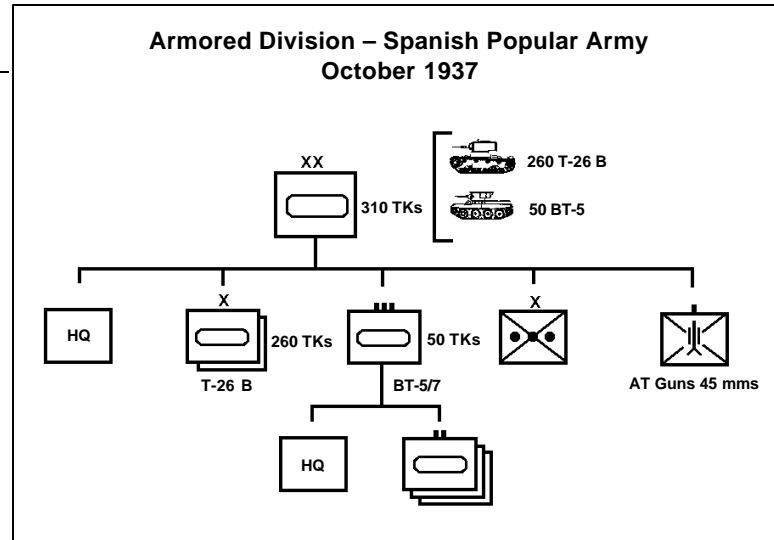
With the new tanks, General Pavlov created the 1st Armored Brigade of the Popular Army, the first major armored unit ever formed in Spain. The credit then for creating the first mobile force went to the Republican side. On the Nationalist side, Franco never employed anything larger than a battalion.

This first armored brigade included four tank battalions and a reconnaissance company mounted in wheeled armored cars. The brigade was actively employed at the battles of Jarama River and Guadalajara, during the first part of 1937, but it was limited to a defensive role, so it never achieved as much success as could be reasonably expected.

About 120 Soviet tanks were also delivered to northern Spanish ports. These were used to form the Northern Front Tank Regiment. This unit would be the first to be under command of a Spanish officer, Cavalry Lieutenant Colonel Anselmo Fantova. All these tanks were lost by October 1937, when the Northern front collapsed and the whole region was taken by the Nationalist forces. Most of these tanks were captured and put back into action, but this time with Nationalist crews.

During the first quarter of 1937, another batch of 300 Soviet tanks made possible the reorganization of the available armored force into two armored brigades, plus a light armored brigade with wheeled armored cars. The light armored brigade came under command of a Spanish officer, Colonel Enrique Navarro.

In addition, each of four Republican armies was assigned one independent tank battalion. So by mid-1937, the Popular Army had a total strength of 12 tank battalions, a force substantially superior



to the Nationalists, both in quantity and in technical quality.

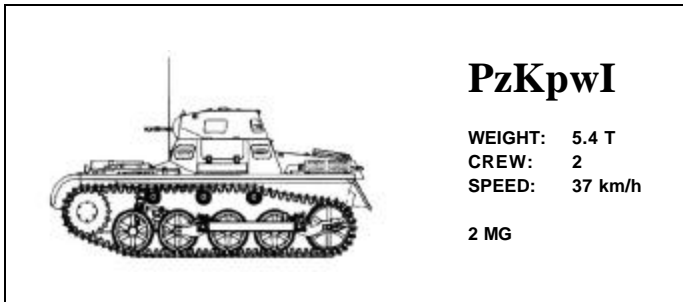
By the end of June 1937, General Pavlov had been replaced by Major General Rotmistrov, nicknamed "Rudolf" in Spain, who again reorganized the forces available, creating by the end of 1937 the first armored division of the Popular Army. This division integrated the two existing armored brigades, plus an independent tank regiment — as all Soviet armored divisions would do later on. The division was equipped with brand new BT-5 tanks received in August 1937. The division came under the command of Major General Sanchez Paredes, with General Rotmistrov acting as a kind of Inspector of Armored Troops at the Supreme HQ of the Republican Army.

The armored division of 1937 included two armored brigades, one motorized infantry brigade, one independent tank regiment, and one antitank company, equipped with towed 45mm antitank guns, plus combat and service support. In

spite of its apparent superiority, this unit failed to answer the tactical requirements of the Popular Army.

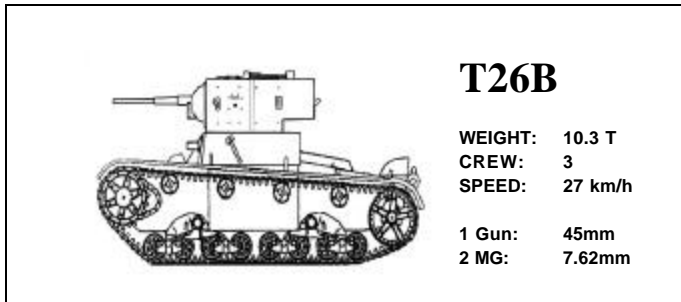
(General Rotmistrov later fought at the Battle of Kursk in the summer of 1943, commanding the Soviet Fifth Guards Army, with the rank of lieutenant-general. He opposed the powerful panzer forces of Colonel-General Hoth. His account of the impressive tank battles around the Prokhorovka hills remains among the best in modern Soviet military history. He ended the war as Marshal. His Guards Army had been one of the crack units, advancing inside Germany and reaching Berlin by April 1945.)

An additional 50 BT-5 tanks arrived from Odessa in August, 1937. They were organized into a tank regiment with Soviet crews, under the command of Colonel Kondriatev. By the end of the war in 1939, all but one of the BT-5s had been destroyed in combat. After the Spanish Civil War, the only surviving example was apparently presented as a trophy by



## PzKpwI

**WEIGHT:** 5.4 T  
**CREW:** 2  
**SPEED:** 37 km/h  
**2 MG**



## T26B

**WEIGHT:** 10.3 T  
**CREW:** 3  
**SPEED:** 27 km/h  
**1 Gun:** 45mm  
**2 MG:** 7.62mm

General Franco to Mussolini. It is today somewhere in Italy preserved in a military museum.

More tanks and wheeled armored cars were delivered to replace losses, and by mid-April 1938, the Popular Army managed to reorganize its armored forces again, creating two armored divisions. The First was assigned to Army Group East, located in Catalonia, and the Second, subordinated to Army Group Center, fought around Madrid under command of another Spanish officer, General Parra Alfaro. In total, these forces accounted for between 360 and 400 tanks, a considerable force.

After the summer of 1938, there are no records of any more tanks delivered to the Spanish Popular Army. Tank strength started to decline quickly, due to combat losses and the capture of equipment by the Nationalists. Nevertheless, the total number of tanks delivered by the Soviet Union between 1936 and 1938 was 900, of which about 600 were recovered and repaired by General Franco's forces. No less than 250 remained in service within the Spanish Army after the war, until the late 1940s and early '50s, when they were replaced by new M-24 Chaffees, M-41 Walkers, and M-47 Pattons supplied by the United States.

### Equipment

In 1933, the Soviet Army had six types of tanks in service: the T-26 for tank battalions of infantry divisions; BT-5 and BT-7 for mechanized cavalry; T-35 for heavy tank brigades; and amphibious T-37/T-38, and T-27 light tanks for recon and scout purposes. Of these, only the T-26 and BT-5 tanks saw service in Spain. All these tanks varied in firepower and mobility, but none offered protection against anything more than small arms — armor piercing bullets all round and heavy machine gun fire at the front.

The experience gained in Spain gave new impetus to tank design and to a point sparked some revolutionary thinking. During the period of the war, from 1936 to 1939, we saw the adoption of armor capable of keeping out shell splinters, the development of electric welding for armor plate, introduction of a special tank engine, the C2, which was a forerunner

for the engine of the T-34, and of new types of running gear, including the excellent Christie suspension, which was invented in the United States and adopted by the Soviet Union after all other tank-producing countries had rejected it. The intense activity of the second half of the Thirties culminated in the introduction, in 1940, of the T-34/76, an outstanding tank that could be considered the archetype of all successful tanks so far introduced, starting with the Wehrmacht's Panther, the British Centurion, the M60 series, certainly the Soviet T-54, and to a certain extent even the German Leopard 1.

As a general rule, Soviet tanks have distinguished themselves by their reliability in the field, their low unit cost, and their ease of manufacture. They have proved to be simple, robust vehicles, requiring a minimum of daily maintenance, and well suited to the average mechanically naive tank crewman, as was the case for both Russian and Spanish soldiers in 1936. Soviet tanks have been generally designed with a ruthless, no-frills philosophy that leaves them with a very rough-edged finish but without compromising any of their key performance requirements. The welding, for example, might have appeared crude, but it never compromised the level of protection. Exterior machining, too, seemed unfinished, except at key joints and interfaces where it was quite good.

The main battle tank of the Spanish Civil War was clearly the T-26; it was the most widely used and the most successful of any used by the warring parties. As was the case with many other Soviet tanks of the early 1930s, the T-26 was developed from a British design purchased from the Vickers-Armstrong company. As a matter of fact, it was commonly referred to as the "Vickers tank" by Spanish soldiers, rather than by its Soviet designation.

The Soviets built more than 12,000 vehicles of the T-26 series between 1931 and 1940, and at the time of the German invasion in 1941, it still formed the backbone of Soviet armored troops. The T-26 saw action not only in Spain and Russia but in Manchuria against the Japanese in 1939 and in the Russo-Finnish War in 1940. Against the Japanese, its weak-

nesses in armor were clearly revealed, and a newer version with improved armor was introduced.

Next to the T-26, the BT-5 fast tank was the other main battle tank also employed by the Soviets during the Spanish Civil War. The BT (Bistrokhodny Tank = Fast Tank) was derived from the American Christie design and was intended for large, independent, long-range armored and mechanized units. Originally, one of its basic attributes was its ability to run on either its tracks or its road wheels, but this advantage was never actually exploited by the Spanish Popular Army. As a matter of fact, the system proved unreliable, and due to mechanical failures and bad employment, all tanks of this type were lost by mid-1938 and never replaced. BT series tanks also saw service during the battles against the Japanese in Manchuria and during the Russo-Finnish War. They were employed during the early months after the German invasion in 1941, but they were obsolete by then, resulting in their total destruction by technically superior German forces. Nevertheless, the experience gained with the BT series was of great help to the designers of the T-34 later on.

The main armament of both the T-26 and BT-5 was the standard Soviet 45mm antitank gun M-1932/35, which fired an AP round with a muzzle velocity of 820m/sec. It also fired HE shells at a slower muzzle velocity in an arcing flight path.

As secondary armament, both types of tanks were armed with one coaxial DT machine gun of 7.62 x 54mm. Sometimes an additional machine gun was externally mounted for use by the tank commander. The T-26 carried 169 main gun rounds while the BT-5 carried 144.

Armor protection was certainly a weakness in both tanks. Maximum thickness was 15-16 mms of RHA, and its inadequacy led to some improvement. By 1940, the latest version of the T-26, the T-26C, had an equivalent of some 25 mms of RHA, but was still no match for almost any German antitank gun in service.

Combat weight was around 10 tons for the T-26B while the BT-5 was slightly



With a weight of only 10 tons, the T-26 could actually be carried on a heavy truck

This is one of the T-26s captured by the Nationalists during the civil war, but the photo was actually taken in 1945, when the vehicle was still in Spanish colonial service in Northern Africa!

supported by two Italian field artillery batteries equipped with 65mm light howitzers.

The Popular Army concept of maneuver was to conduct an encircling movement of the Nationalist advance guard, penetrate in depth against the bulk of Franco's forces and recover the main town of Toledo, located 40 miles SW of Madrid. The main effort was carried out by the First Infantry Brigade of the Popular Army, supported by the tank company team of Major Greisser (15 T-26B tanks). Soviet General Batov was in overall command of the operation, and artillery support was commanded by Soviet Colonel Voronov. It was the first action really undertaken by the Soviet military in Spain, and it clearly shows the involvement and commitment of the Soviet Union at such an early stage of the war. (General Batov was commander of the Soviet 65th Army in 1941, subordinated to Marshal Budenny. All his forces were destroyed by the Germans in the first battle for Kiev, and after that nothing more was heard of General Batov.)

While the concept of maneuver was appropriate and well planned, the execution was poor. The Soviets failed in their mission because they failed to back up the tanks with equally mobile infantry and artillery, and because fuel resupply broke down.

Early in the morning of October 29th, 1936, after the initial attack started by the Republican Air Force — also Soviet-equipped and led — the T-26 tanks began to move, taking advantage of the morning fog that is typical of the southern Castile plains during the early autumn. At first, they managed to penetrate the Nationalist forces' deployment, creating some confusion and disorder, but soon, lacking infantry support and liaison with higher echelons due to poor communications, the tanks were brought to a halt. It is not difficult to imagine the feelings of the Soviet tankers in the middle of Spain, facing a completely new environment, not understanding a single word of Spanish, likely without adequate maps and without liaison with their superiors. They must have felt completely lost.

Still advancing but without clear references, they came under direct fire of the

heavier, about 12 tons; nevertheless, when the Germans invaded the Soviet Union in 1941, the bulk of Soviet armored forces still fielded T-26 and BT tanks. It took some time until more heavily protected tanks like T-34s and KV-1s appeared within frontline units.

### Combat Operations

Soviet tanks first saw action in the Spanish Civil War on October 29th, 1936, when a tank company team led by Major Greisser met an advance guard detachment of General Franco's spearhead, then advancing at full strength towards Madrid.

The encounter took place about 25 miles southwest of Madrid, at the edge of the small town of Sesena. The outcome was disappointing for the Soviets and, in the end, served no purpose, apart from dra-

matically unveiling to the Nationalist forces the arrival of Soviet equipment and Soviet military "volunteers."

Franco's forces continued unhindered in their advance on the Spanish capital.

According to a witness who was then part of the Nationalist forces that took part in the encounter:

*The advancing Nationalist forces, under command of General Varela, had Madrid as their ultimate objective, and were composed of eight infantry brigades with the fire support of 23 field artillery batteries, but no tanks at all, except for a single light tank company equipped with Italian FIAT L3 tankettes armed only with machine guns, recently supplied by Italy to General Franco. The advance guard was a mounted cavalry brigade under command of Colonel Monasterio*



*howitzers attached to the Nationalist cavalry. One tank of the leading platoon was destroyed by a direct hit, and a second was damaged but managed to find a hull-down position from where it continued firing on the Nationalist forces. The third tank in the platoon started to withdraw from combat but committed the mistake of entering the narrow streets of Sesena where it was soon destroyed by the Nationalist cavalymen with the help of improvised "Molotov cocktails." The rest of the tank company disengaged from the action and retired towards the Republican lines, putting an end to the planned operation.*

*The second tank of the unfortunate leading Soviet platoon became immobilized in its hull-down position but continued firing on the Nationalist forces with undoubted resolution and courage, its crew rejecting all Nationalist attempts to destroy it. The Nationalist cavalry commander decided to commit the Italian L3 light tanks, but they proved completely inadequate and soon one was damaged, being overturned by a direct hit from the T-26. Miraculously, its crew escaped alive. Another Nationalist L3, a flame-thrower version, was totally destroyed and its crew killed, also by a direct hit. After 40 minutes, the Soviet tank was finally destroyed by a direct hit from a Spanish 75mm field howitzer, and its entire Soviet crew was killed. Thus, at their first action the Soviets failed in their mission and lost three tanks out of 15 committed, destroying in exchange two light Italian L3 tanks. Not a very bright start.*

Nevertheless, the action at Sesena had the effect of sounding the alarm among the Nationalist forces and convinced General Franco that Madrid was being defended with Soviet troops, both on land and from the air. But due to the failure of the Soviets in Sesena, Franco ordered his units to continue advancing towards Madrid. Not very soon afterwards, the Nationalists got proof that Sesena had been only the result of bad luck and some poor planning.

The Soviets lost about six more T-26 tanks in subsequent combats with the advancing Nationalist troops. The destroyed tanks were carefully examined and studied, and some of their main components were sent to Italy. Some of the experience obtained was used in developing the Italian M-13/40, a tank later employed in the North African campaign of 1941-1943 alongside the German Afrika Korps. On November 3d, 1936, the Nationalists captured the first Soviet T-26 tank, in almost mint condition. It was

recovered immediately and sent to the rear support services. It is interesting that the Germans offered the sum of 500 Spanish pesetas (about five dollars at today's rate of exchange!) for each T-26 tank captured intact. This reward, a clear proof of the German interest in Soviet equipment, attracted a lot of attention among colonial Nationalist troops, mostly of Moroccan origin, who on many occasions got killed in their efforts to capture the Soviet tanks at whatever cost.

In October 1936, almost at the same time as the initial Soviet tanks arrived, the first contingent of 33 German PzKpw I light tanks were shipped from Germany to General Franco. The tanks were under the supervision of Oberstleutnant Von Thoma, who later distinguished himself in WWII as a brilliant commander of the Afrika Korps and was captured by the British at El Alamein in November 1942. As mentioned earlier, German crews were sent to provide support services, and were not to engage in combat. By October 30th, panzers with Spanish crews were engaged in combat against Soviet armor at the outskirts of Madrid.

From the very beginning, Soviet gun-armed tanks were superior to German and Italian machine gun-armed light tanks. Nevertheless, during the first days of combat, the German Panzer Is equalized this disadvantage by using special armor-piercing ammunition whenever the Soviet tanks appeared. The Soviets quickly discovered that their tanks were being penetrated at ranges up to about 120 to 150 meters. Countermeasures against the ammunition used by the Nationalists were very simple and immediately applied: the Russian tanks no longer advanced to close the range. As soon as they noticed the panzers, they usually remained over 1,000 meters away, firing very accurately with their effective 45mm guns.

Another factor was that the gun sights in Russian tanks allowed targets to be engaged at up to 3,000 meters while sights on the Pak 37, the antitank gun supplied by the Germans to the Nationalist forces, were calibrated to only 900 meters. This forced the Nationalists to attach no less than five antitank guns to each light tank company to at least provide some protection against the Soviet guns. The effect was minimal; coordination of the new tanks and antitank guns proved extremely difficult for the Nationalists. In spite of all training, and to the dismay of the German instructors, the gunners normally started shooting at ranges far over 1,000 meters.

Soviet tank superiority was clearly shown in the combats around Madrid. By

the end of November 1936, the Nationalists had lost 28 Panzer Is plus several Italian L3s. This brought their efforts to a stalemate and forced them on to the defensive. At this point, the Popular Army made its main mistake, not going on the offensive.

Also, in the fighting around Madrid, the Nationalist forces first employed the 88mm antiaircraft gun in an antitank role, with great success. These guns, which were later developed into one of the most dreaded weapons of WWII, literally disintegrated the T-26s at the first hit. Luckily for the Soviets, the 88s were supplied to the Nationalists in very small numbers.

The front remained stabilized during the winter of 1936-37, but 1937 saw the employment of armor on a much bigger scale than in 1936. On February 13th, 1937, the Nationalist Army — in one more attempt to occupy Madrid — started an ambitious encircling maneuver from the southeast that led to the battle that has been called the Battle of Jarama. The campaign was pretty well described by Hemingway and perpetuated in many songs of the time, including some sung by Pete Seeger many years later. At the Battle of Jarama, the First Armored Brigade of the Popular Army, under the command of General Pavlov, managed to delay the advance of General Franco's troops precisely at the Jarama River, but as happened in Sesena, the Soviet tanks acted without infantry support and remained in a defensive attitude, not exploiting their success and technical capabilities. The Soviets lost 24 T-26s destroyed and captured against 17 Panzer Is destroyed and damaged.

At dawn on March 8th, 1937, ten field artillery battalions of the Italian expeditionary force opened fire on the lightly defended positions of the 12th Infantry Division of the Popular Army, which barred the avenues of approach to Madrid from the northeast. The battle for Guadalajara had started. Four motorized infantry divisions of the Italian Volunteer Corps attacked on a broad front. One of them was an elite division of the Italian regular Army, the "Littorio" Infantry Division under command of Major General Bergonzoli, who had served previously in the Ethiopian campaign under Marshal Graziani. The division acquitted itself very well later on in North Africa under Field Marshal Rommel, although it was ultimately defeated and annihilated by the British Eighth Army. The Italians committed a total of 35,000 men to the fight at Guadalajara, but armor was scarce, limited to a reinforced battalion-strength unit of FIAT L3 light tankettes.

The objective of the Italian High Command was to take the cities of Guadalajara and Alcala, the latter only 20 miles from Madrid. They hoped the Republican forces would crumble, Madrid would be occupied, and a quick surrender would follow, bringing an end to the war. Such a victory would have been of immense propaganda benefit to the Italian Fascists, and would establish the claim of Mussolini's regime to leadership in Southern Europe. But the Italians made several mistakes: first, they underestimated the ability of the Popular Army and did not take into account the Soviet presence and reinforcements around Madrid. Secondly, they disregarded the weather forecasts, perhaps thinking that Spain was as sunny as the tourist brochures advertised. And they failed to do adequate terrain reconnaissance. The results were a disaster for the Italian forces, and the Nationalist forces as a whole. But even today, it is impossible to understand why the Popular Army and the Soviet forces never exploited their success.

The Italian attack began in the midst of a severe windstorm, freezing temperatures, and heavy snow. They were limited to a visibility of only 2 to 3 meters! Somehow, they managed to penetrate about 15 miles into the Republican deployment. Weather conditions did not permit the air support planned, which was to come from the entire Italian expeditionary air forces in Spain, some units of the German Luftwaffe's Condor Legion, and the Spanish Air Force. They were unable to take off to support the ground forces because of the weather. After two days, the Popular Army had managed to reorganize their front and stop the Italian offensive. The key to this was the employment of Pavlov's First Armored Brigade and the air support provided by Spanish Republican and Soviet aircraft who flew in from airfields that were not affected by the weather around Madrid.

The Italian casualties included 1,400 dead, 4,500 wounded, and 500 missing in action. While losses on the Republican side were even higher, the Italians were forced to withdraw to their original line of departure. But incredibly, the Popular Army that had done such a brilliant job of coordinating air support, artillery, tanks and infantry on the defense, lacked offensive spirit, and never exploited its success. This allowed the Littorio Division to make a neat and tidy withdrawal. Guadalajara, a defeat for the Nationalist forces, delivered a severe blow to Italian prestige, but never amounted to a real success for the Popular Army. The most impor-



tant strategic consequence of the battle was the abandonment of the Nationalist goal of conquering Madrid; the capital city remained in Republican hands until the end of the war, on April 1st, 1939.

Armor losses in the battle for Guadalajara were extremely moderate: the Soviets lost only seven T-26 tanks and the Italians 19 FIAT L3s.

The summer of 1937 brought one of the bloodiest battles of the Spanish Civil War: the Battle of Brunete. Brunete is a small town about 15 miles northwest of Madrid, and by mid-1937, it appeared to the Popular Army high command as a convenient spot to create a diversionary offensive. They hoped to attract the attention of General Franco and alleviate the pressure of Nationalist forces in Northern Spain, then committed to the conquest and occupation of the entire Basque region. The initial planning and full concept of the operation of the Brunete offensive is today attributed to the late Soviet Marshal Malinovsky.

On July 5th, 1937, three Army corps, supported by 250 artillery pieces and 300 aircraft, began an offensive against Franco's six divisions around Madrid. The attacking force, 125,000 men with 130 tanks, was the largest military force ever assembled in Spain. It faced a Nationalist force of 50,000 men and 50 light tanks. At first, the Republican forces managed to advance and penetrate between 10 to 15 miles inside the Nationalist lines but again, they moved with utmost caution, showing a lack of audacity and initiative. Their hesitancy allowed the Nationalists to react in strength. By July 7th, the Battle of Brunete had transformed itself into a battle of attrition. In this battle, General Franco maintained a good grasp of the situation and his logistics, repeatedly moving the Nationalist reserves to the right spot at the right time.

**The Christie suspensions of the Soviet BT-5s were capable of running on both wheels and tracks. This one is in the wheeled configuration, which did not prove to be useful in the Spanish conflict.**

The Battle of Brunete was called the "Battle for Thirst" because very hot summer weather played havoc with troops on both sides. Temperatures reached 102 degrees. By July 12th, the Republicans stopped the attack and assumed the defensive, trying to consolidate its lines.

In the skies over Brunete, the German Luftwaffe employed for the very first time Messerschmitt Me-109 fighters, Heinkel He-111 bombers, and Junkers Ju-87 Stuka dive-bombers that swept the once powerful Soviet-Spanish Republican Air Force from the sky. In total, the Republican forces lost near 30,000 dead and 61 T-26 tanks destroyed and captured while the Nationalists lost 20,000 dead and only two light tanks.

Armor had been very badly employed on the Soviet side. Tank units were broken up, and the individual tanks were employed like assault guns to provide fire support. A lack of initiative, combined with inability to exploit their initial success, led the Popular Army to a major disaster. Although at a much different scale, we can compare Brunete with Kursk. After Brunete, the Popular Army was never again a coherent force capable of matching the Nationalists. From that stage of the conflict, their superior armored forces were unable to present a real threat to the technically inferior armored forces of General Franco. By the last days of the battle, the Nationalists even dared to employ for the first time their captured T-26 tanks, a fully operational company-size unit of 16 tanks, but

they also employed their tanks in an infantry support role.

After Brunete, the Popular Army never employed its armored units to their full advantage, and never capitalized on the major armored units they had created. In October 1937, while trying to create another diversionary effort to alleviate the Nationalist pressure on all fronts, the Popular Army attacked in southern Aragon, employing there for the first time the heavy tank regiment that had been recently organized with the newly arrived BT-5 tanks.

The BT-5 tanks tried to take advantage of their speed and, to benefit from infantry support, also carried on their decks a full squad of infantrymen in the style later employed by the Soviets on the Eastern Front. Many of these infantrymen were killed by the combined fire of all weapons, but especially artillery. The tanks also lost the advantage of their speed when they got bogged down in an area of marshes and muddy soil near the small town of Fuentes de Ebro. The result was loss of 29 BT-5 tanks out of the 61 committed. The Nationalists succeeded because of well established fire planning and good employment of well positioned and well camouflaged antitank guns. The graveyard of wrecked BT-5 tanks was left in place for a long time afterward, and was shown frequently to the international media as a clear example of the extent of the Soviet intervention in Spain.

Tanks continued to be employed until the end of the war in a secondary role, mainly providing infantry support as mobile assault artillery. Generally speaking, the Popular Army assigned one tank battalion to each infantry division and to each army corps. Their armored brigades and divisions were never employed as such, and the war devolved into a series of infantry battles. The Nationalists also employed their armor mainly in support of infantry.

The main and final battle of attrition of the war began on July 24th, 1938, near the river Ebro. Armored units didn't play a key role in the four month battle, and when it was over, the Popular Army had ceased to exist as an organized combat force. From December 1938 until April 1939, the Republican forces were only capable of conducting a disorganized defense that ultimately resulted in their unconditional surrender and the end of the Second Spanish Republic.

### Conclusions and Remarks

According to reports sent to Germany by Oberstleutnant Von Thoma, the experience obtained by the Germans from

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*On the Soviet side, the mistakes made by the combined Soviet-Spanish leadership were not correctly understood. This led to the disbanding of existing large armored formations in Russia, which proved disastrous in 1941.*

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the Spanish Civil War ultimately helped them in speeding up the production of gun-armed tanks, especially the Panzer III and IV types, but the misleading results of the Nationalist victory probably gave them some false reassurance. When the invasion of Russia began, the bulk of the German armored force tanks were of the PzKpw I and II types. Only their PzKpw IV, with its 75mm gun, was at all capable of matching the soon-to-be-introduced T-34 and KV-I Soviet tanks.

Other conclusions about tanks were drawn by foreign observers, among them the British theoretician J.F.C. Fuller, who drew the lesson that light tanks were inadequate: *"The three types of tanks that I have seen in Spain — Italian, German, and Russian — are not the result of tactical study, but are merely cheap mass production. From the standpoint of mechanization, up to now this war has proven my opinion that the light tank is absolutely no combat machine."* Instead, Fuller advocated gun-armed tanks with full protection and high reliability.

The following major conclusions were also reached as a result of major operations during the war:

- Tanks need to be supported by motorized infantry. Failing to do that caused many of the Soviet mistakes. Only in rare cases, or against limited objectives, should tanks proceed alone.
- The speed of tanks complicated command and control and made timely assessments of a situation more difficult.
- A great advantage accrued to close cooperation with aircraft, which could aid command and control, provide combat support, and perform reconnaissance.

Sir Basil Liddell-Hart made some interesting comments about the employment of armor in the Spanish Civil War in his book, *Europe in Arms*. He said it was a great mistake to consider the war as proof of the inefficiency of mechanized forces. On the contrary, mechanized troops proved that they could move cross-country and across a wide front and that when employed in such a way they contributed a great deal to the achievement of success. They could also contribute to a defensive situation, he said, arguing that the mobile defense was more effective than a static, strongpoint defense.

Von Thoma noted that General Franco, as a typical general of the old school, always wanted to distribute his available tanks among infantry units. But most of the Nationalist victories, Van Thoma said, happened when tanks were employed in larger numbers. Franco and Von Thoma remained at odds on this issue, prompting Van Thoma to comment: "The Spaniards learned quickly, but also forgot quickly."

On the Soviet side, the mistakes made by the combined Soviet-Spanish leadership were not correctly understood. This led to the disbanding of existing large armored formations in Russia, which proved disastrous in 1941. The superiority of their equipment in the Spanish conflict also made the Soviets overconfident, and this dangerous peace of mind led to disaster in 1941, at least until the T-34 was introduced in sufficient numbers.

The Soviets also never understood the importance of close cooperation between air support and armor, nor the key role of mechanized infantry working together with tanks. But their solution to the organization of armored units proved more efficient and persists today — three tanks per platoon, ten tanks per company, thirty tanks in a regiment, and one independent tank regiment per division.

Not much has been written on the employment of armor during the Spanish Civil War. Certainly, in comparison with what happened in World War II, it is easy to overlook, but it certainly was in its way a foreword to what was coming, and many of the lessons learned just confirm what we know today as key principles of armored warfare.

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ideal of mechanized mobility, bought time for Madrid's defenders and contributed to a strategically significant result; the capital remained in Republican hands until the war's final campaign well over two years later.

Balanced assessments of armored warfare in the Spanish war — particularly that war's opening phase — are rarely seen; works that focus on World War II or encompass the entire history of the tank either avoid this subject altogether or treat it cursorily — as a prologue to more significant events. A more detailed examination of tank employment in Spain is therefore necessary. The first problem encountered in such an examination is the historiographical one mentioned above. The “laboratory” and “false start” schools were both conceived to explain military disasters of 1940 and 1941, rather than those of the Spanish conflict, and the evidence was duly cooked. Only when these after-the-fact rationalizations are stripped away does the true picture emerge: the experimenters were far less sure of themselves than is often supposed. Both sides addressed the promise of independent mechanized operations, but had done so fitfully and with reservations. So, too, did both sides employ recently designed tanks only to find that those tanks were not always ideally suited for the missions they performed. Training was difficult and, even when successful, could not always atone for limitations of doctrine and technology.

### Hindsight or History?

Conditions in a laboratory can be controlled, and it is extraordinary that a combat veteran would liken a war zone to one. But Ferdinand O. Miksche did precisely that. Miksche, a Czech artillery officer who commanded an artillery group in the Spanish Republic's *Ejército Popular*, was the first to propose that the “Spanish Laboratory,” as he called it, was ideal for the testing of mechanized tactics.<sup>2</sup> “The pace was slower and the scale was smaller” than that of later operations in Poland, France, and North Africa, he reasoned. Written in the aftermath of the French army's 1940 collapse, Miksche's *Attack: A Study of Blitzkrieg Tactics* was a resounding I-told-you-so which treated the operations of the German *Imker Drohne* advisory group operating with Franco's Nationalists as unqualified successes. “The road that the evolution of war was taking could not fail to be seen by an attentive observer who studied it in Spain,” lamented Miksche in his introduction, and the French clearly were not paying attention. Only the Germans “learned...that war had changed” and

Heinz Guderian's armored drive to the mouth of the Somme was proof enough of that. Tellingly, Miksche did not see the Soviet tank officers operating on his own side as innovators, but regarded them instead as slaves to the same antiquated tactical conception as that of the French. Republican tanks in 1937, like French tanks in 1940, were largely infantry support weapons, parceled out to line units in small groups, rather than concentrated for effective offensive or counter-offensive actions.

As is so often the case with such pointed theses, this one was oversimplified. In 1939, Miksche had attempted to warn Western military authorities that Guderian's *schwerpunkt*, or thrust point, tactics were indeed viable. The warning had been taken lightly, and Miksche's selection of historical evidence for *Attack* was correspondingly tendentious. He ignored even more concerted — and earlier — Soviet attempts at tactical reform, especially those of the first two senior tank officers in Republican Spain: Lieutenant-Colonel Semyon M. Krivoshein and his successor, Major-General Dmitri G. Pavlov. Not only did the Soviet field regulations of 1936 deem independent mechanized operations necessary, but their rejection over the next three years had little to do with tactical failures in Spain; Mikhail N. Tukhachevsky, their chief proponent, was executed for espionage and treason in June of 1937. Nor did Miksche note that, by February 1937 — scarcely four months after their arrival — the *panzer* crews of Wilhelm Ritter von Thoma's *Imker Drohne* group had been repeatedly ordered to avoid enemy tanks.<sup>3</sup> Not until early 1939 were those *panzers* committed under Spanish command to a war-winning offensive. Nevertheless, Miksche's glowing assessment of the *Wehrmacht*'s “Spanish Laboratory” was taken at face value by a generation of *blitzkrieg* victims in search of an explanation.

The seeds of the historiographical counterpoise to Miksche were sewn in June, 1941, when the Soviet West Front, under the command of Dmitri Pavlov, collapsed. This collapse resulted partly from the misapplication of conclusions that Pavlov had formulated while serving in Spain. Frustrated with the failure of independent armored operations there, and knowing that Tukhachevsky had incurred Stalin's wrath, Pavlov convinced the People's Commissariat for Defense in July 1938 that tanks were suited only to the close support of infantry formations.<sup>4</sup> He had also replaced Tukhachevsky as his army's senior tank officer, and his views held official credibility on that

account as well. In July 1939, the four Soviet armored corps were disbanded, and the brigades of their component divisions were distributed among infantry divisions. For Miksche, Pavlov's 1941 defeat indicated that the Soviets, like the French, had neither learned from the Spanish experience nor heeded the findings of those who had.<sup>5</sup> However, when German accounts became available after World War II, a different picture emerged. Thoma spoke not of a perfect laboratory, but of practical limitations which rendered effective mechanized experimentation impossible. Similarly, Guderian believed contemporary developments in Germany to be much more important. A bizarre byproduct of this interpretation was the partial rehabilitation of Pavlov — from moron to ignoramus: He failed on the West Front because he could not possibly have learned anything of value in Spain anyway. More important was the historiographical effect wielded by the Allies' reversal of their earlier fortunes. Just as the *blitzkrieg*'s victims sought an explanation for its short term success, its designers now grasped at any opportunity to account for its ultimate failure.

### Imported Theories: A Common Thread

German doctrinal reform of 1926-1937 paralleled its Soviet counterpart in content as well as timing, although the similarities were to be obscured by comparisons of the *blitzkrieg*'s success to Pavlov's 1941 failures. Before Tukhachevsky's downfall, however, the mutual affinity of Soviet theorists and their “bourgeois” German contemporaries was strong. That affinity had been fostered during the 1920s by joint military exercises conducted under a secret provision of the Rapallo Pact. During those exercises, Tukhachevsky studied the reform initiatives of Hans von Seeckt. As chief of the *Reichswehr*'s troop bureau and de facto Chief of Staff from 1920 until his death in 1926 Seeckt argued that, contrary to the apparent lessons of the recent World War, the defense was not inherently superior: “Science,” he observed, “works for both sides.”<sup>6</sup> Although inclined toward small mobile forces, Seeckt, like Tukhachevsky, held that, even with their mechanical limitations, vehicles held significant advantages over men. Guderian also considered Tukhachevsky's work carefully: “[T]here is something to be said for the way the Russians have organized their [tank] forces,” he later noted. But this approval was conditional; the Soviet demand for immediate infantry support, long range artillery support, and independent tanks required

“a whole inventory of specialized tanks, with all the attendant disadvantages.”<sup>7</sup>

Guderian intended that the tank fulfill its potential for concentrated independent action against the thrust point, but continued to address the need for cooperation with non-mechanized infantry. Inherent in this compromise were two equally weighted reservations. On the one hand, he criticized those who sought to limit tanks to the infantry support role as prone to underestimate the tank’s firepower while overestimating that of equally untested antitank guns:

*It is alleged that the defense will no longer be susceptible to surprise by tanks; [that] antitank guns and artillery always find their mark, regardless of their own casualties, of smoke, fog, trees, or other obstacles and ground contours; the defense too, is always located exactly where the tanks are going to attack; with their powerful binoculars, they can easily see through smoke screens and darkness, and despite their steel helmets they can hear every word that is said.*<sup>8</sup>

On the other hand, he warned:

*[A]s with all innovations in the field of military technology, it is unwise to jump to conclusions before undertaking a serious examination of the pros and cons of new forces and the necessary counter-measures. Otherwise, there will be some painful surprises in store when it comes to real combat.*<sup>9</sup>

Like Tukhachevsky, Guderian had surmised that coordinating with muscle-powered infantry did not necessarily mean co-locating with it in all situations. However, Guderian was far more determined that the new tactical guidance be more adaptable than the old. Local commanders — not field regulations — should determine the direction and formation of an assault because those decisions depended ultimately upon the composition of the attacking force, enemy dispositions, and terrain. Tanks should precede infantry in exposed areas, follow infantry where sufficient engineer and artillery support was available, and attack the infantry’s objective from a different direction if the terrain allowed.<sup>10</sup> This demand for flexibility, rather than the simultaneous demand for an independent mechanized capability, distinguished the German guidance from its Soviet counterpart.

But even Guderian expected that tactical flexibility would be circumscribed by technology, organization, and training. Where technology was concerned, different missions called for different tank types: The close support variant needed much armor protection, but only light

armament: “a modicum of defense against enemy tanks.”<sup>11</sup> Conversely, the exploitation-and-pursuit mission demanded a sacrifice of some armor in the interests of speed and, especially, firepower. Well before the Spanish Civil War, Guderian specified a main gun of up to 75mm because he regarded future tank-versus-tank combat as an absolute certainty. As for organization, infantry support tanks would operate in small detachments whereas independent mechanized action called for large formations composed of tanks and lightly armored infantry carriers. Each type of formation required specialized training. Tank officers detailed for infantry support were *de facto* advisors to infantry commanders, rather than unit commanders in their own right. In contrast, those leading exploitations were dictating the course of events and therefore required command, as well as technical, training. Only when employed in the independent role could tanks contribute directly to a long term, strategically significant result. By 1936, Guderian’s superiors were intent on putting this theory, as well as their tanks, to the test. Thoma later hinted, a bit defensively, that Spain’s role as a “European Aldershot” had been designated at higher levels of command than his own.<sup>12</sup>

Unlike the Germans, who practiced armored warfare in secret because the Versailles Treaty had prohibited their possession of tanks, the Soviets suffered more from limitations of domestic origin. When appointed as Army Chief of Staff in 1925, Tukhachevsky inherited an organization in which tactical and technological modernization had been thwarted, not only by the lack of a viable automotive industry, but by the then prevailing interpretation of Marxist-Leninist dogma. Leon Trotsky, the People’s Commissar for Military Affairs until 1923, had favored large, semi-trained militias as the only true military expression of proletarian revolutionary zeal. His successor, Mikhail V. Frunze, allowed that even violent political revolution was to be effected by bourgeois military methods, but Frunze’s premature death in 1925 left some ramifications of this reinterpretation unclear.<sup>13</sup> Although official support for modernization had taken hold by the first Five Year Plan’s initiation in 1927, the first and second priorities went to infantry and artillery, respectively. Thus, although the Revolutionary Military Council’s Summer 1929 *Preliminary Correct Line for the War Doctrine of Tanks* reflected the Party’s desire for both new armored forces and the motorization of extant maneuver arms — infantry and cavalry — the first stage of that policy’s implementation took another two years.<sup>14</sup>

The most significant advances, both tactically and technologically, occurred during Tukhachevsky’s tenures as Director of Armaments (1931-1934) and as a Director of the Military Soviet (1934-1937). The Soviet Army’s 1932 *Combat Regulations for Mechanized Forces*, which also reflected the influence of Tukhachevsky’s former Deputy Chief of Staff, Vladimir K. Triandafillov, served as a starting point for both tank design and employment. Under this policy, each of three distinct tank missions was assigned its own purpose-built tank, and the likelihood of overlap between one category and the next was generally minimized. Light tanks grouped into *N[ieposredstvennoy] P[odierzhki] P[iechotiy]*, or short range infantry support formations, were to supply direct support to conventional infantry formations operating against the enemy’s front lines. Infantry support against successive defensive belts between 1.5 and 2.5 kilometers from the line of departure was to be provided by heavy tanks of the *D[alshiy] P[odierzhki] P[iechotiy]*, or long range infantry support formations. Lastly, independent mechanized operations against enemy headquarters, reserve, and artillery elements were the province of the *D[alnogo] D[ieystviya]*, or long range operation group, equipped with *B[ystrochodny] T[anki]*, or fast tanks.<sup>15</sup>

In the 1932-3 expositions of this three-tiered concept, infantry support tanks outnumbered the fast tanks at least partly because the latter represented a controversial and untested departure from linear tactics. If the fast tanks could indeed exploit gaps created by the other formations, the extent of those exploitations was open to question, and the guidance for DD groups, the *Preliminary Instructions for Waging Deep Battle*, did not gain official approval until 1935. Tukhachevsky continued to test the concept intensively and, although the next doctrinal revision retained the infantry support and independent functions outlined in 1932, the exploitation was now receiving as much attention as the breakthrough. According to the Provisional Field Service Regulations of 1936, *P[olevoy] U[stav]-36*, a decisive victory could only be achieved by offensive action in depth. But Tukhachevsky and his followers also noted a caveat which applied especially to technologically sophisticated forces such as the DD group:

*It is impossible to be equally strong everywhere. To guarantee success, troops and war material must be deployed in such a way that superiority is obtained at the decisive points. On sectors of secondary importance, all that is necessary is*

the employment of sufficient forces to hold the enemy.<sup>16</sup>

This emphasis on concentration against decisive points was a direct reflection of Tukhachevsky's familiarity with "bourgeois" tactical theories; theories whose acceptance in the Soviet Union stemmed partly from the fact that a now out-of-favor Trotsky had earlier dismissed them. More specifically, it was a common denominator shared with Guderian's *Schwerpunkt und Aufrollen* conception of mechanized warfare. So, too, was *PU-36*'s demand for cooperation of all combat arms and the employment of each "under the conditions most favorable for developing its possibilities to the fullest extent." However, although Soviet doctrine of the 1930s often expressed the same general principles as its German counterpart, it also retained elements of the earlier, non-Western fixation on mass: Even though *PU-36* urged offensive action "throughout the whole depth of [the enemy's] position" for an attacker who could not be "equally strong everywhere," it added with equal conviction that "the simultaneous defeat of the enemy along the whole of his battlefield" was technologically possible.<sup>17</sup> Calling the previous generation's linear tactics into question, *PU-36* had thus retained at least some of that generation's linear orientation, especially where the use of massed artillery and air support at higher operational levels was concerned. This duality had no direct German equivalent, and probably stemmed from Tukhachevsky's own knowledge of the fast tank's limitations; knowledge which had been gained since 1932. Although fast tanks had been designed to destroy the enemy's artillery and prevent the concerted action of his reserves, redundancy in the form of massive indirect fire support would help preserve the "harmonic" aspect of combined arms offensives.<sup>18</sup>

Krivoshein's selection as the first commander of Soviet tank forces in Spain stems as much from his fundamental agreement with Tukhachevsky's conception of future wars as from his command experience in field training exercises of the early 1930s. Conceding that the infantry support mission was still relevant, Krivoshein had increasingly viewed the tank as "a very important instrument of pursuit," a view which he still held in October 1936, when his advisory detachment deployed to Spain.<sup>19</sup>

### Imported Tanks: The Soviet Advantage

When the first shipment of Soviet tanks arrived at Cartagena on 16 October 1936, the tactics to which Krivoshein had



committed were yet in a state of transition. Official acceptance of *PU-36* was over two months away and would be temporary in any case. And although Krivoshein himself adhered to the principles of Deep Battle, his tankers came from different units, some of which had trained only for close support operations. In the following weeks, as the detachment's cadre began to select and train Spanish Republican *tanquistas*, it also learned.

Soviet tank design, like Soviet tactics, reflected a need for both independent and infantry support missions. The 50 tanks unloaded at Cartagena belonged to the T-26 series, originally designed for the latter. These equipped the first four Republican tank battalions to be organized. The fifth battalion, and several subsequent ones, used the BT-5, a vehicle intended solely for independent mechanized operations. Not only did subsequent events in Spain suggest that this strict division of responsibilities was far less sound in practice than in theory, but the two tanks were remarkably similar in terms of armor and armament. The T-26 series was a direct descendant of the British Vickers "six-ton," 15 of which had been purchased on Tukhachevsky's order in 1931. Originally equipped with dual side-by-side turrets, subsequent variants, including the later T-26B1s, mounted a single hull-width turret housing a 45mm main gun and coaxial 7.62mm machine gun. The new main armament, although effective against machine gun emplace-

**The Soviet T-26B was the most common tank on the Republican side, and clearly out-classed the German and Italian armor employed by the Nationalists.**

ments, was the same as that carried by the BT-5, and the T-26's top speed of 23 miles far exceeded that of a walking infantryman. Like its British precursor, the T-26B1 carried the designation light tank, but was over three tons heavier and embodied a number of added design features which in retrospect make doctrinal distinctions between it and the fast tank appear artificial. The periscopic sight featured Zeiss optics, and many later models came equipped with a photoelectric firing circuit, which enabled gunners to engage moving targets more easily — when it was working. Radios were equally important in wide-ranging tactically independent operations, and most early T-26s carried them as well.<sup>20</sup>

The BT-5 also evolved from a foreign prototype tested at Tukhachevsky's behest in 1931. This was J. Walter Christie's T-3 design: a model that American ordnance experts had rejected. Like the T-26A, the first production BTs mounted machine guns only, but the same 45mm gun was added soon thereafter. The BT-5's frontal armor was 13mm thick, as opposed to 15mm for the T-26, and it weighed in at 11.2 tons combat loaded — less than two tons more than its stable mate. Also suggestive of accidental doctrinal overlap are officially dif-



ferent roles is the retention of the T-26B1 turret — with its infantry handrail — on BT-5s. Only the BT-5's top speed under ideal conditions — 36 miles per hour — set it apart from the T-26B1 but, because conditions in Spain were seldom ideal, the extra 13 miles per hour was rarely attained.<sup>21</sup> Moreover, not even devotees of independent mechanized action always agreed on the need for speed. B.H. Liddell Hart, for example, argued that the BT's high power-to-weight ratio did not make for accurate gunnery, and his argument was, to a large extent, borne out: When reporting on his first few tank operations in Spain, Krivoshein emphasized that most effective large caliber gunnery occurred from the halt, and that effective coordination of tanks and infantry was the tactical ingredient most sorely lacking.<sup>22</sup> One reason for this deficiency was the three-man crew. Because the gunner doubled as tank commander, simultaneous firing and communication with supported elements was impossible.

The implicit message from the Madrid Front between October 1936 and March 1937 was clear: whatever promise independent mechanized action held at the operational and strategic levels, frequent combined arms operations involving tanks and dismounted infantry were to be expected regardless of the larger scenario. The corollary, of course, was that local conditions might require light infantry support tanks to participate in fast tank operations and, by late 1937, infantrymen were riding into combat on both types. Not surprisingly, post-1939 BTs and their more famous successors, the T-34s, retained both reasonable degrees of speed and infantry rails. These two features underscore the stark disparity between an overly complicated peacetime theory and its less elaborate wartime expression.

Germany's first mass production tank reflected less of Guderian's tactical philosophy. The *Panzerkampfwagen* Mark IA had begun in 1932 as a prototype for an armored anti-aircraft gun carriage rather than a tank. Only during the next two years, as Guderian's theories were gaining acceptance, was a tank turret added, but that improvement came at a cost: Although roofed and capable of 360-degree traverse, the new turret mounted two 7.92mm machine guns, rather than the original 20mm AA weapon. Smaller weapons meant more ammunition and, because the resulting hybrid was intended primarily for training purposes, this increase was deemed far more important than the simultaneous loss of firepower. The Mark IA weighed 5.4 tons, had frontal armor of 15mm, and carried a basic load of 1,525 rounds.

Considerably smaller than its Soviet counterparts, it was limited to a crew of two: a driver and a gunner/commander who also served as the loader.<sup>23</sup> Well before 25 August 1936, when the first shipment of Mark Is reached Nationalist forces, larger purpose-built medium tanks were on German drawing boards, but none were available for Thoma. As a result, *Imker Drohne* tank crews stood no chance in tank-versus-tank combat against Republican opponents.

### Training the *Tanquistas*

The subsequent showdown on the Madrid Front (Central Front was the Republican designation) also introduced an element of default over the next five months: when armored exploitations proved impractical, the consequent pressure on conventional infantry formations was likely to increase the number of requests for tanks in the close, direct fire support role. And these requests usually originated among infantrymen who could not have cared that theorists had intended at least some of those tanks for other missions. Guderian and Tukhachevsky both preferred larger, domestic maneuvers, and each viewed his nation's military involvement in Spain as a dubious, politically motivated venture.<sup>24</sup> However, matters were now beyond their control and, when committed to combat, general theories would be of little use without specific modifications. Those modifications, made by both advisory groups, sometimes contravened official guidance but were made nevertheless. Miksche's overstated, hindsight-oriented comparisons of Soviet stagnation and German innovation say little of this bottom-to-top phase of doctrinal formulation. So, too, do those comparisons belie the fact that Soviet officers far more attuned to the tank's operational potential than Pavlov — Konev, Rokossovsky, and Malinovsky, for example — adopted small unit infantry support tactics in Spain when necessary. Forearmed more with ideas than experiences, Krivoshein and Thoma collided with the Clausewitzian concept of friction as much as with each other: the theories were simple enough, but putting them into practice was another issue.

In Spain, a good deal of the friction occurred before combat. For Thoma, the situation was defined by Franco's initial failure to take Madrid. On 30 October 1936, Admiral Wilhelm Canaris of German military intelligence complained to Franco that Spanish battle tactics were not "promising of success" and that, due to the rebels' misuse of air power in small disjointed operations, many early advantages had gone unexploited.<sup>25</sup> From that

point forward, German forces were to be commanded by Germans, and German equipment was not to be used without German advice. Faced with an opponent who was also receiving outside assistance, Franco had no choice but to comply, and this compliance was to be effected even at the lowest levels of command. Spanish tankers were to learn from German instructors.

Thoma, who had personally arranged the armored assistance with Franco back in July, did not return to Spain until the August shipment of Mark Is, operated by scarcely trained Spanish crews, had already seen combat. He agreed with Canaris on the importance of training, but his initial calls for both German and Spanish volunteers fell far short of expectations. With less than 150 Germans in its initial complement and only around 600 when it reached maximum strength in 1938, *Imker Drohne* was a skeleton to be fleshed out by Spanish crewmen. Tank crews were integrated where possible, but the language barrier remained significant. Frustrated that the Spanish trainees were "quick to learn" but "also quick to forget" how to operate tanks, Thoma was equally disappointed with the Nationalist leadership's willful rejection of the *Schwerpunkt* tactics he sought to test:

*General Franco wished to parcel out the tanks among the infantry — in the usual way of generals who belong to the old school. I had to fight this tendency constantly in the endeavor to use the tanks in a concentrated way. The Francoists' success was largely due to this.*<sup>26</sup>

On the other hand, the capacity of Thoma's small force to give the new doctrine a fair test remains questionable; in the opening battles around Madrid, he rarely had more than 50 Mark Is at his disposal.

Krivoshein's frequent failure to overcome an identical tendency among Republican commanders was probably no more significant a factor in the war's outcome, and he, like Thoma, labored under a prohibitive tank shortage. But he had other problems as well. Whereas Thoma's first volunteers all came from the 29th Armored Defense Regiment in Kassel, the Krivoshein Detachment was drawn from several different divisions of the Belorussian Military District, and few of its original 180-man complement had trained together. Moreover, a high percentage were administrative or maintenance personnel with no tank training, and most of the tankers were officers and senior NCOs. Beneath this cadre, only a third of the authorized enlisted men were

present, and the biggest shortage was among tank crewmen.<sup>27</sup>

Far more desperate for Spanish volunteers than his German opponent, Krivoshein was also far more constrained by his superiors in matters of recruiting. Because the T-26 was a concrete manifestation of proletarian revolutionary might, only devout Communists were allowed to operate it.

Although Krivoshein would later write of his first trainees as “a Popular Front in miniature,” accounts from the ranks indicate that non-Communists with mechanical backgrounds were often rejected in favor of more politically acceptable but technically unqualified inductees.<sup>28</sup> Worse yet, the instruction was conducted via an interpreter, for not one of Krivoshein’s instructors spoke Spanish. The training, he dryly noted, “was not easy.”

Nor was it always complete. Not all drivers knew how to get their tanks out of first gear and, in one instance, a tank commander broke contact with the enemy because he had not learned how to fire the main gun.

Even had the training conditions been ideal and the Spanish tankers appreciative of independent mechanized operations, an inescapable irony would have remained: Both Tukhachevsky and Guderian had intended such operations to preclude strategic stalemates. In Spain, however, all but a handful of the approximately 180 German and 700 Soviet tanks to see action arrived well after initial Spanish dispositions, political priorities, and physical geography had created precisely that problem. Although thinly defended in many places, the line separating Nationalist from Republican territory existed for the most part by October 1936. In the Madrid area, where political imperatives demanded that both tank forces be committed prematurely, ideal tank terrain was in limited supply.

Because of these geographic and political constraints, the technological superiority of Soviet armor came to matter only at the tactical level and, where imported doctrines were concerned, neither Guderian’s *schwerpunkt* (thrust point) nor Tukhachevsky’s *glubokiy boi* (deep battle) were to receive fair tests. By default, experimentation in the “Spanish Laboratory” degenerated into a series of *ad hoc* tactical adjustments by commanders who were understandably more concerned about accomplishing missions than proving theories.

## Notes

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<sup>2</sup>Ferdinand O. Miksche, *Attack: A Study of Blitzkrieg Tactics* (New York: Random House, 1942; reprinted., Carlisle, Penn.: U.S. Army War College, 1983), pp. vi, 9, 11.

<sup>3</sup>Manfred Merkes, *Die Deutsche Politik im Spanischen Burgekrieg 1936-1939* (Bonn: Ludwig Rohrscheid, 1969), pp. 67-68; Werner Beumelburg, *Kampf um Spanien: die geschichte der Legion Condor* (Oldenburg: Gerhard Stalling, 1942), p. 36.

<sup>4</sup>John Milsom, *Russian Tanks, 1900-1970* (New York, Galahad, 1970), p. 52; David Glantz, *Soviet Military Operational Art: In Pursuit of Deep Battle* (London: Cass, 1991), pp. 92-93.

<sup>5</sup>Miksche, pp. 4-12 passim.

<sup>6</sup>Hans von Seeckt, “The Armies of Today,” *Cavalry Journal*, vol. 39 no. 159 (April 1930), pp. 256-7.

<sup>7</sup>Heinz Guderian, *Achtung--Panzer! 1937*; (reprint ed., trans. Christopher Duffy, London: Cassell, 1995), p. 153.

<sup>8</sup>Guderian, in *Journal of the National Union of German Officers*, 15 Oct. 1937, reprinted in *Panzer Leader* (trans. Constantine Fitzgibbon, New York: Dutton 1952, reprint edition., New York: Da Capo, 1996), p. 39.

<sup>9</sup>Guderian, *Achtung*, p. 153.

<sup>10</sup>Guderian, *Panzer Leader*, pp. 39-44 passim; *Achtung*, pp. 154-155, 188-198 passim.

<sup>11</sup>Guderian, *Achtung*, p. 169.

<sup>12</sup>Thoma, quoted in B.H. Liddell Hart, *The German Generals Talk* (New York: Wm. Morrow, 1948), p. 92.

<sup>13</sup>Walter D. Jacobs, *Frunze: The Soviet Clausewitz, 1885-1925* (The Hague: Martinus Nijhoff, 1969), pp. 20-1, 46-9, 52-3, 83-4; Milsom, p. 31; Glantz, pp. 74-76.

<sup>14</sup>Milsom, p. 31; Glantz, pp. 74-76.

<sup>15</sup>Milsom, p. 38; Mikhail N. Tukhachevsky, “New Questions of War,” (written in 1932) in *Voyenno-Istoricheski Zhurnal* (February 1962), translated and reprinted in Richard Simpkin, *Deep Battle: the Brainchild of Marshal Tukhachevskii* (London: Brassey’s, 1987), pp. 139-142; “The Development of Forms of Command and Control” in *Krasny Zvezda* (21 February 1934) translated and reprinted in Simpkin, pp. 155-156.

<sup>16</sup>*PU-36*, Chapter 1, Article 3, translated and reprinted in Simpkin, p. 178; also partially translated in Milsom, pp. 46-48.

<sup>17</sup>*Ibid.*, Chapter 1 Articles 7, 9. Milsom’s translation of article nine uses “battle front,” whereas Simpkin uses the less linear “tactical layout.”

<sup>18</sup>*PU 36*, Articles 7-9 passim.

<sup>19</sup>Semyon M. Krivoshein, in *Taktik Schneller Verbände* (Potsdam: Voggenreiter Verlag, 1934), p. 42.

<sup>20</sup>Milsom, pp. 83-86; Richard N. Ogorkiewicz, “Soviet Tanks,” in Liddell Hart, ed., *The Soviet Army* (London: Weidenfeld & Nicholson, 1956), pp. 298, 300-302; Denis Bishop and Christopher Ellis, *Vehicles at War* (London: Allen & Unwin, 1979), p. 72; Macksey, *A History of Armored Fighting Vehicles*, (New York: Scribners, 1977), p. 57.

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<sup>22</sup>Ogorkiewicz, p. 300; Krivoshein, “Tanquistas Voluntarios Sovieticos en la Defensa de la Madrid,” in N.N. Voronov, *Bajo de la Bandera de la Espana Republicana: recuerdan los voluntarios sovieticos participantes en la guerra nacional revolucionaria en Espana* (Moscow: Editorial Progreso, 1971) pp. 320-323. Originally published as “Tankisty Dobrovoltsy,” in Voronov, *Pod Znamenem Ispanikoi Respubliki: 1936-1939* (Moscow: Nauka, 1965), pp. 446-468.

<sup>23</sup>Ellis, *Tanks of World War II* (London: Octopus, 1981), p. 103; F.M. Senger and Etterlin, *German Tanks of World War II*, trans. J. Lucas (Harrisburg: Stackpole, 1969), pp. 21-23, figs. 11-15.

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<sup>26</sup>Thoma, quoted by Liddell Hart in *The German Generals Talk* (New York: William Morrow, 1948), pp. 92-3.

<sup>27</sup>Krivoshein, “Tanquistas Voluntarios,” pp. 320-323.

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# Weapon Storage Site Inspections

by First Lieutenant Justin W. Verhey

Weapon storage site inspections are used to ensure the Entity Armed Forces (EAF) of Bosnia-Herzegovina maintain accountability of their weapons and munitions. The accountability is then checked regularly by SFOR. The Dayton Accords and the General Framework Agreement for Peace (GFAP) make the EAF store all their weapons in centralized locations. These sites range in size from company-sized arms rooms to corps-sized installations. Each location is responsible for maintaining accountability of all the weapons and ammunition at the site. The sites are checked regularly to ensure no weapons have been moved on or off the site without permission from SFOR. These inspections are important since they ensure the EAF are not mobilizing their equipment for use against SFOR or another entity.

This article will outline the steps necessary to successfully complete an inspection. The article is based upon the Alpha Company, 1st Battalion, 37th Armored Regiment's SOPs and experiences in Bosnia. It is also based upon observations watching the Russians conduct inspections around Bijelina, in Northeast Bosnia.

The inspection process can be broken down into three distinct phases; preparation, pre-inspection, and the actual inspection. The process should begin a week before the actual inspection occurs with the preparation phase. The success of the operation is dependent upon this first phase of the operation.

The preparation phase begins by signing out the weapon storage site (WSS) folder from the S2. As a minimum, the folder contains a map of the compound and an inventory of what is stored there. However, most folders contain much more. The better folders also have all of the previous inspections, movement documents, and destruction certificates. While at the S2, the inspection leader should also make sure the EAF is notified through the Joint Military Commission (JMC). Also, he should ask if there are any PIR for the site, such as conditions of the weapons, construction at the site, or weapons of special interest.



Inspecting officer checks small arms storage at Bosnian site. - Photos: ILT Shane Celeen

The most important information in the folder is the inventory list. The nomenclatures of some items on the list are in Serbo-Croat, while others are in English. The inspector should become familiar with as many of the weapons on the list as possible. I found a good way to accomplish this was asking interpreters with military experience to help in identification. In an ideal operation, this same interpreter will accompany you for the inspection to aid in the identification. Another good source of weapon and ammunition identification is the EOD team. They often have pictures of all the weapons and in some cases the weapons themselves. The time spent learning the equipment saves time during the actual inspection. Also, if you are familiar with the weapons and ammunition, it will eliminate confusion during the inspection.

The inspection list is also invaluable because it will aid in the plan of execution for the site. The smaller the inventory, the fewer people need to be involved in the operation. The most basic site will just need an inspection team of 3-4 people and an outside security team made up of 5-6 soldiers. If the site is large, several inspection teams might be needed along with the outside security team.

The second vital item in the WSS folder is the site map. Sometimes the map is

complemented by satellite images of the site. Using these assets, plan where to position your vehicles (we normally utilized up-armored HMMWVs for the inspections). The outside vehicles need to be positioned both to provide security of the site and to aid in quick entrance and exit to foster a professional image. Some sites have room inside for parking the vehicles, while some don't. In the first case, at least two vehicles must be positioned outside the compound to provide security and possibly isolate the compound if a situation arises. When positioning the vehicles, analyze the terrain and the buildings in the area to maximize the fields of fire into a compound. Also consider the avenues of approach into the compound. What can you realistically cover? The vehicles on the inside need to be positioned so they can quickly leave and do not interfere with movement inside the camp. If there is no room for the vehicles inside, the inspection team should park as close to the gate as possible, while the outside security section needs to set up in a good overwatch position. If possible, coordinate with the previous unit that inspected the site to find out where they positioned their vehicles and any problems that arose during the last inspection.

During the preparation phase, we rehearsed detailed contingency plans. We foresaw several possible areas in which problems might arise. The contingencies we foresaw included weapon seizures, a fire or explosion in the compound, threats to the inspection teams by the EAF, hostage situations, or a large civilian crowd assembling at the compound. Every soldier must know exactly what to do in these situations to avoid confusion.

The most important contingency to rehearse is that of a weapon seizure. If a weapon needs to be seized, wait until the entire inspection is complete to seize the weapon. Assess the stability of the weapon. If there is a question of the stability of the weapon, call higher and ask for EOD assistance at the site. If the weapon is safe, have the vehicles go to REDCON 1. If vehicles are inside the compound, drive a vehicle to the building where the weapon is stored and quickly place the weapon inside the designated





At left, a column of T-35-85s and a Soviet-built transport helicopter in storage at a weapons site in Bosnia.

At lower left, a T-54 and an APC.



this case, note the new location of the weapon and move on. Sometimes, major movements occur inside the compounds and writing down the new locations is not practical. When this occurred, we demanded that the EAF provide us a copy of the new inventories to avoid confusion on where the equipment was moved. If a discrepancy cannot be explained during the pre-inspection, remind the entity that if the discrepancy cannot be resolved during the inspection, the equipment is subject to confiscation. Only two teams are involved during the pre-inspection, the outside security team and the inside paperwork team. The inside team should only have three people involved in the inspection; the inspector, an interpreter (again the interpreter should have military experience), and a security/RTO man positioned outside any building the team goes to. The outside security team consists of vehicle drivers, vehicle gunners, an interpreter, and a team leader.

vehicle. We brought a five-ton truck to sites where we had problems with the pre-inspection, to ensure we could remove any type or amount of ammunition or equipment. The key to this contingency is speed, so the EAF does not have time to alert the local population that SFOR is taking their weapons.

Another contingency that needs to be addressed is that of a fire or explosion inside the compound. A centralized rally point needs to be designated for this contingency. If the inside inspection team felt threatened, the contingency plan called for everybody at the site to chamber a round, the vehicles to go to REDCON 1, and the inspection team to quickly go to its vehicles and leave the compound. The same plan would be implemented if the outside security felt threatened by either a large crowd or by the EAF. Finally, if a hostage situation ever developed, the outside vehicles would immediately seal off the compound and would not let anyone in or out. The idea is that if SFOR

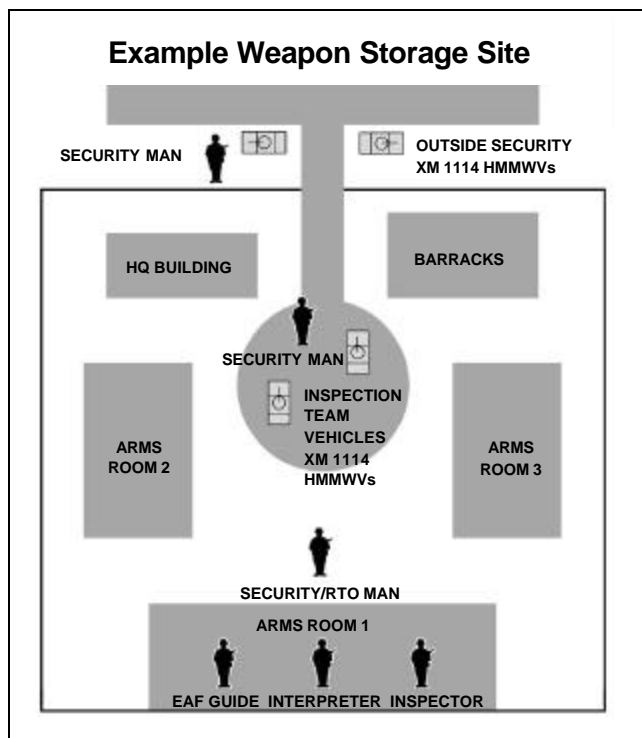
personnel are taken hostage, then SFOR will hold everyone at the site hostage.

During the preparation phase, assemble and check the necessary equipment. We used the PCI list shown in Figure 1. As soon as your NCOs complete the PCI checklist, the pre-inspection can begin.

The next phase is the pre-inspection phase. The pre-inspections are conducted 48-72 hours prior to the actual inspection. The pre-inspection compares SFOR's and the entity's paperwork to identify and resolve inventory discrepancies before the inspection. If there is a discrepancy, it is usually explainable. The normal causes of discrepancies are that weapons were moved or destroyed since the last inspection and SFOR's inventory has not been updated. If this situation arises, find the document that details the movement or destruction and note the document control number. Another cause of discrepancies is that the EAF moves weapons between arms rooms and does not tell SFOR about it until the pre-inspection. In

Another reason for the pre-inspection is to quickly brief the EAF on your inspection plan. Tell the EAF the day of the actual inspection and roughly what time the inspection will start. Also tell them how many inspection teams you will have in the compound so they will have the correct number of guides. During the entire pre-inspection the EAF will feel you out. Act professionally to gain their confidence, which will aid in the inspection itself. The EAF are striving to be professional soldiers and will be easier to work with if you are also.

The last phase is the actual inspection. The same personnel that participated in the pre-inspection need to participate in the actual inspection. The inspection team's vehicles need to be positioned before the inspection starts, preferably in the same positions. At the minimum, each inspection team needs an inspector, an interpreter, and a security/RTO ele-



ment. The idea is to minimize the number of people inside the buildings of the compound. On some inspections other people, such as the S2, EOD, or a JMC representative, will accompany the inspection. The rest of the platoon needs to stay with the vehicles and maintain security around them. The inspection teams should immediately link up with the EAF and begin the inspection. During the inspection, the security man should remain outside the EAF's arms rooms and keep the rest of the platoon informed of the location of the inspection team. It is important for the security man to send regular SITREPS even if there is little to report. This keeps the outside element alert and ready to react if a situation arises.

The platoon leader who conducts the inspection is the key to the entire operation. He needs to be organized and efficient. All the equipment at the site does not need to be counted every time. The JMC handbook states all air defense, heavy weapons, and heavy weapon ammunition needs to be counted every time. Then only one of the following needs to be counted: long-barreled weapons, mines, tube-launched projectiles and ammunition (37mm and above), and grenades. The remaining three categories need spot-checking. The next time the site is inspected, choose another category to inventory. Then repeat this process on future inspections until all categories have been inventoried. In reality, the process the handbook recommends will rarely work because the EAF may move equipment in and out of arms rooms, and the unit doing the inspection is not always

of the equipment is stored in crates with the type and number of items inside clearly labeled on the crate. It is fine to count the numbers on the crates, but spot-check a few of the crates to ensure the numbers are correct. If a discrepancy exists for a particular room, recount the disputed item. If the discrepancy still exists, note it down and move on. More often than not, the discrepancy will be corrected in another room. This is fine as long as the amount of equipment or ammunition at the site remains the same. While you are at the site, ensure you check all the items on the inventory. When this is done, the inspection is complete.

If there was a discrepancy that was not resolved, the disputed equipment is subject to confiscation, which must be authorized by the battalion commander. He can also adjust the inventory at the site and hold the EAF responsible for the new number on future inspections. If a confiscation does occur, all equipment will be confiscated 1 for 1, regardless of whether it is an overage or a shortage. For example: if the EAF is accountable for 100 AK-47s and you only can find 95, confiscate 5 rifles. When a confiscation occurs, fill out a DA 4137 form and give a copy to the

the same due to unit rotations and troop taskings. The best way to inspect the site is to simply count 100% of all categories.

No matter which category you decide to inspect, decide upon a way to inspect each room and stick with it throughout the entire inspection. The key to the actual inventory is counting the munitions at the site in a consistent manner. If you do not inventory the site in a consistent manner, *you will fail*. I found the best way to inspect was to start at one side of the room and work across the room. A lot

EAF. Do not apologize for the confiscation. The EAFs signed the GFAP and agreed to abide by the rules. SFOR is merely in Bosnia to fairly uphold the agreement.

Regardless of whether a seizure occurs, execute a professional exit. This complements the entire professional appearance that you uphold throughout the entire inspection. When the platoon returns from the inspection, completely debrief the S2 and the battle captain on what occurred during the inspection. Remember to cover any PIR that was requested. Also update the WSSI folder with any changes to the inventory or site plans that you discovered. It is a good idea to check the folder a week after the inspection to ensure these changes were noted. Finally, conduct an AAR with the entire inspection team. More often than not, even the lowest-ranking soldier can see something to improve upon. As soon as this is done, the mission is complete.

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#### Weapon Storage Site Equipment/PCI List

Per Team	In a Vehicle
Short Range Commo like PRC 126	Crow Bars
Inventory of Site	Hammers
Site Map	Bolt Cutters
Clipboard	Chisels
Camera	Tanker Bars
Extra Pens	Wire Cutters
Flashlight w/extra batteries	
DA 4137S (for confiscation)	
JMC Handbook	
Interpreter	
Chalk	
Seals (To seal boxes that you want to avoid re-inventorying in the future)	
Scratch Paper	
Calculator	

Figure 1: WSSI Inspection Packing List

# How the Guard Could Cut Costs on Table VIII Without Really Trying

by Dr. Joseph D. Hagman and Dr. Monte D. Smith

In today's environment of ever diminishing resources, do you as an Army National Guard (ARNG) armor unit commander find yourself under pressure to do more with less, especially when it comes to your tank gunnery program? Back in 1996,<sup>1</sup> we developed a timesaving, device-based gunnery training strategy to provide you with some relief. Nonetheless, you say the prospect of more resource cuts looming on the horizon is still making you nervous. So, where else can you turn to cut costs without sacrificing the gunnery proficiency of your tank crews?

While training devices may once again provide an answer, we've been looking instead for a way to cut the cost of live-fire gunnery evaluation. After analyzing the 1993-1997, first-run, Tank Table VIII (TTVIII) scores of 716 ARNG crews in Project SIMITAR's (Simulations in Training for Advanced Readiness) gunnery database,<sup>2</sup> we've come up with what we think is an easy-to-implement strategy for cutting the range time, ammunition, and OPTEMPO costs of TTVIII.

Although it may sound like heresy to suggest a change in how TTVIII is evaluated, the threat of future resource cuts has given us little choice but to at least consider the notion. In reading on, you'll find out exactly how the strategy works and the kind of resources it would save.

## How the Strategy Works

The strategy uses cutoff scores to predict, as early into TTVIII as possible, which crews will, and which crews

won't, first-run qualify (Q1). These predictions are then used to qualify some crews and to send others back for remedial training — two actions that to date have had to await the firing of all 10 engagements.

Table 1 shows what the cutoff scores would be, based on the performance analysis of our tank crew sample. For example, crews scoring 109 or lower after two engagements would be predicted to achieve Q1 no more than 5% of the time, whereas those scoring 176 or higher would be predicted to achieve Q1 at least 95% of the time. Crews scoring 164 or lower after three engagements would be predicted to achieve Q1 no more than 5% of the time, whereas those scoring 256 or higher would be predicted to achieve Q1 at least 95% of the time, and so on. Crews firing between the cutoff scores would continue firing. Those scoring between 109 and 176 after two engagements, for example, would continue on to the third engagement. They would then be reevaluated on the basis of how they scored in relation to the cutoff scores provided in Table 1.

These predictions will apply to whatever set of 10 TTVIII engagements you plan to fire. Thus, you don't have to modify your training program or your TTVIII engagement scenario for the predictions to hold up. You just have to be willing to use them in making early qualification and remedial training decisions based on the cutoff scores provided. It's that easy, and your decisions will be correct at least 95% of the time.

TTVIII by firing the first two of the 10 scheduled engagements. Those scoring 109 or lower would be pulled from the range and given remedial training, perhaps on the Conduct-of-Fire Trainer (COFT) or Abrams Full-Crew Interactive Simulation Trainer (AFIST). Following remediation, they would be given one rerun attempt, starting at the top with the first two engagements.

First-run crews scoring 176 or higher after the first two engagements would be awarded early qualification (Q1e); those scoring from 110 to 175 would go on to the third engagement. Crews scoring 164 or lower after three engagements would undergo remediation before beginning their rerun from the top. Rerun crews would be evaluated as if they were firing their first run, except that predictions would now apply to Q2 rather than Q1. Those predicted to need remediation as a result of poor performance on their rerun would receive an unqualified rating. First-run crews scoring 256 or higher after three engagements would be awarded early qualification; those scoring from 165 and 255 would go on to the fourth engagement, and so on.

## What's The Payoff?

Generally speaking, the earlier in the TTVIII engagement firing sequence that predictions can be made, the greater the resource savings will be. Assuming that each engagement accounts for roughly 10% of the total resources spent on TTVIII, crews predicted to Q1 after only two engagements would save about 80% of the resources needed to fire all 10. Those predicted to Q1 after three engagements would save about 70%, and so on.

We believe that resources can be saved by predicted Q1 crews as well as by those predicted to need remediation. Using our tank crew sample, we calculated (a) the number of crews in a typical 58-crew battalion that would be predicted to Q1 after each engagement, and (b) the predicted number of engagements they would save. As shown in Table 2, the seven crews predicted to Q1 after two engagements would save a total of 56 engagements (7 crews x 8 engagements =

# of Engagements Fired	Remediation Cutoff Scores (≤)	Q1 Cutoff Scores (≥)
2	109	176
3	164	256
4	215	317
5	304	390
6	357	458
7	439	524
8	500*	592
9	600*	643

\*Mathematically eliminated

Table 1. Cutoff Scores for Remediation and Q1 Predictions

## Implementing the Strategy

Figure 1 shows, in part, how the proposed evaluation strategy would be implemented using the cutoff scores in Table 1. In general, crew gunnery proficiency would be evaluated after the firing of each TTVIII engagement, rather than after the firing of all 10. All crews, for example, would begin



56), the one crew predicted to Q1 after three engagements would save seven engagements, and so on, with 121 engagements saved in all by the entire battalion. Thus, on predicted Q1 crews alone, 21% (121/580) of an armor battalion's first-run engagements could be saved merely by applying the proposed evaluation strategy.

Battalion resources should also be saved on crews predicted to need remedial training simply because they can be identified before they've fired all 10 TTVIII engagements. Just exactly how much savings, however, would depend on how many rerun engagements are fired. Having crews start their reruns from the top, and then reapplying the proposed cutoff-score strategy, should help to maximize the savings on each rerun attempt. Thus, in general, reducing the number of engagements fired through early prediction of which crews will, and which won't, first-run qualify should translate into less range time, fewer rounds, and reduced OPTEMPO costs each year on TTVIII. These savings can be used to offset future resource cuts or, until then, be either pocketed or used for other purposes such as platoon-level gunnery.

### What Next?

Since we started looking for a way to cut the cost of live-fire gunnery evaluation, the TTVIII engagements have been changed.<sup>3</sup> So, we still need to test our strategy out on the new engagements once enough first-run data become available. Although the specific cutoff score values for early qualification and remediation, as well as the level of expected resource savings, may change somewhat from that reported here, the notion of using cutoff scores for prediction purposes should still work. We'll just have to wait and see how well.

# of Engagements Fired	Predicted # of Early Q1 Crews	Predicted # of Engagements Saved
2	7	56
3	1	7
4	3	18
5	4	20
6	3	12
7	2	6
8	1	2
9	0	0
<b>Total: 21</b>		<b>Total: 121</b>

Table 2. Predicted # of Engagements Saved by an Armor Battalion on the first Run of TTVIII

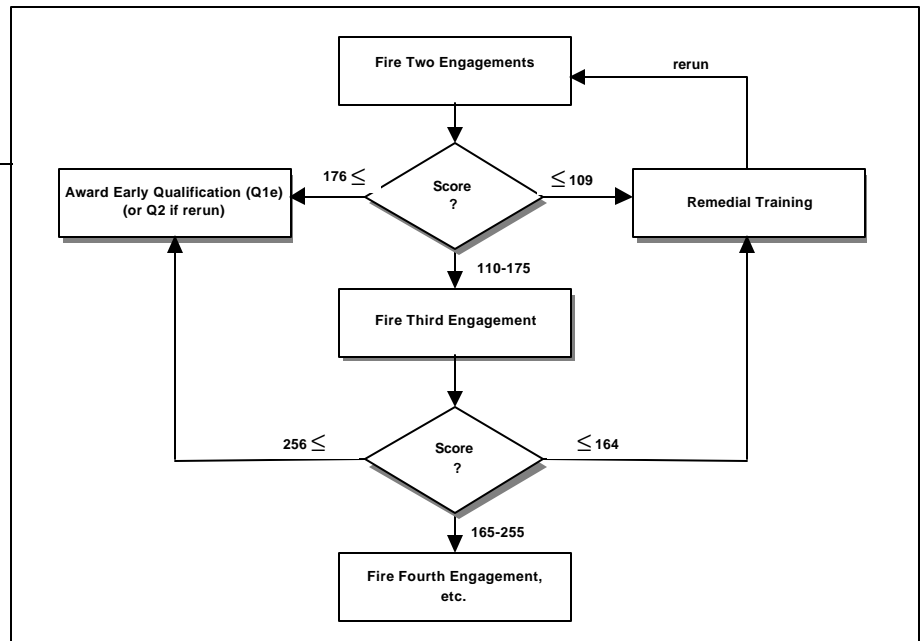


Figure 1. Flowchart of TTVIII engagement sequence

We also need to extend our investigation to the Active Component (AC). Just to see what would happen, we did analyze the 1993-1994, first-run TTVIII scores<sup>4</sup> of 838 Grafenwoehr-firing crews and found no need to develop early qualification and remediation cutoff scores because the Q1 rate was so high (98%). Thus, before even a single round is fired downrange, one could predict with near certainty that any particular AC crew would Q1. Given such a high Q1 rate for "Graf-firing" crews, one has to wonder why they fire TTVIII at all in these days of tight resources. But that's another matter. An answer to the question of whether such a high Q1 rate will be fired on the new engagements by Graf-firing crews, or by AC crews stationed stateside, must await further data collection. We'll get back to you on what we find.

In the meantime, we believe that range time, ammunition, and OPTEMPO costs can indeed be cut considerably on TTVIII, without jeopardizing its purpose and intent, by simply evaluating crew performance as you go along, rather than waiting until all TTVIII engagements are fired. The strategy just described is an easy way of doing so that we think makes sense.

We'd like to hear your thoughts on this. You can reach us by regular mail at the U.S. Army Research Institute, 1910 University Drive, Boise, ID 83725; by telephone at 208-334-9390; or by e-mail at hagman@ari.army.mil.

### Notes

<sup>1</sup>Hagman, J. D. & Morrison, J. E. (1996, November-December). "Research Pays Off for the Guard: A Device-Based Strategy For Training Tank Gunnery," *ARMOR*, pp. 48-50.

<sup>2</sup>Smith, M.D. (1998). *User's Manual for an Army National Guard (ARNG) Armor and Mechanized Infantry Gunnery Training Assessment Database*. (Res. Product 98-34). Alexandria, Va.: U.S. Army Research Institute.

<sup>3</sup>Department of the Army (1998). *Tank Gunnery Training (Abrams)* (FM 17-12-1-2). Washington, D.C.

<sup>4</sup>Thanks to Mr. Al Pomey of the U.S. Army Armor School for providing these data.

Dr. Joseph D. Hagman is a senior research psychologist at the U.S. Army Research Institute's field office at Gowen Field, Idaho (208-334-9390). He received a Ph.D. in engineering psychology from New Mexico State University. His research interests are in human learning and memory, and more recently, in soldier performance on armor-related simulation and training devices.

Dr. Monte D. Smith is a senior research scientist with Raytheon Systems Company, Boise, Idaho (208-362-2757). He received a Ph.D. in social psychology and experimental design from Vanderbilt University. His research interests include social comparison theory, measurement of self-concept, assessment of intellectual functioning, and evaluation of training effectiveness.

## LETTERS (Continued from Page 4)

Regrettably, that's about as far as I can go. BEAMHIT is not an authorized training device, nor was it procured under provisions of the Federal Acquisition Regulation. No unit is authorized to procure training devices with unit or operating funds, even, as in the case with BEAMHIT, if it is available through GSA catalog ...

At a minimum, they violated long-standing guidance in such matters from HQ DA. All training aids, devices, simulators and simulations (TADSS) or procured either by the system Program Manager or by DA DCSOPS using Training Mission Area (TMA) funds. In either case, the authorization document is an approved Operational Requirement Document (ORD).

As slow and often unresponsive as our system is, it is what we have to use. The Army is now procuring the Engagement Skills Trainer (EST) for Army-wide distribution to units and to Training Centers. This device is as far advanced from BEAMHIT as the space shuttle is from a WWI biplane. Better, it is fully supported logistically by Army funding. How will C-3-81 repair their BEAMHIT?

Finally, in developing the POI used with BEAMHIT, did USAARMC staff the POI with the proponent for all small arms training — Fort Benning or with HQ TRADOC? I believe the answer is "No." Standardized training is necessary if the Army is to execute its doctrine correctly. If every OSUT unit develops its own, locally unique POI, chaos is sure to follow.

RICHARD M. POTTER  
Chief, Combat Arms Team  
U.S. Army Training Support Center  
Fort Eustis, VA 23604-5166

### An Entrepreneurial Spirit Would Renew Army Culture

Dear Sir:

I noted with interest the letter from CPT Coglianesi concerning the beliefs and proposals of MAJ Vandergriff. This brings back the question of long standing as to what our leaders at the top are up to after all the turmoil of down-sizing and seemingly endless operations such as Bosnia, *et al.* I don't pretend to know what the present culture is in the Army today, so can only surmise. I do agree that a new culture is needed if the Army is going to handle its future tasks effectively, and that future may not be far off. When I write on the matter of "a new culture," I am trying to establish that what has been going on in the Army since 1992 has got to change. To use the old phrase, it has been "go along to get along." This is dreadful!

I have believed for some time that what is needed is to provide an appropriate entrepreneurial spirit, with emphasis at the battalion and lower levels — for a start. This has never been done to my knowledge, as the bureaucratic mode has prevailed for such a long, long time. It has been exacerbated during the drawdown as junior officers quickly learned

that doing anything other than obeying orders stringently meant an ultimate boot out of the Army. Perhaps this atmosphere has abated somewhat, but I doubt that any real change in senior level attitudes has materialized. Seniors have advanced by playing ball (not kicking it out of bounds), and as this worked for them, their subordinates must do likewise. An entrepreneurial spirit means seizing the initiative when the opportunity arises — or is created — and the encouragement and support are there, and doing the different that is better. Challenging the present means some conflict typically ensues, but this can be a positive development if done right.

There are obvious problems with this environment. First, relatively inexperienced junior officers will surely make mistakes that in the recent past have been fatal to careers. Second, seniors must accept the responsibility for these mistakes and keep on encouraging continued effort, simultaneously helping to develop these aspiring junior officers. In this connection, seniors must be prepared to assume certain risks that far too much in the past have adversely affected their careers. Third, for seniors to be willing to stake their reputations on subordinates' learning experiences, they must be so encouraged by their superiors. From the Chief of Staff's office on down. Mutual trust and respect must prevail.

Right now, trust of those at the top hardly is robust. There are a number of reasons for this that require much more extensive treatment than available in this message. Fundamentally, junior officers do not believe that seniors are leveling with them on a variety of critical issues. Subordinates can quickly tell when a superior is lying.

Trust is so basic that it must be resolved before anything else of lasting benefit can be attempted.

COL GEORGE G. EDDY  
Austin, Texas

### Computer Simulation: Part of Annual Training Strategy

Dear Sir:

It is refreshing to see continuing debate on how simulations fit in today's training strategy. COL Guy Swan III's letter, "Computer Simulation Fallacy: Assuming Troops Are Well Trained," addresses the issue of simulations as it relates to maneuver training and troop training readiness. I agree that nothing can replace live training on a realistic battlefield like the CTCs provide. However, we should remember that all but war is simulations.

Recently, CTC newsletters have addressed the fact that units are not at entry level when they arrive at the CTCs. There is no doubt in my mind that simulation-based training, integrated into a training strategy, properly utilized, and professionally observed and controlled, have a place in training the maneuver forces of tomorrow's Army. Simulations are an efficient way of achieving the level of readi-

ness required to execute training at the CTCs in these days of dwindling resources. Once again I reiterate, to be effective, simulations must be integrated into a training strategy, properly utilized, and professionally observed and controlled.

The first questions to address is: "Have our current training strategies correctly integrated simulations into the Army's overall training strategy (i.e., AR 350-1 and AR 350-2)?" I contend that the Army strategy needs clarification on the WHO, WHAT, WHEN, WHERE and WHY units will use simulation training.

The second question is: "Are simulations systems properly utilized?" First, commanders must understand that unit performance based on a constructive or virtual simulation cannot be construed as an assessment of the unit's actual tactical abilities in either a live simulated training environment or war. I believe we need to identify the tasks that can be trained, partially trained and not trained utilizing simulations. After gathering those tasks which simulations can train (i.e., battle tracking, situational awareness, synchronization, etc.), scenarios/operations orders can be developed to train, sustain and/or even test those skills. The scenarios/operations orders can be compiled into standard flowcharts/matrices that can be used to meet the training needs of each individual unit (i.e., like matrix used to facilitate UCOFT).

The third question is: "Are all levels of constructive and virtual simulations professionally observed and controlled?" Years ago, the Army proved the principle that observed and controlled training is required to obtain a quality result. However, many units conduct simulation training with no or unqualified observers and controllers. I believe this is another issue to be addressed in AR 350-1 and AR 350-2.

COL Swan addresses constructive simulations such as Brigade/Battalion Battle Simulation (BBS), JANUS and WARSIM 2000 noting that these simulations do not properly address all Battlefield Operating Systems (BOS). Simulations are only limited by the imagination. For example, a Field Artillery (FA) Battalion could integrate their organic tactical equipment (i.e. IFSAS) and operate the digital system. Air Defense Artillery (ADA) could integrate their tactical early warning system (FAADC3I). Intelligence officers could link to higher ASAS Warrior systems. Combat Service Support (CSS) capabilities are there (especially in BBS), but we too often leave this key BOS idle, because it is too time and personnel consuming. BOSs can be worked with small workarounds utilizing constructive simulations.

Where constructive and virtual simulation training fit into the annual training strategy to achieve the level of readiness required by our active and reserve unit is an issue. Virtual and constructive simulations should be implemented into the overall training strategy of the Army as discussed previously.

**Bottom Line.....**we must realize that virtual and constructive simulations are here to stay.

# The ACAV Lives...in Bosnia

by Sergeant First Class Gregory T. Dean (Retired)

Having just retired from the Army, my access to *ARMOR* magazine is limited. Finding a copy, I read the article on the need for the ACAV and the absence of the kits for the M113s. Preparing for our deployment to Bosnia in the fall of 1995 while in Graf and seeing the possible threats to the two M113s in our company, I convinced the 1SG to let me attach 20mm ammo cans to the sides of his track. These cans were filled with dirt or sand; they ended up with extra oil, MREs and whatever else could be stuck in there. This still provides the effect of spaced armor.

The gun shields were somewhere in the system since some of the M-88s in our battalion had them. Our ever-resourceful motor sergeant found the ACAV kits in the system, and, while back at home station in Friedburg, they arrived and were installed on the 1SG's 113 and on our maintenance track.

Our company was attached to 3-5 Cav from Kirchgoens. Our company was further broken up with the 3rd platoon going to an infantry company and we got one BFV platoon. So we ended up with two mixed platoons and one tank pure. After about two months in country, we became a tank pure company again. Platoons used in patrolling actions were made up of two tanks and our two M113s. The



An ACAV kit on an M113, with improvised spaced armor made from empty ammo cans.

M113s were manned by the crews of the two tanks that were left back at Camp McGovern. All these crewmembers were armed with M16s and one M-60 machine gun.

Our Bosnia ACAVs were quite effective in patrolling the narrow streets in the Zone of Separation. It is difficult to maneuver an M1A1 through narrow streets and laying M-2 Flex is a lot easier than slewing a 120 in a narrow side street. Mind you, the M1 gets more respect than any other vehicle in the area. "Peace Through Intimidation."

The ACAV kits are out there, and they are just as effective today as they were in Vietnam.

**Editor's Note:** You can find *ARMOR* Magazine via the Web at:

*knox-[www.army.mil/dtdd/armor](http://www.army.mil/dtdd/armor)*

or via Fort Knox's web page at:

*<http://147.238.100.101/>*

*We are slowly but diligently adding past issues to our web page. — Ed.*

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## LETTERS (Cont.)

Leaders must understand simulations. Commanders especially must understand what simulations will and will not do and then implement simulations into their overall training strategy.

COL (RET.) J.W. THURMAN  
Director, Fort Knox Senior Observer  
Controller Team (SOCT)

### The National D-Day Museum To Open in New Orleans

Dear Sir:

On the 56th Anniversary of the Normandy invasion, June 6, 2000, the National D-Day Museum will open its doors in downtown New Orleans. The Museum will be the first of its kind to tell the story of the United States amphibious operations around the globe in World War II.

Located in the Warehouse Arts District of New Orleans, the 67,000-square-foot museum will house the St.-Lô Collection from La Musée de la Libération de St.-Lô in Normandy, France — a rich collection of artifacts from Utah and Omaha Beaches — including German vehicles, sentry boxes, and a wide array of weapons and equipment used by both sides during this conflict, as well as privately owned artifacts donated by veterans.

A 16,000-square-foot gallery will be divided into four state-of-the-art interactive historical and educational exhibits that will include oral and written histories from veterans worldwide, military equipment, photographs, and never-before-seen film footage.

"This museum is the only one of its kind in this country. It will celebrate the famous Normandy D-Day invasion, but it will also portray all the other WWII D-Day invasions fought by the Navy, Marines, Army, Army Air Force, and Coast Guard in every invasion of the war,"

said Dr. Gordon Mueller, elected chairman of The National D-Day Museum.

Please pass this information on to your readers. For more information, they can contact: (504) 525-1544.

BRIDGET VOIGT  
The National D-Day Museum  
New Orleans, La.

### **ARMOR Magazine 1998 Index**

The *ARMOR* Magazine 1998 index is now available. You can request a copy by email at [armormag@ftknox2-emh3.army.mil](mailto:armormag@ftknox2-emh3.army.mil) or by contacting Mary Hager at DSN 464-2249/2610; commercial (502) 624-2249/2610.

environment. Pressures to lower standards are great but the requirement for quality recruits in the Armor Force will increase rather than decline. The skills that NCO and Officer leaders require are challenging and diverse. We are currently holding the line on the quality of Armor recruits and our NCO corps is more highly educated than ever.

**Conclusion**

I don't have to remind any of you that we face challenges on a daily basis. It is essential, however, that we occasionally put things into perspective and remember the positives that will forever make ours the "Combat Arm of Decision." Armor and cavalry leaders have a responsibility to pass on to all newer members of the Force an appreciation for the "nobleness" of our profession. Army service, particularly as armor crewmen and cavalymen, has a uniqueness rooted in history and tradition. You can be deservedly proud of where the Cavalry and Armor Force has been, where it is now and where it is going. We have undergone the greatest transformation since World War II — and have done it better than any force in history. We are, and will continue to be, the Spearhead for the Army.

**Forge the Thunderbolt!**

pared for platoon training meetings, and platoon sergeants for the company training meetings. Don't make the company commander or platoon leader base training plans on guesses! First sergeants must help the company commanders conduct useful training meetings by making sure meetings take place on schedule, and that everyone required to attend is there. First sergeants are also the "reality check" to make sure that training planned is completely planned, and that the training is doable with time and resources available.

Plan every training event as a multi-echelon training event. *FM 25-100* states "To use available time and resources most effectively, commanders must simultaneously train individuals, leaders, and units at each level in the organization during training events." At company level, make sure that the training plan includes platoon, crew, and individual tasks to be trained and assessed. Select a limited number of tasks to be formally assessed during each event, prepare and rehearse to conduct and assess each of these tasks, and review these preparations carefully in your pre-execution checks. Only a few individual tasks should be assessed during each collective task (try to train and check everything, and you will train and check nothing), but each must be assessed against the formal stan-

dard (often written in bullets on three-by-five cards in the tank commander's pocket).

Train to standard and AAR to standard. Be rigorous in executing the tasks, and in assessing how effectively you executed the tasks. Each leader should conduct his own informal AAR of his soldier's individual or crew tasks, and also bring those tasks into the formal collective AAR. Individual and leader task weaknesses are often at the bottom of collective task weaknesses. If the collective task did not go well, do it again. If the individual tasks were not executed to standard, retrain the soldiers and or leaders, and practice them again.

None of these steps is too hard, but none of them is "too easy." All of us are painfully aware of the distractors which work against effective training (certainly our senior leaders are; they are even aware that they themselves are sometimes the training distractors!). Let's stay in our lane, and fix what is within our reach. We can't fix the budget, or DA assignment policies. We can know what must be trained, track what must be trained, plan what must be trained. We can prepare to train, train to standard, and assess what must be retrained.

**"SERGEANT, TAKE THE LEAD"**

**Half Full...Or Half Empty?**

Some months ago, we published SFC Stephen A. Krivitsky's handy chart that helps crewmen report how much fuel is still on board in the M1's three fuel tanks. (See "Driver, How Much Fuel Do We Have?," Back Cover, Sept-Oct '96 *ARMOR*.) Some of his colleagues complained that it is not as important to know how much you have as how much you'll need to fill the fuel tanks again, so he recently created a new chart, reproduced here, that calculates how much fuel your tank will require to top up.

The method is the same: The driver reports the status of the right front tank, then the left front tank, and then the rear tank, as:

"Right front....one half. Left front....three quarters....Rear....one half."

The TC starts in the left column, moving down to one-half, then moves right to the next column, going to the three quarter fill line, and then moves to the right to the one half fill column, where he reads the result. In that case, 225 gallons will be needed to completely fill all three tanks.

		LEFT FRONT		REAR		
		E	1/4	1/2	3/4	F
E	EMPTY	505	443	381	319	257
	1/4	476	414	352	290	228
	1/2	450	388	326	264	202
	3/4	424	362	300	238	176
	FULL	398	336	274	212	150
1/4	EMPTY	467	405	343	281	219
	1/4	438	376	314	252	190
	1/2	412	350	288	226	164
	3/4	386	324	262	200	138
	FULL	360	298	236	174	112
1/2	EMPTY	430	368	306	244	182
	1/4	401	339	277	215	153
	1/2	375	313	252	189	127
	3/4	349	287	225	163	101
	FULL	323	261	199	137	75
3/4	EMPTY	393	331	269	207	145
	1/4	364	302	240	178	116
	1/2	338	276	214	152	90
	3/4	312	250	188	126	64
	FULL	286	224	162	100	38
FULL	EMPTY	355	293	231	169	107
	1/4	316	264	202	140	78
	1/2	300	238	176	114	52
	3/4	274	212	150	88	26
	FULL	248	186	124	62	0

**FUEL NEEDED**



## TACTICAL VIGNETTE 99-2

# The Passage at Wilcox

WHAT'S  
YOUR  
NEXT  
MOVE??



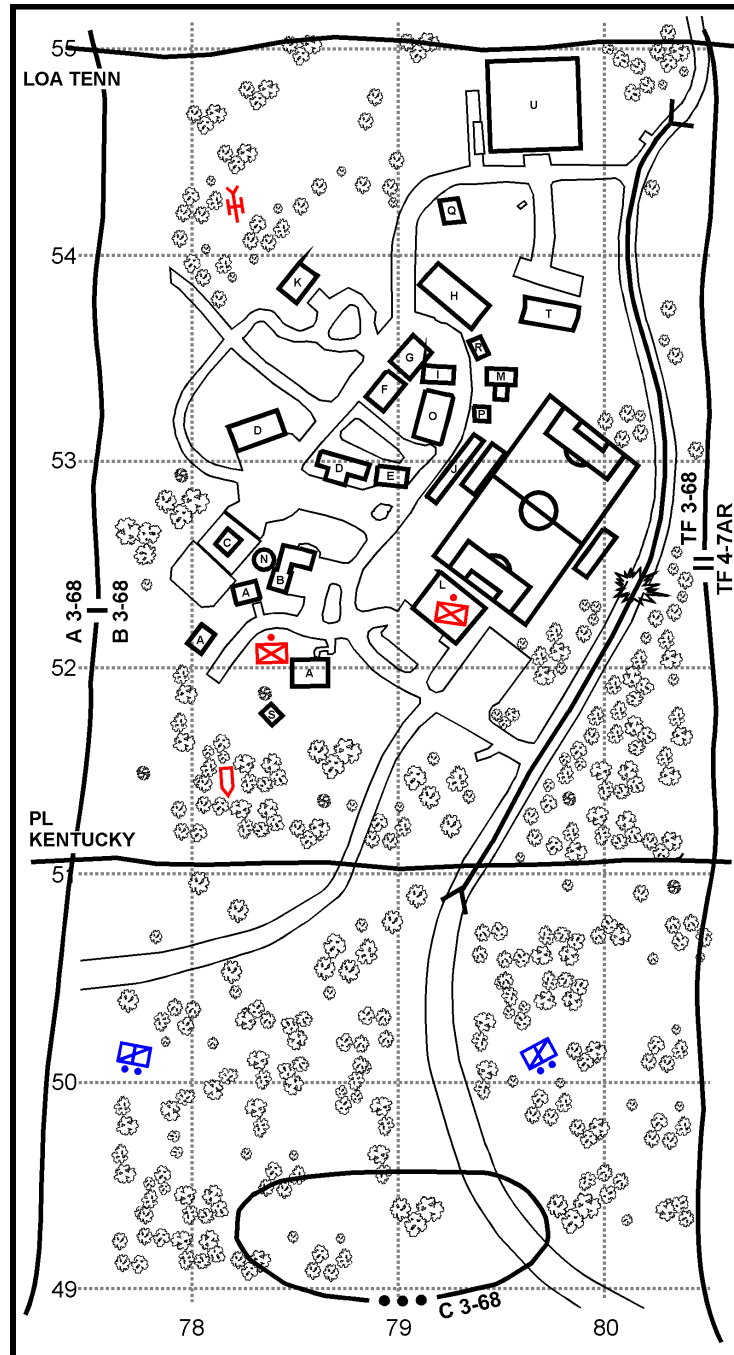
### SITUATION

You are the company team commander of Barbarians Team (mech-heavy), TF 3-68 AR. The task force, which is conducting a movement to contact, is composed of two armor company teams (Apache and Comanche) and one mechanized infantry company team (Barbarians). Your team consists of two mechanized infantry (BFV) platoons (1st and 3d Platoons), both at full strength, and one M1A1 tank platoon (2d Platoon), also at full strength. You also have an attached combat engineer platoon, consisting of four squads, two ACEs, and one AVLM. Your team has priority of TF mortars and FA.

The brigade commander's intent is for the task force to secure a passage lane to the east of the town of Wilcox, to vic 548886, for the follow-on unit (TF 2-72 AR). In turn, the TF commander's intent is for your team, the TF main effort, to clear a passage lane to PL TENNESSEE (the LOA) to allow the secure passage of TF 2-72 AR. Once battle handover has occurred at the passage point and TF 2-72 AR has assumed the brigade main effort, TF 368 AR will become the brigade reserve and prepare for future operations.

Prior to the mission, the brigade S2 provided the task force with a recent aerial photo of Wilcox (see attached aerial photo). Approximately three hours ago, the brigade's cavalry troop identified an enemy column moving into the town from the north; the column consisted of one T-72, two BMPs, and one ZSU-23-4.

As the operation begins, Apache Team is on your left flank and must seize OBJ 1 to prevent enemy reinforcements from reaching



- (A) RESIDENCE
- (B) GAS STATION
- (C) CHURCH
- (D) TOWNHOUSE
- (E) 7-11 STORE
- (F) OFFICE BUILDING
- (G) BUSINESS
- (H) 2-STORY HOTEL
- (I) BANK
- (J) OPEN AIR MARKET
- (K) EMBASSY
- (L) SCHOOL
- (M) FIRE STATION
- (N) WATER TOWER
- (O) BUSINESS
- (P) UNDER GROUND SEWER SYSTEM
- (Q) POWER PLANT
- (R) SUBWAY ENTRANCE
- (S) UNDERGROUND STORM SHELTER
- (T) WAREHOUSE
- (U) INDUSTRIAL PARK

Continued on Page 54

# SOLUTIONS — Tactical Vignette 98-6

*“Cobra’s Counterreconnaissance Fight,” from the November-December 1998 issue of ARMOR*

## Author’s Solution

“Guidons, guidons, this is COBRA Six. FRAGO follows, break...”

### 1. SITUATION

#### Friendly:

RED’s Alpha section engaged but did not destroy 1 BMP, last seen moving south vicinity grid WT086793. Alpha section has one vehicle with severe track damage, one vehicle stuck in a wadi, and a total of four wounded soldiers vicinity WT097786.

#### Enemy:

Scouts report:

- Two BRDMs are moving south on AA2 vicinity WT132809 at 0400.
- Four unidentified hot spots moving south vicinity WT095862 at 0400.

### 2. MISSION

No change.

### 3. EXECUTION

#### Commander’s intent:

No change.

#### a. Concept of the operation:

(1) **Scheme of maneuver.** Evacuate RED’s casualties, recover his vehicles, and destroy any known enemy vehicles in our AO, all in less than 1 hour. NLT 0500, start movement to PP CHARLIE. NLT 0530, have all elements passed through PP CHARLIE, signal engineers to close the lane, rearm and, refuel behind our BP, and be established in our BP ready to defend NLT 0600.

(2) **Fires.** Scouts have priority of fires to delay and disrupt enemy reconnaissance assets entering our security area. Send all calls for fire through me.

#### b. Tasks to subordinate units:

**RED 4:** Move your section as quickly as possible to recover your Alpha section vicinity CP 1 and evacuate wounded soldiers. Since you will be towing the disabled tank, you will be the last vehicle through the passage lane.

**WHITE:** Move toward CP 2. Find and destroy the two BRDMs identified by the scouts on AA2. Cross-talk with the scouts. Do not cross PL TENNESSEE without my permission.

**BLUE:** Send your Alpha section immediately and set vicinity CP 3. Orient N-NW. The BMP that engaged RED will probably continue to move south along the western wall. I will move with this section. Send your Bravo section to set vicinity CP 4. This section will serve as the safety net for the two BRDMs if they slip through WHITE. Cross-talk with WHITE to prevent fratricide.

**SCOUT 6:** Stay on my net and update reports on any enemy activity that your element identifies. You have priority of fires. Be prepared to call for indirect fires on all enemy elements you identify. You are my overwatch element. Cross-talk with WHITE and RED on their internal nets to conduct a video handoff of the BMP and two BRDMs. Update me frequently on those four hotspots, a possible CRP.

**COBRA BAND AID:** Move with me to vicinity CP 3. From there you will assist as needed in treatment and evacuation of casualties.

**COBRA 5:** Move to PP CHARLIE and control traffic flow there. Begin movement of the trains to the BP. Keep me informed of status. Ensure sappers are prepared to close the lane immediately upon our withdrawal. Get a status on WHITE’s fourth vehicle. We need to have it in the BP by 0600.

**COBRA 9:** Move the trains to our BP and conduct CSS operations from there. Coordinate for a hasty rearm and refuel there immediately upon our arrival at the BP.

#### c. Coordinating instructions:

Add the following additional graphic control measures to the current overlay, which remains in effect:

CP 1 – WT097786

CP 2 – WT130790

CP 3 – WT083763

CP 4 – WT130760

We must initiate our withdrawal NLT 0500, move all elements through PP CHARLIE NLT 0530, signal the engineers to close the lane behind our last vehicle, rearm and refuel behind the BP, occupy our BP, and be ready to defend with all vehicles NLT 0600.

### 4. SERVICE SUPPORT

No change.

### 5. COMMAND AND SIGNAL

**a. Command:** I will move with BLUE’s Bravo section and the medic PC to set vicinity CP 3. Keep me informed. We must cross-talk to prevent fratricide.

**b. Signal:** Far recognition signal is FM voice. Near recognition signal is two infrared flashes returned by three infrared flashes.

#### “ACKNOWLEDGE”

### RATIONALE

To meet the TF commander’s intent, you have one hour to successfully accomplish the following:

1. Destroy all enemy reconnaissance elements in your security area.
2. Recover your vehicles and evacuate wounded soldiers.
3. Withdraw your company team, and be prepared to defend from your BP with all of your vehicles.

The BMP and two BRDMs are most likely elements of the enemy’s regimental reconnaissance. The four unidentified hot spots are probably one of the combat reconnaissance patrols leading the enemy attack.

Scouts will maintain contact with the BMP and BRDMs as long as they can. You must get your killers in position to conduct a “video” handoff from the scouts before they lose contact with the BMP and BRDMs. The current “gap” between the hunters and the killers is too large. If scouts lose contact with the enemy before they can hand him off to the killers, the enemy may slip through unharmed. Depending on the terrain, you may not regain contact with the enemy until it is too late.

**NOTE:** The counterreconnaissance mission requires extensive IPB. It should be fought primarily as a defensive mission from positions of advantage along likely enemy avenues of approach; there should be sufficient depth and redundancy of observation and fields of fire within the security area. Therefore, the commander should position his elements to maximize coverage of likely avenues of approach and minimize the requirement for friendly movement. By minimizing friendly movement, the commander also reduces the risk of fratricide. Optimally, the hunters provide the killers with early warning (on their platoon in-



ternal net) and continuously track the enemy, providing real-time updates of enemy activity as he enters and passes through the security area. The hunters maintain contact with the enemy and conduct a “video” handoff to the killers, who destroy the enemy with a simple, gunnery-style defensive engagement. In this scenario, if the killers had been positioned vicinity PL TENNESSEE to engage targets on AA1 and AA2, and there was depth within the security area from the beginning of the operation, we would probably not be in this situation now.

Delegating specific tasks to each section allows you to conduct many tasks simultaneously.

1. You have the TF scout platoon attached to your company team. It has the capability of providing overwatch for your entire company team; use it to provide overwatch as you conduct your tasks and withdraw your company team. Since you have priority of fires, the scouts can also impede, harass, suppress, and possibly destroy enemy reconnaissance elements. Also, the activity and composition

for the four unidentified hot spots will most likely be designated as PIR for the TF commander.

2. Send RED’s Bravo section to recover its Alpha section and evacuate the wounded soldiers because it is closest and can be there quickest. If Bravo section encounters the BMP, it is capable of destroying the enemy vehicle, although this is not Bravo’s primary mission. The M88 is in the hide position and is too slow to move up, conduct recovery, and get back in time.

3. Send WHITE to destroy the BRDMs on AA2 because it is closest and can be there quickest. You need to conduct a “video” handoff of the BRDMs from the scouts to WHITE. If scouts lose contact with the BRDMs before they can hand them off to WHITE, the enemy may slip through. You may not regain contact with them until it is too late.

4. Send BLUE’s sections up to PL CAROLINA to add depth to your coverage of the security zone and to serve as a safety net in case the enemy slips through

RED and WHITE. The BMP will probably attempt to infiltrate south along the western wall to conduct reconnaissance of our defensive positions and obstacles. Therefore, position BLUE’s Alpha section against the western wall to block potential enemy penetration.

5. Bring the medic PC up with you and position it on PL CAROLINA. If RED has any urgent casualties, the senior aidman can transfer them to the medic PC and begin treatment while en route to the FAS. You are assuming risk by sending your 1SG and trains to the BP. If you take additional casualties or require additional recovery, you will have to conduct it without assistance from the 1SG or company trains assets if you are to meet your timeline.

6. Throughout this operation, especially upon withdrawal, cross-talk is a key factor in preventing fratricide. Position your XO at the passage point to control traffic, keep you informed, maintain communications with the TF, and coordinate with the engineers to close the lane after you have withdrawn.

## Passage at Wilcox (Continued from Page 52)

Wilcox from the west and interfering with the forward passage of lines for TF 2-72 AR. Comanche Team has cleared the enemy forces up to the 49-grid line and is in hasty defensive positions. On your right flank is TF 4-7 AR, whose mission is to secure an alternate passage point in its sector. The TF scout platoon, with six HMMWVs, is established south of Wilcox in three section positions, two of which are located in your zone vic 508778 and 504797. The other section is located within Apache’s zone.

Currently, the TF scouts report the situation in the town as two-dismounted infantry positions, each manned by approximately a squad-size element. One squad is located vic 518785, near an opening that is probably an underground storm shelter (S) and residences (A); the other is located vic 522792, in the school (L). The TF scouts have spotted two enemy vehicles: a ZSU-23-4 located vic 545784 and a BMP located vic 516799. The location of the other BMP is unknown. The TF scouts also report hearing a vehicle they believe to be the T-72; its current location is unknown. A road crater reinforced with wire and mines is reported vic 524803. The TF scouts report that most civilian residents have left the town, but that some seem to be hiding in their homes and in the town church.

### REQUIREMENT

Develop your COA and issue your FRAGO and any other reports you would submit. Readers who submit their solutions to the scenario should provide the following: FRAGO to the company team, the rationale behind your decision, and a sketch of your plan of action. E-mail your solution to this address: [armordctrine@ftknox-dtdd-emh5.army.mil](mailto:armordctrine@ftknox-dtdd-emh5.army.mil). Send your solution by regular mail to Platoon and Company Team Doctrine Branch, ATTN: ATZK-TDD-P, Ft. Knox, KY 40121-5210.

Solutions to this vignette will appear in the July-August issue of *ARMOR*.



# REVIEW

## His Career Spanned Three Wars

**Honorable Warrior: General Harold K. Johnson and the Ethics of Command** by Lewis Sorley. University Press of Kansas, 1998. 364 pages, \$39.95.

Very few soldiers actually get a chance to influence the decisions of a nation during crucial periods of peace and war. General Harold K. Johnson was a rare individual who participated in World War II, the Korean War, and the war in Vietnam. What kind of soldier survives the trials and tribulations of the Bataan Death March, the rigors of fighting on the Korean peninsula, and the divisive nature of the Vietnam War? Author Lewis Sorley emphatically argues that it is an honorable warrior, a man who came to his enormous responsibilities by traveling a "road of austerity, testing, and faith."

Sorley's second biography of a Vietnam-era Army Chief of Staff is enormously successful and instructive (he is also the author of *Thunderbolt*, the biography of General Creighton Abrams). Sorley is careful to balance the early career and trials of the young Johnson with the momentous events and decisions that would haunt his years as Chief of Staff of the Army from 1964-1968. The result is insightful, dynamic, and compelling.

Born in Bowsmont, North Dakota, on 22 February 1912, Harold K. (Johnny) Johnson graduated from West Point in 1933. When the Japanese invaded the Philippines in December 1941, he was the operations officer for the 57th Infantry (Philippine Scouts). Fighting in the valiant but doomed effort to stop the Japanese, Johnson survived the Bataan Death March, and more than three years in captivity. When the war in Korea erupted in June 1950, Johnson found himself commanding the 3d Battalion, 8th Cavalry, 1st Cavalry Division, rising quickly to command the 5th Cavalry Regiment during 14 months of tough combat. Rising steadily through the ranks, Johnson was selected as Army Chief of Staff by Secretary of Defense Robert McNamara in the summer of 1964. It is difficult to imagine a man more qualified to lead the Army at that time.

Sorley's themes throughout this superb volume are of Johnson's moral convictions and how his impeccable integrity guided him throughout his remarkable career. In Cabanatuan prison camp, Johnson was appointed commissary officer, a powerful position that he never used to his own advantage. His own self-denial and sacrifice in the war differed markedly with the "what's in it for me" attitude he encountered in the United States after liberation. Even though Johnson felt "let down" when there were no reinforcements for the Philippines, Sorley points out that he did not use it as an excuse for self-pity: "We sign up



with the basic knowledge that we may be called upon to defend the interests of our country wherever it might be." For Johnson, that next critical assignment was the command of a battalion and then a regiment in the Korean War. There was very little glory in his 14 months in Korea, with the burdens of command causing Johnson to spend "a great many nights on [his] knees" in prayer.

Of the greatest interest for most readers, however, are the years 1964 to 1968, when Johnson served as Chief of Staff of the Army. McNamara's account of those years, *In Retrospect*, describes Johnson as a soldier with "an iron will, extraordinary toughness of mind and spirit, and a fierce integrity." (p. 176) Sorley shows the reader that this description is true. How then, could Johnson support policies that were so tragically flawed and doomed to failure? Sorley builds a compelling portrait of a man in turmoil; a man caught in the vortex of a war that was consuming the Army, the institution he had served since 1933. Convinced that General Westmoreland's search and destroy tactics were not working, and could not work in Vietnam, Johnson was "unable to get them changed." The author points out that even though he disagreed with what was going on in Vietnam, as Chief of Staff, Johnson found himself validating and praising these same efforts. This dilemma leads to one of the most tantalizing episodes of the Vietnam War. Were the Joint Chiefs, and Johnson in particular, willing to resign *en masse* in protest to the administration's handling of the war?

Sorley answers the question about the chiefs of the other services tangentially, but he sheds new light on Johnson's feelings concerning such a monumental decision. In an interview with the author, General Earle G. (Bus) Wheeler's widow opines that it was Johnson who first talked of resigning to protest the conduct of the war. Wheeler, it seems, talked Johnson and the other Chiefs out of

such a drastic move, likening it to a "mutiny." As for Johnson himself, later in his life he confided that he made a great mistake in not resigning, calling his decision to remain as Chief of Staff and not resign as "a lapse in moral courage." The great strength of this book and Sorley's account of Johnson's life does not lie with this episode or the Vietnam War, but in the many applicable lessons that are to be gleaned from nearly every chapter.

Johnson delineated three insights he gained from being a commander: 1) If you could command successfully at battalion level, you could command larger formations successfully; 2) Foremost among commanders was the welfare of the men they commanded; and 3) The commander has an obligation to improve his technical and tactical competence. During his tenure as commandant of the Command and General Staff College, Johnson urged his students to, "challenge the assertion," alluding to his own mistrust of the idea that the Strategic Air Command and nuclear weapons could deter war. Johnson came to the conclusion that "bombs don't accomplish very much in the end." Are we seeing the same sort of "strategy" today? Johnson was adamant that it was impossible to solve problems on the ground by merely over-flying resistance on the ground.

Sorley has done a magnificent job of detailing the life of a remarkable American and soldier. He epitomized the ideals we all look for in ourselves and in the officers of the armed forces. Johnson himself summed up the professional values that are essential in any officer, the 4 I's: Intelligence, Imagination, Initiative, and Integrity. General Harold K. Johnson lived those values. Lewis Sorley's book is a testament to this outstanding soldier and American patriot.

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**The Serbs: History, Myth, and the Destruction of Yugoslavia** by Tim Judah, Yale University Press, New Haven, Conn., 1998. 320 pp. Maps, photos, notes, appendices, and index, ISBN: 0-300-07113-2 (cloth), 0-300-07656-8 (paper). \$35.00 (cloth), \$16.00 (paper).

That the interests of the European states and America in the 20th century have been bookended by the barbaric actions of members of the Balkan states makes Mr. Judah's book about Serbian history both timely and an interesting read, especially since problems in Kosovo are once again on the international stage.

Mr. Judah has organized the book in roughly chronological order, starting with a summary of how the Balkans were settled in the sixth century by Slavic raiders who occupied deserted areas that had been depopulated by warfare. Indeed, the theme of great migrations of people is the principal story of this book, as throughout history the Serbs, Croats, Bulgarians, and other tribes fled from each other or whatever conquering army was on the march. He traces the history of the Serb nation from its humble beginnings as the Serbs made the transition from raiders to settlers and became separated from the Croats in geography, religion, and dialect, as the Orthodox Church worked with the Serbs and the Roman Catholic Church proselytized the Croats. This division would have repercussions into modern times. But, for the Serbs, Mr. Judah writes that the Orthodox Church became the preserver of Serbian culture during its subjugation by the Ottoman Empire.

Before the Ottoman conquest, however, Serbia reached the zenith of its power in the ancient world with the accession of Stefan Nemanja in the 1160s, who created a Serbian Empire that was to last for two centuries and become a major military power in the Balkans. The Nemanjic Kingdom came to an end at the Battle of Kosovo in 1389 between the Serbs and the Ottoman Turks and the country was overrun in 1459.

Then, for approximately the next 400 years, Serbia was tributary to the Ottoman Empire, but the Orthodox Church preserved the legend of the Nemanjic Dynasty, and the Battle of Kosovo entered into folklore. Indeed, as Mr. Judah rightly points out, the importance of the Battle of Kosovo cannot be overemphasized as a cultural marker for the Serbians. The assassination of the Archduke Franz Ferdinand in Sarajevo that launched World War I was carried out on the 525th anniversary of the Kosovo Battle and, closer in time, it was on the 600th anniversary in 1989 that Slobodan Milosevic became president of Serbia and launched his country into the disastrous war of 1991-95.

After he brings the reader to the modern era, Mr. Judah then explores the unification of Yugoslavia under Marshal Josip Tito, how the country fell apart in the '80s, and the Serbian actions that led to the war in Bosnia and Croatia and the eventual U.N. intervention. Throughout all of this, Mr. Judah explains the

great migrations of people into and out of the Balkan countries as they conquered or were in turn conquered and the brutal acts that conquerors perpetrated against their foes, so that the atrocities committed in the most recent conflict are seen to be but the latest expression of nationalized hatred.

The chief fault of the book is that it assumes a more than casual knowledge of Balkan history. Indeed, the non-historian reader can soon become bogged down in the names of historical persons and their various alliances. The maps are not very well done either. They are lacking in terrain references and are oddly placed in the text. I also felt that Mr. Judah's extensive use of population charts in the text when talking about the migration of people was distracting.

Overall, though, *The Serbs* is a very well-researched and well-written book. Mr. Judah was the Balkans correspondent for the *London Times* and *The Economist* who covered Romania, Bulgaria, Albania, and the former Yugoslavia, so he is very knowledgeable about his subject. He injects many personal stories into the narrative from interviews with the principal players and the common people in order to provide a comprehensive picture of what happened in Serbia and Bosnia. I would recommend this book as an excellent reference to explain the motivation and actions of the Serbian leaders and people.

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**Encyclopedia of the Vietnam War: A Political, Social, and Military History**, edited by Spencer C. Tucker, ABC-CLIO, Inc., 1998. 3 Volumes, 1196 pages. \$275.00, hardcover.

The United States' longest, costliest, and most divisive war, the Vietnam War, can be viewed as our national epic, its story our own *Iliad*. And now, amidst the popular outpouring of memoirs, histories, novels, and films, comes this largest and most comprehensive presentation of a complex history that will forever be known as the Vietnam Experience.

The editor of this encyclopedia, Spencer Tucker, is a noted historian who teaches military history at the Virginia Military Institute. He has written nine books on military and maritime history, including subjects on the Civil War and World War I. Now he spearheads the efforts of 135 contributors in a scholarly and well-researched work that details the full spectrum of the Vietnam War and its impact, politically, socially, and militarily, on Vietnam and America. Most of the contributors are American academics, with a few military personnel and Vietnamese authors.

These three handsome volumes contain over 980 entries, A to Z, with over 10,000 separate references listed in the index. Maps, photos, charts, tables, a bibliography, a chronology of events, and a useful glossary all complement the historical and biographical entries. In addition to covering people, places, events, weapons, tactics, strategies, battles,

policies, and attitudes, the encyclopedia also presents over 200 documents (in Volume III) revealing controversial French and American policy, and the gradual evolution of the Vietnamese revolutionary movement.

Following a disappointingly self-serving, "I told you so" foreword by Admiral Elmo Zumwalt, Tucker provides a short but succinct overview of Vietnamese history as a most suitable introduction into the whole subject of the Indochina conflict. To fully understand the scope of the war, Tucker has wisely included numerous entries reflecting early French colonial rule, and even earlier contentious relations with neighboring China. He correctly states that "history cannot be understood in isolation" and that "if any war clearly demonstrates the need to study history, it is the Vietnam conflict."

With such an expansive subject, viewed through time, perspective, and the hindsight of history, it is no surprise that some biographical entries are revealing as much for what is written as what is not. President Johnson's entry is plain vanilla, with no mention of his being the Great Meddler in the tactical conduct of the war. Secretary of Defense Robert McNamara is tagged with much of the responsibility for the war's failure, for he "misunderstood the nature of the conflict." Ho Chi Minh receives high praise as a revolutionary and as a statesman, while President Clinton is pilloried for his collegiate anti-war sentiments and for dodging the draft. General Westmoreland's bio seems balanced, but is too brief to really appreciate the man. And North Vietnam's General Giap is correctly depicted as a master of tactics, strategy, and logistics, but also as a political uncertainty that the Hanoi government kept a close eye on. Lesser, more colorful figures appear, too, such as Lucian Conein, a CIA spook code-named Black Luigi, who operated an intelligence network in North Vietnam.

The superb entries on battles, artillery and artillery doctrine, riverine and naval warfare, the massive U.S. air war, and weapons are supplemented by information little known to the public. Defoliation efforts involved not just Agent Orange, but five other color-coded, toxic herbicides. Intelligence and counter-intelligence entries reveal the basic "cloak and dagger" operations, plus the use of secret Spike Recon Teams, Hatchet Forces, SLAM companies (seek, locate, annihilate, monitor), and clandestine Road Watch Teams deep within Laos. Several of the documents in Volume III show critical U.S. involvement in the bloody coup that toppled the Diem regime in 1963. And, while the subject of atrocities is covered, there is no entry on military justice or the laws of war and their application during the war.

This encyclopedia provides a clear, well-organized approach to the study of the complete history of the Vietnam War. However, since it is burdened by the encyclopedic style of writing and its A to Z format, it would be most useful as a companion to any number of excellent historical narratives such as Stanley Karnow's *Vietnam* (1984), Phillip Davidson's

*Vietnam at War* (1988), or Wilbur Morrison's *The Elephant and the Tiger* (1990).

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**Taking the Offensive: October 1966 to October 1967** by George L. MacGarrigle, Center for Military History, U.S. Army, Washington, D.C., 1998; 443 pages, maps, bibliography, index; \$44.

This book is one of a series on the Vietnam War and it covers the beginning of the U.S. Army's offensive operations from late 1966 to late 1967. The build-up had been essentially completed (though GEN Westmoreland wanted more troops) and COMUSMACV said this was to be the "year of the offensive." He intended that, finally, the thrust of the war would be reversed, that the combined forces would strike the Viet Cong and the North Vietnamese, pin them down, and inflict such heavy losses that the war might end. He "assumed that the highly mobile American units could bring the ragtag enemy forces to battle and defeat them with superior firepower."

So much for high hopes! "At a 28 August [1966] commanders' meeting in Nha Trang, Westmoreland and his principal staff officers...duly noted statistical advances in the official "measurements of progress," which included an estimated enemy attrition rate of 7,000 per month, but had no evidence to indicate a decline in overall enemy strength or capabilities." There wasn't any.

Secretary of Defense McNamara had posited a philosophy that there are things which can be objectively measured and those that can be only subjectively assessed, and it falls on each of us to discern the difference and evaluate programs accordingly. With the arrival of U.S. troops in Vietnam, MACV began to demand various statistics to determine the success or failure of its programs. As the author points out: "The specific approach of Washington's leaders to the struggle in Vietnam emphasized statistical results..."

The text reflects this: almost every action description ends with a listing of the dead found on the ground and the weapons recovered. After numerous pages of this, you begin to wonder what this recitation is about. And, at the end of this book, MacGarrigle quotes McGeorge Bundy, the President's national security advisor, who warned that both the military and the administration had overemphasized statistics as an indicator of success in Vietnam.

This book is almost like a diary, a listing of daily and weekly events in each corps area, who ran into whom, how the action ended, who suffered which casualties, etc., etc. The book is broken down, logically, into actions in each corps area, and discusses briefly each major operation and some of the minor actions involved. (There are 57 major operations described.) There are some maps, but not enough for the historical tactician. But this

book is mostly about Westmoreland's strategy and how it was carried out.

There is an analysis at the end of each chapter, giving a broad view of the overall campaign, but almost no analysis of small unit actions — why a platoon leader or company commander succeeded or didn't. This may be the result of limited space, but the *ARMOR* reader will miss it. An exception is the description of the battle of Ong Thanh, a disastrous calamity for the 2d Battalion, 28th Infantry, whose men "fought well under extreme circumstances... taking more casualties in a single action than any other battalion under [General] Hay's command." Reading that part takes you right into the battle. All the way through the book, the reader gets an increasing feeling that things were not going well, despite fine planning and courageous soldiers. The American politicians and senior officers simply failed to understand the determination of the North Vietnamese and their willingness to absorb terrible losses to realize their goals, "Hanoi was willing to pay whatever price to see the war through, a resolve that Washington did not share."

The author is quite candid in his judgment of the South Vietnamese government; of the refugee problem in Quang Ngai, he writes: "Saigon's overburdened, inefficient, and often corrupt administration lacked the ability, and at times the will, to improve the refugees' condition." And, in Long Huu, the "government forces were unable to provide security, and their thefts of produce and poultry alienated the villagers. Government cadre carried out their programs indifferently..."

The book has numerous lessons learned, but you have to look for them. One of the more important is on page 230: "The brigade also lost 15 of 18 key officers, including [the brigade commander] and all three battalion commanders. This 'revolving door policy,' which guaranteed the rapid rotation of officers in combat commands, was later criticized as representing careerism at its worst. It destroyed any prospect for continuity of command, it hurt field morale among the enlisted ranks, and it ultimately lessened the effectiveness of U.S. forces." This is a lesson we need to review regularly because too often personal ambition clouds our judgment of what is best for the Army.

Secretary McNamara later wrote to the President: "Nothing can be expected to break [the communists'] will other than the conviction that they cannot succeed." While the North Vietnamese and the Viet Cong suffered terrible casualties in 1966-67, they never lost their belief that, over the long haul, the Americans would give up and they would win. Statistics notwithstanding, they were right!

Personal note: I was surprised at the high number of individuals named in the book that I know and have served with in some capacity. Reading about your friends and places where you worked in a "history text" does little to make you feel young!

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**The Canadian Kangaroos in World War II** by Kenneth R. Ramsden, Ramsden-Cavan Publishing, 1701 Stewart Drive, RR3, Cavan, Ontario L0A 1C0 Canada. ISBN 0-96996-97. Softback, 200 pages. Available direct from the author, price \$16.95 plus \$3.00 postage etc. in Canada. Overseas, send an IRC for details.

Among the innovations the Second World War brought onto the battlefield was the use of armored personnel carriers to carry infantrymen into battle with the same levels of mobility and protection as tanks. Early half-tracks went some way toward allowing the foot soldier to advance under fire, but both German and American designs were not well armored, nor always as mobile as the tank they were to accompany. Britain's carrier series were mobile enough, but still not well protected and far too small to carry more than a handful of men. The true breakthrough came in August 1944 during the Falaise breakthrough when redundant Priest self-propelled guns, withdrawn when Canadian regiments who used them during the D-Day landings converted to towed 25pdr guns, were hastily modified and used with great success.

To man these vehicles, a new unit was formed from a variety of sources, which finally became known as the 1st Canadian Armoured Carrier Regiment. The unit and its vehicles were initially classified "Secret," so much so that when they were assigned a Regimental padre, it took him a week to find his unit. The troops did get regular mail, however, and their success in reducing infantry casualties was such that they were expanded and a British tank regiment was re-equipped along the same lines.

The regiment fought, literally in the vanguard, in many major and minor actions as the 21st Army Group advanced across France, Belgium, Holland, and Germany. It scored many notable firsts, and became the only Canadian unit in the British 79th Armoured Division. With the war in Europe won, it was disbanded and as such passed into history. Its deeds are mentioned in passing where they affected the course of events, but apart from a small regimental history produced for its members, its full story has not been laid down until former member Kenneth Ramsden produced this account. It covers the regiment and its actions from beginning to end, drawing on the unit's original war diary and recollections of those who were there to give a long overdue and detailed account of this unique unit.

Development of tactics, organization and equipment is interwoven with the battle accounts and details of the regiment's progress. The initial rush to produce the first converted Priests, and the changeover to Ram Kangaroos, which gave the unit its cap-badge and this book its name, will be of great interest to anyone interested in these unusual machines. While not technical in style, close reading will give a lot of pointers as to how the vehicles looked. Some photos of the Ram Kangaroos



are among the illustrations, although none of the Priests, and there are several of the other 79th Armoured Division vehicles which, though good in themselves, are not strictly relevant to the story.

That small drawback apart, the account here makes for fascinating reading, with several unusual things brought to light. We now know why there was a sudden demand for uniforms in small sizes, and what lengths the unit's signals and maintenance sections went to provide radios and keep the vehicles running, including an unusual use for an 88mm gun trailer. Progress can be followed with clear maps, and those members of the regiment who died or were wounded are listed. A bonus is the inclusion of the text of the original history booklet, and its list of those units carried by the regiment into action.

Like a number of units raised during the war and disbanded soon afterwards, the story of the 1st Armoured Carrier Regiment should have been told a long time ago. Outside the small circle of AFV enthusiasts and modelers, they are all but unknown. That situation has at last been resolved; we can now know their story, and they themselves will be able to know that their efforts are not forgotten.

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**The Desert Fox in Normandy: Rommel's Defense of Fortress Europe** by Samuel W. Mitcham, Jr., Greenwood Publishing Group, Westport, Conn., 1997, 256 pp. \$26.95 (hardcover).

*The Desert Fox in Normandy* gets off to a slow start. The book begins with the usual acknowledgements of Rommel's genius in North Africa (was he really brilliant, or was Montgomery responsible for "The Desert Fox" legend?). Mitcham also slips in a few unnecessary comments on the state of liberal education in America and an attack on another author's critical writings about Rommel.

Despite the slow start, *The Desert Fox in Normandy* picks up steam and provides some insights into how and why the Germans lost at Normandy. The book is at its best when discussing the German plans, operations, and reactions to Allied maneuvers.

Several excellent quotes support the author's contention that among the Nazis, Rommel understood the Western Allies best (especially his appreciation of close air support). He was clearly the most capable German available to defeat the Allied invasion.

Both sides lost opportunities at victory, particularly early on. Rommel's famous absence on June 6th combined with Hitler's decision to withhold the reserves, ensured defeat. By the 10th of June, with local counterattacks thwarted and Allied air wreaking havoc on German movement, all real hope of forming a sizeable counterattack force and pushing the Allies back into the sea was lost. From then on, the Germans began their brave yet ultimately futile attempt to contain the enemy in the Cotentin Peninsula.

The last half of *The Desert Fox in Normandy* contains descriptions of the increasingly desperate measures Rommel and his subordinates took to stave off defeat. The book gives an appreciation of the tenacity of the German soldier, and made me believe that the time it took the Allies to finally break out of hedgerow country had more to do with the competence of the average German infantryman than with Rommel's genius.

More translations of Rommel's orders and dispatches, if they exist, would have been especially insightful. In addition, more detailed maps would have helped to explain many of the operations.

Mitcham's use of "mini-biographies" on several of the lesser German players involved in the battle proved helpful. He also presented a good (but somewhat irrelevant) account of Rommel's involvement in the plot to kill Hitler.

*The Desert Fox in Normandy* would serve as a suitable companion to Stephen Ambrose's *Citizen Soldiers* or other books detailing the Allied version of the Battle of Normandy. The book does a good job of presenting the battle from the German operational view. It showed how desperately the Germans — Rommel in particular — tried to defeat, then to contain, the Allies in Normandy.

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**The Tanks at Flers** by Trevor Pidgeon, Cobham, Surrey, United Kingdom: Fairmile Books, 1995. 247 pages (Volume 1) with accompanying map collection (Volume 2), \$69.00.

All histories have their start somewhere, and for all tankers, our history began on 15 September 1916 with the first combat use of the tank at the battle of Flers-Courcelette. When the 36 British tanks of the nascent Heavy Section, Machine Gun Corps attacked the German trenches on 15 September, the nature of ground warfare forever changed. While the tanks' performance on that day was uneven and dubious, those first hesitant steps foreshadowed the possibilities of mechanized combat. In *The Tanks at Flers*, Trevor Pidgeon has succeeded in creating a well-written, extremely detailed, and commendably researched narrative of the battle. Pidgeon's work is the most complete and comprehensive account of the tank's battlefield debut yet published.

The great strength of *The Tanks at Flers* is in the detail in which Pidgeon dissects the tanks' actions during the day. In most cases, Pidgeon was able to sort and analyze a host of often conflicting spot reports, official histories, and personal narratives of the battle to determine the actions and accomplishments of almost all of the individual tanks involved in the assault. This "worm's-eye" view of the fighting not only provides the reader with an increased appreciation for the "face of battle" in the First World War, but also, for our techno-centric Army, a compelling historical example of the uses and limitations of new weapons systems. One of the more interest-

ing aspects of the book is Pidgeon's analysis of how the Germans and the British scrutinized the battle in an attempt to "make sense" of the threat posed by, or possible uses of, the new war machine.

*The Tanks at Flers* is superbly illustrated with photographs and drawings from the period. Volume II of the book contains twelve reproductions of the British trench maps used at the time of the battle with annotations by the author to assist the reader in following the flow of the fighting. Each chapter in Volume I also contains an extremely useful "Field Guide" that allows today's visitor to the battlefield to link the historical narrative to the present lay of the land. Units wishing to conduct a staff ride of the battlefield would find the map set and "Field Guide" invaluable to understanding the actions of the day.

*The Tanks at Flers* is a unique account of a long ignored aspect of the First World War and the development of armored warfare. The book provides the scholar and military professional an insight into the difficulties of the wartime production and fielding of a new weapons system, a better understanding of combat in the First World War, and an appreciation for the tanker-pioneers from which all modern armor soldiers have descended. It should be remembered that while mechanical difficulties and technological limitations prevented the tank from becoming a critical weapon in the First World War, their use on the Western Front at Flers and other battlefields provided fertile ground for the imaginations of military thinkers and armor enthusiasts like J.F.C. Fuller and George Patton.

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**Eisenhower: The Pre-War Diaries and Selected Papers, 1905-1941** by Dwight D. Eisenhower, edited by Daniel D. Holt and James W. Leyerzapf, Introduction by John S. D. Eisenhower, published by The Johns Hopkins University Press, 1998, \$45.00 hardcover. 612 pages, 18 illustrations.

As a military historian, I have had several opportunities to conduct research using primary documents such as official battle records, maps, archival materials, and diaries and personal papers. Any researcher would do well to approach the latter category — given these documents' personal association and importance to the historical figure — with a certain sense of skepticism based on the inevitable bias that must, in one form or another, appear. I myself have often wondered what it is that makes a person take the time to record thoughts on a regular basis in a diary. Is it a sense of destiny that he or she feels at an early age? Or is it perhaps that the act of physically capturing seemingly mundane daily thoughts serves as a means of self-examination or reflection? For whatever reason, personal diaries and papers can prove valuable to the historian and student of human

behavior alike, if the reader places the document in its proper context. Students of Dwight D. Eisenhower will welcome the recent publication of his pre-war diaries and selected papers as an opportunity to develop a clearer understanding of what this soldier thought before he became the historical giant we regard him as today.

This collection, edited by the director of the Dwight D. Eisenhower Presidential Library in Abilene, Kansas, begins with an introduction by John Eisenhower that serves to place the book in its proper historical context. The six chapters that follow (the first chapter consists of diary entries from 1905 to 1926, with the remaining five chapters covering the period 1928 through December 1941) provide a remarkable perspective on Eisenhower's development as a young soldier serving in the pre-World War II Army. These entries take the reader on a journey from Eisenhower's graduation from West Point, through his service in the early tank corps, to his service as a member of MacArthur's staff in the Philippines. To quote the book's cover jacket, "[these] five diaries, personal and family letters, official military correspondence, speeches, published writings, and reports... offer the most compelling evidence yet of the impressive range of Eisenhower's experiences between the wars."

This collection of studies, reports, personal letters and diary entries serves to balance the "official" Eisenhower with the less-widely known, reflective family man. Space limits me to two examples. Early on in the book there appears a rather detailed discussion of the capabilities of the tank, written as an article for the November 1920 issue of *Infantry Journal*. Don't be misled by the date — young officers of all branches would do well to read it today, for in principle Eisenhower's comments are still valid. Yet this example is countered in the book by a personal letter, poignant in its brevity and sincerity, written by Eisenhower just two months after the *Infantry Journal* article. The letter extends the Eisenhower family's thanks to the commanding officer of the unit to which Eisenhower was then assigned for the soldiers' sympathies and flowers on the occasion of the death of young Doud Dwight, their 3-year-old first born son. What impresses me most about this collection is the opportunity it provides for the reader to see, through Eisenhower's own writings, both sides of a man we generally regard as larger than life. Here is revealed the human side of a soldier as he worked to develop his decision-making skills and served in duty assignments that brought him into contact with America's rapidly developing military-industrial complex.

We as professionals are fortunate that Eisenhower made the personal effort to record his thoughts in his diaries. The editors of this latest edition to the Eisenhower historiography provide us with materials we can use to develop our own assessment of this important figure. I recommend strongly the addition of this work to the collection of any officer or military historian who seeks a more intimate understanding of the man the world knows as "Ike."

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**The Deadly Brotherhood: The American Combat Soldier in World War II** by John C. McManus, Presidio Press, Novato, Calif., 1998, 353 pages, \$28.95, hardcover.

For those of us tired of works about tactics, strategy, and major personalities of World War II, this book provides a breath of fresh air. The author truly "gets down in the weeds," describing World War II combat at a very personal level. There is little mention of leadership above battalion level. In fact, the index does not list Generals Eisenhower, Montgomery, or MacArthur. Only one mention is given to General Patton. *The Deadly Brotherhood* focuses on the men who faced combat day in and day out. We hear only infantrymen, tankers, combat engineers, and Marine riflemen tell their stories in their own words through exhaustive use of interviews, diaries, and manuscripts. From food, equipment, and weapons to environmental conditions and becoming a casualty; the author provides all the nitty gritty detail that often is lacking in other works. We hear the soldiers' words describing their own feelings towards the enemy and their reasons for getting out of their foxhole day after day to make another advance. We learn not about tactics and techniques but about constant, grinding combat and its effects on individuals. It is the first book I have read that deals entirely with the frontline soldier and his combat experience.

*The Deadly Brotherhood* is meticulously researched and written. Forty pages of notes and a seven-page bibliography attest to Mr. McManus' professionalism and experience as a writer and scholar. This is not a dry scholarly work, however. I found the book very readable and fast paced. With two parts divided into twelve chapters, the work is well organized and follows an orderly progression that experienced and casual military history readers alike will easily follow. Thirty-two black and white photographs reinforce the text well. There is not a single portrait of a field grade or general officer. I think that both the military professional and casual reader will enjoy this book because of its strict focus on the combat soldier's experience. I strongly recommend that warriors of any variety read this book. It is an excellent reminder for those of us who have not experienced combat that, in war, soldiers suffer extraordinary pain, deprivation, fatigue, and stress, as well as the constant threat of death and wounds.

CPT MATTHEW BOAL  
Ft. Knox, Ky.

**The Bear Went Over the Mountain, Soviet Combat Tactics in Afghanistan**, Lester W. Grau, editor, Frank Cass Publishers, London, 1998. 220 pages, \$52.50 (hardcover).

The Soviet war in Afghanistan has not yet received the attention it deserves from military professionals, especially here in the United States. As the Cold War recedes from mem-

ory and we face the prospect of peacekeeping, nation-building, and peace-enforcement around the world, the hard lessons of this nasty war may prove useful to American soldiers who find themselves in places like Haiti, Somalia, and Bosnia.

Lester W. Grau's *The Bear Went Over the Mountain, Soviet Combat Tactics in Afghanistan* is an attempt to present those lessons from the point of view of both the Soviets and the editor. Since the end of the Cold War, western scholars have had increased access to Soviet archives of all types, including military historical and operational studies. This book derives from such a study conducted by the Frunze Military Academy. The faculty there attempted to capture lessons learned at the small unit tactical level from the officers who participated in these actions. This book is an edited translation of that study, similar to the historical and "lessons learned" studies produced for our army during and immediately after a conflict.

The book's chapters are organized by topics, with several historical vignettes presented within each topical area. Topics covered include blocking and destroying guerrilla forces, the offensive in populated areas and mountains, and march and convoy escort. Comments by the Frunze Academy faculty and by the editor, a retired American Infantry and Soviet Foreign Area officer, place the actions in context and suggest some of the lessons to be taken away from these stories. Since the book describes unit actions generally at the battalion level and below, junior officers and NCOs should find these stories professionally educational. Armor leaders will be interested in the Soviets' use of armor and mechanized forces in difficult terrain against the light, irregular Mujahideen. Finally, these "snap-shots of combat" illustrate that the Soviet (and presumably Russian) military was more adaptive and less doctrinaire than commonly believed.

Unfortunately, since the book originated as a sort of after-action report, it frequently reads as such and is mostly devoid of personal insight and feeling. The book's clinical style makes it an unlikely candidate for simple pleasure reading. The maps, while plentiful, use Russian graphics and are sometimes oddly oriented, instead of following the common practice of orienting north toward the top of the page.

Nonetheless, this book offers valuable professional insight into the Russian military's tactics and operational art, and their ability and willingness to innovate. Intelligence and operations officers might find the vignettes an excellent source as they design wargame and training scenarios in preparing units for deployment. Since it is likely that we will continue to find ourselves as peacekeepers/enforcers around the world, studying the Soviets' military experience in Afghanistan may provide useful lessons.

LTC STEVEN C. GRAVLIN  
Inspector General, USA TACOM  
Detroit Arsenal, Warren, Mich.



**West Front** by Talonsoft. Requires IBM PC 133mhz Pentium, Windows 95/98, 16MB RAM, SVGA graphics, 4x CD-ROM drive, mouse. \$54.95.

*Reviewed on: IBM 133mhz Pentium with Windows 95, 48 MB RAM, 4x CD-ROM drive.*

The sequel to Talonsoft's *East Front*, and heir to Talonsoft's renowned *Battleground* series of computer games, *West Front* did little to live up to the hype that has surrounded it and its predecessors. *WF* is a turn-based tactical level simulation of WWII ground combat. Icons represent platoons, individual vehicles, and crew-served weapons. The scale is 250m per hex, 6 minutes of real-time per turn.

First impressions do go a long way, but there must be substance to back them up. Upon first opening *WF*, I was impressed by the 256-page manual (I hate on-line manuals; if you pay enough for a game, it should have a hardcopy manual, but I digress). After loading it, I was equally impressed with the excellent quality of the terrain map and units, which are modeled on actual micro-armor models. Both 2D and 3D views allow you to view the battlefield from many perspectives. All of these are strengths found in both the *Battleground* and *Campaign* series of games from Talonsoft. Martial background music and background battlefield sounds complete the ambience.

The game comes with a tutorial and several "basic training" scenarios, which quickly introduce you to the mechanics of the game and its interface. Both the interface and the mechanics are exactly what the designers intended them: a precise way to control the aspects of fire and movement for every unit you have on the battlefield. This is not a problem with the smaller scenarios, but it is as you progress to the larger ones, where you must personally control the movement and firing of up to a hundred or more units.

There are options to move units by organization, but the AI tends to move units along paths that you would not take, often exposing them to fire from spotted enemy units. So you must individually move each unit. There is also a flaw in the relationship between fire and movement, in favor of movement. In a turn that represents six minutes of real time, the average unit can fire twice if it doesn't move, but a typical tank can cover 2500m over open ground, which often allows you or the enemy to unrealistically maneuver.

While there are flaws in the game mechanics, the biggest problem I have with *WF* is that it simply takes too long to play. This is not due to the computer or the AI, but due to the necessity of issuing so many orders while individually moving each unit. If you do buy and play this game, I would recommend playing the tank battle scenarios which do not become as bogged down as the infantry battles. Another problem is that the game mechanics reward tactics that take advantage of the system, not real WWII tactics. You find yourself fighting the game rather than a real WWII opponent.

*WF* contains a campaign game and a very good scenario editor, all of which are miti-

gated by the poor playability. Overall, I would not recommend *WF* to the average reader of this magazine. Those with a specific interest in the period or setting, or those who like the *Battleground* and/or *Campaign* series of games, may like this game, but I did not. I also did not like the *Battleground* series or *EF*, so this may be a matter of personal preference.

JERRY A. HALL  
CPT, Armor  
Fort Carson, Colo.

**Tank Platoon Operating System (TPOS)** by David Rennaker and Marc Sanborn. Published by BowTech Inc., Vine Grove, Ky., 1998. \$65.00.

*FM 25-101, Battle Focused Training* states that "Leaders are responsible for identifying and training essential soldier tasks that support the unit's mission essential collective tasks... [leaders] must fully understand the unit's collective tasks and how soldier tasks are planned, trained, and evaluated." Exactly how does a tank platoon leader learn to read a company METL and decide what collective tasks are in support? Currently, the Armor Officer Basic Course POI includes an eight-hour block of instruction entitled "Train the Force" that does, in a limited way, discuss the highlights of *FMs 25-100* and *25-101*. Unfortunately, a detailed understanding of the ARTEP manual and its included crew collective and individual tasks is not included. Eighteen months of senior instructor experience has shown me that a newly assigned lieutenant, thrown into the Training Management cycle, has no clear response to his commander's question: "What does your platoon need to train on?" — whether that training be an STX or Sergeant's Time.

Enter *TPOS* — the single Leader Book production program available utilizing an *MS Access* Jet Database Engine. Talk to one of the authors, a successful tank platoon sergeant, and he will tell you that *TPOS* was designed as a research tool for the tank platoon leader; synthesizing both *FM* and *ARTEP* and taking the mystery out of producing training objectives for subordinate leaders. My platoon leader experience, much like many others, was that a stubby pencil and unlined paper combined with hours of reading, note-taking, and cross-referencing could produce a decent Leader Book. Yet, all along, I wondered if there was a better way to cross reference the Company METL with the *ARTEP* Manual while at the same time tracking the platoon's training status.

The Out-of-the-Box Experience (OOBE) for this product is solid. Whether downloaded from the website or installed via 3.5" disks (I did both), this product downloads and installs in about half an hour. Questions can be answered via either tech support or the embedded interactive help menu.

When you enter the *TPOS* user-friendly menu screen, you can select from the following topics: Training Reports, Soldier Information, Gunnery Data, Serial Numbers, and Additional Reports (allowing the user to search for a specific piece of information).

Select "Training Reports," and you have instant access to a powerful crosswalk of tasks directly from *ARTEP 17-237-10-MTP* Chapter 2 and Appendix C. Here is how this is useful to the leader: Early in the fiscal quarter, the commander gives a platoon leader specific platoon collective tasks to focus on for the next three months. Push the "Platoon Collective Task Crosswalk" push-button, and the leader knows exactly what crew collective tasks apply to the commander's guidance. Next, by selecting the "Crew Collective Tasks Crosswalk," the leader is shown which specific individual tasks require proficiency. As a bonus, the user can select from buttons labeled for the Battlefield Operating Systems — by selecting "Command and Control," the *TPOS* illustrates every collective task that pertains.

As a superb data management tool, *TPOS* enables the leader to quickly identify weaknesses and plan and conduct training to improve proficiency.

"Gunnery Data" allows the leader to manage all important tank data used during maintenance and gunnery while "Serial Numbers" provides for the entry and management of all serial numbered items in a tank platoon.

Equally as useful as "Training Reports," is "Soldier Information." Entry fields cover everything from age to astrological sign and everything in between. When a soldier arrives, the leader prints the data screen and has the soldier fill in the blanks. The leader then enters the data into *TPOS*. Then, using a page of "Additional Reports," the leader can generate a query of any collection of the information with a single keystroke. A practical example of this feature and its utility comes from a notional lieutenant in Camp Casey equipped with *TPOS*. In preparation for the inevitable artillery strike that always precedes a Warsteed Exercise, the company commander wants a by-name list of every soldier's clothing sizes — from their T-shirts to their OGBs (before COB). This information will be sent to the S-4 to conduct resupply operations. The lieutenant with *TPOS* accesses the database and produces the report in three clicks of the mouse; the lieutenant without *TPOS* spends his day with pencil and paper chasing down 15 soldiers.

Currently, *TPOS* is used in the 2nd Squadron, 16th Cavalry Regiment to manage both soldier and student personal data and in the Armor Officer Basic Course to develop Maneuver Lesson Plans. In the near future, both a Scout Platoon and a Company Commander operating system will be available.

System requirements: 486 Microprocessor, Windows 95 or NT, 15 MB of available HD, VGA, and CD-ROM (3.5" is available).

Using the BowTech, Inc. Website, a *TPOS* demo is available for review prior to purchase at [www.militarytools.com](http://www.militarytools.com) or you can contact BowTech, Inc. at 614 Central Ave., Vine Grove, KY 40175.

CPT MATTHEW R. REDDELL  
Senior Team Chief,  
Armor Officer Basic Course  
Fort Knox, Ky.

## 1999 Armor Conference:

# “ARMOR: Spearhead to the Future”

It's that time of year again! The 1999 Armor Conference is rapidly approaching, and once again the U.S. Army Armor Center and Fort Knox will host one of the country's largest annual military symposiums. First held in 1946, the Armor Conference has greatly increased in popularity over the years, and it continues to serve as a valuable opportunity for leaders from all branches and components to come together to discuss current and future issues impacting our rapidly changing profession. This year's conference will be held Tuesday, May 18th through Thursday, May 20th and carries the theme, "ARMOR: Spearhead to the Future."

Armor as the spearheading force in adapting to change is the central tenet of this year's theme. In today's turbulent military environment of decreasing budgets and personnel, yet increasing operational tempo, the Armor Force remains the Spearhead for the Army. As stated in his Commander's Hatch editorial, Major General George Harmeyer, the Chief of Armor, views the challenge as nothing new for the Armor Force since we have led the military through its greatest transformation since World War II. As a result, he has extended invitations to some of the Army's most noted visionaries who will share their views on how the Armor Force can adapt to the challenges and changes that lie ahead. Conference attendees will find the numerous briefings and open discussions extremely informative and rewarding.

The annual Armor Trainer Update (ATU) will once again precede the conference on May 16th and 17th. This two-day event focuses on the challenges facing our Army Reserve and Army National Guard brothers-in-arms. As the number of military commitments around the world continues to rise, these units face even greater training challenges. The ATU provides a perfect forum to discuss these important issues. Last year, over 300 Army Reserve and National Guard members attended this event, and we hope that an even greater number will join us this year.

The G3/Directorate of Training, Plans, and Mobilization will hold the 7th annual External Unit Scheduling Conference at the Armor Inn, held in conjunction with the ATU, on May 17th. Units from the Active and Reserve Components, as well as from other branches of service, will vie for the opportunity to schedule Fort Knox's vast simulation facilities and range complexes. As training dollars dwindle, these cost-effective training facilities at Fort Knox become more and more attractive to units who wish to hone their combat skills. Consequently, the number of units taking advantage of this opportunity has greatly increased every year.

All work and no play would make any tankerman a dull boy! In order to energize and tee-off the 1999 Armor Conference, the 4th Annual Armor Golf Classic Scramble will provide some camaraderie, competition, and just some plain ol' fun. This year, PGA Touring Pro Mr. Robert

Gamez, will grace Fort Knox with a superb golf exhibition prior to the start of the Scramble. In addition, 72 local club pros will participate in a Pro-Am format, making the 1999 Armor Golf Classic Scramble the best to date.

One of the most popular aspects of the conference is the numerous contractor exhibits that are set up at Skidgel Hall during the entire week. Last year, over 150 displays demonstrating the latest breakthroughs in the defense industry, equipment prototypes, and state-of-the-art training devices were available for public viewing, and we expect an even greater number this year. For many, this is a once in a lifetime opportunity to see the absolute best our defense industry has to offer in one consolidated setting. Between the ATU and Armor Conference, we've even set aside one entire day for conference attendees to walk through the area and observe the latest innovations.

Once again this year, the General Frederick M. Franks Award will be presented to an individual who has demonstrated a lasting contribution to the ground warfighting capabilities of the U.S. Army. This year will mark the fifth time we've made the presentation of an award originally conceived by former Chief of Armor, Lieutenant General Larry Jordan. The nominees for this prestigious award must have demonstrated leadership characteristics possessed by the award's namesake, including one or more of the following: offered a vision for the future of the mounted warfighting force that significantly improved combat survivability, lethality, or mobility; developed an innovation in equipment, materiel, or doctrine that significantly enhanced the effectiveness of combat arms' mounted elements; exemplified professional excellence in demeanor, correspondence, and leadership; and displayed a love of soldiering. Last year's award recipient was COL Albert F. Turner, Jr., then Director of JOINT VENTURE, who was instrumental in the successful execution of the Army's Task Force XXI and Division XXI Advanced Warfighting Experiment and Division redesign.

The Armor Conference has attracted a much greater audience than just the armor and cavalry community. Attendance at this year's event is an absolute must for everyone concerned with the current and future states of our military, or those who are merely interested in enjoying a week of informative briefings, activities, and camaraderie. Despite continuing military cutbacks and decreases in funding, we face increasing mission demands every day. The only way we can survive these constant fluctuations is to demonstrate the resolve and demeanor that can inspire subordinates, peers, and superiors alike. The armor force proudly accepts the role as the spearheading force in adapting to the challenges and changes of the future. If you are willing to accept the challenges and changes that will inevitably affect everyone in the armor and army family alike, we'll see you at the conference!

# 1999 Armor Conference and Armor Trainer Update

(Tentative Agenda)

15 May – 20 May 1999

## “ARMOR: Spearhead to the Future”

<u>DATE</u>	<u>TIME</u>	<u>EVENT</u>	<u>HOST/SPEAKER</u>	<u>LOCATION</u>
<b>Saturday, 15 May</b>	1500-1900	Registration for ATU/Armor Conference	Protocol	Gaffey Hall, Bldg 2369
<b>Sunday, 16 May</b>	0700-0930 1900-2200	Registration for ATU/Armor Conference No Host Social for ATU	Protocol SACG-RC	Gaffey Hall, Bldg 2369 Leaders Club
<b>Monday, 17 May</b>	0700-UTC 0800-1700 0930-1700 1100-1400 1200-1700 0900-1700 1300-1700 1800-UTC	External Unit Scheduling Conference Armor Conference Early Registration USAARMC Sergeant Major Armor Update Honorary Colonels of the Regiment Contractor Displays Brigade and Regimental Commanders' Meeting Master Gunner Forum Pre-Golf Classic Social	G3/DPTM Protocol CSM Lady OCA DFD OCA Chief, Master Gunner Business Ops	Armor Inn Leaders Club Rivers Auditorium Patton Museum Skidgel Hall, Bldg 1724 HQ Conference Room Skidgel Hall, Clsm 1 Gallotta's
<b>Tuesday, 18 May</b>	0700-1600 0800-1700 0830-1400  1630-1830 1900-2130	Registration Contractor Displays 4th Annual Armor Golf Classic Scramble  CG's Garden Party Regimental Buffet and Assemblies	Protocol DFD  MG Harmeyer OCA	Leaders Club Skidgel Hall, Bldg 1724 Lindsey/Anderson Golf Courses Quarters One Leaders Club
<b>Wednesday, 19 May</b>	0730-1200 0800-1700 1100-1115 1115-1130 1130-1200 1200-1330 1830-1900 1900-UTC	Late Registration Contractor Displays Presentation of the 5th Annual Franks Award USAREC Award Presentations Armor Association Meeting Lunch/Visit Contractors' Displays Pre-Banquet Cocktails Armor Association Banquet	Protocol DFD  MG Harmeyer Armor Association DFD MG (Ret.) Tait	Gaffey Hall, Bldg 2369 Skidgel Hall, Bldg 1724 Haszard Auditorium Haszard Auditorium Haszard Auditorium Skidgel Hall, Bldg 1724 Leaders Club Leaders Club
<b>Thursday, 20 May</b>	0800-1200 1145-1330  1545-1600	Contractor Displays Chief of Armor Luncheon/ Patton Museum Groundbreaking Ceremony Closing Remarks	DFD MG (Ret.) Sheridan  MG Harmeyer	Skidgel Hall, Bldg 1724 Patton Museum  Haszard Auditorium

### Armor Conference Points of Contact

<b>Event</b>	<b>POC</b>	<b>DSN Number</b>	<b>Commercial</b>
Armor Conference	CPT Michael Long	464-4007	(502) 624-4007
Armor Conference	1LT(P) Daniel Eckert	464-1065	(502) 624-1065
Armor Trainer Update	LTC Randall Williams	464-1315	(502) 624-1315
CSM Update	SGM James Anderson	464-1321	(502) 624-1321
External Scheduling Conference	William Rosacker	464-3555	(502) 624-3555
Contractor Displays	SFC Kim Thompson	464-1250	(502) 624-1250
USAARMC Protocol	Jack Eubanks	464-6615	(502) 624-6615
USAARMC Protocol	Sherry Cart	464-6103	(502) 624-6103
Armor Association	Connie Bright	N/A	(502) 942-8624
Armor Magazine	MAJ Dave Daigle	464-2249	(502) 624-2249
VIP Billeting	Reservations	464-6180	(502) 624-6180
On-post Housing*	Carolyn Burton	464-3491	(502) 943-1000
Armor Classic Golf Scramble	Golf Manager	464-4218	(502) 624-4218

\*Reservations will be accepted up to 60 days prior to conference start date