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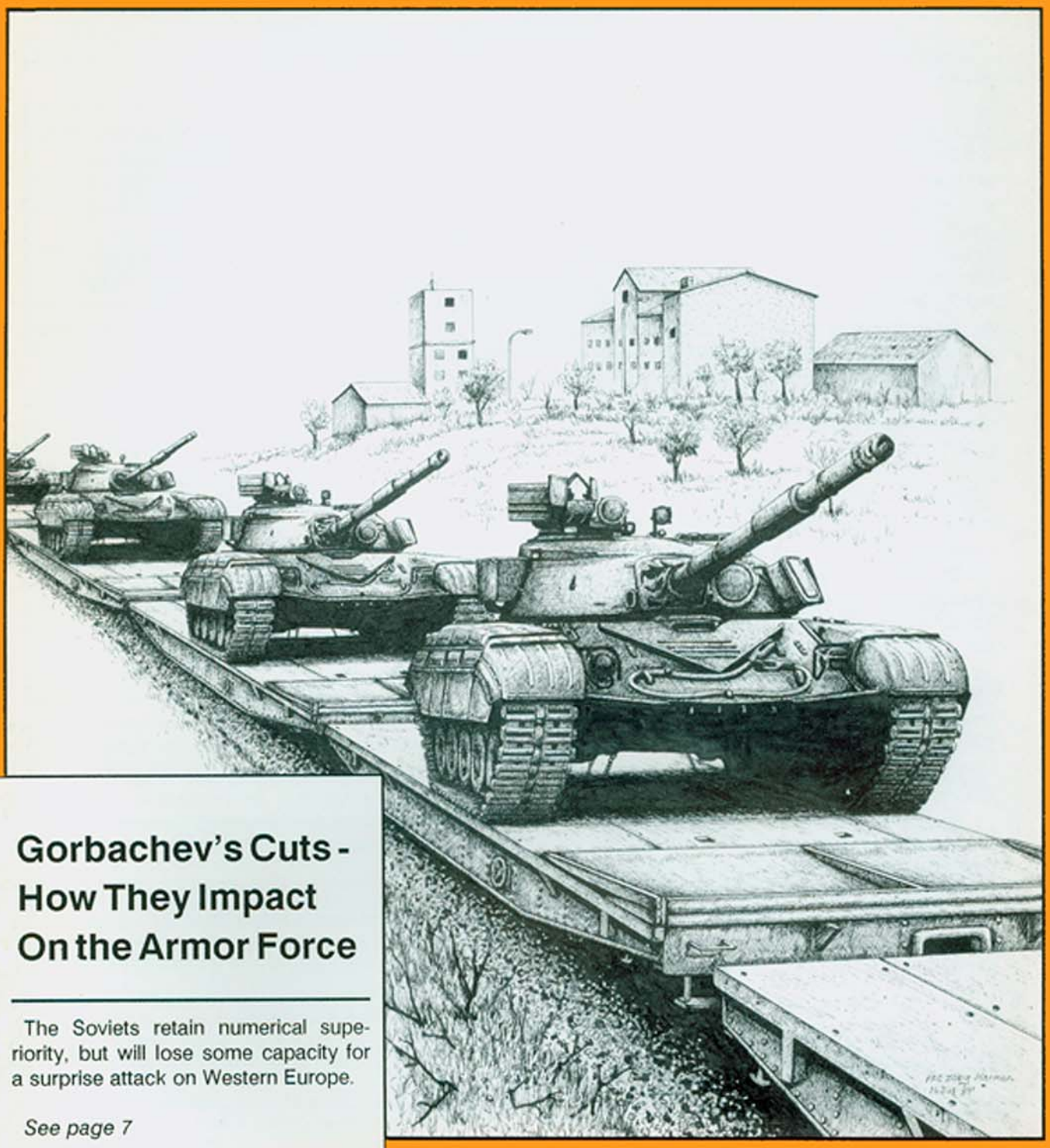

Gorbachev's Cuts - How They Impact On the Armor Force

The Soviets retain numerical superiority, but will lose some capacity for a surprise attack on Western Europe.

See page 7

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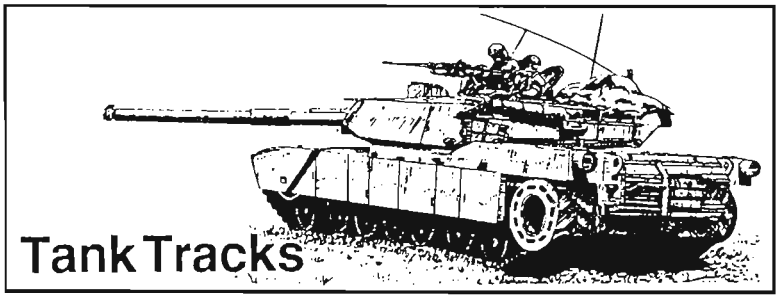
September-October 1989



I suppose that the heavy vs. light force debate will always be a natural by-product of constrained fiscal resources, but I have to wonder why those who choose to advocate dismemberment of heavy forces do so in a darkened room in the absence of the light of history. Sure, light forces are less expensively equipped than heavy, and I grant that light forces are more easily deployed to potential or actual hot spots. But don't both forces have sufficient missions to keep them busy – missions that each could do better than the other? Missions they must do together? Isn't our Army big enough for both?

Can BDU shirts and automatic weapons, no matter how well trained and physically fit their owners, take and hold ground against an armored foe? On the other hand, can a tank company alone seize a built-up area without getting its butt kicked? Despite arguments to the contrary, the answer to these questions is "no."

Light forces can handle many of the so-called low-intensity situations well. But each one has the potential to reach an intensity with which they can no longer cope. When that happens, who ya gonna call?

Combined arms is the key – we've known that for a long time. From its very inception nearly 50 years ago, combined arms has been the bedrock of the Armored Force, thus the significance of the three colors on the triangular patch: red (artillery), blue (infantry), yellow (cavalry).

Yet, there are always some who don't think we are needed, some who continually strive to put all our force development eggs in the light force basket. The September 1989 *Parameters* contains an article in which the author suggests that the heavy forces are a display army, while the light guys represent the real fighting army ("Two Armies," pp. 24-34). "One might well ask why America bothers with an expensive display army at all," the author writes. "Surely five or so light infantry divisions could just as easily hold the line in Europe, particularly if some of the money saved by mothballing the heavy force dinosaurs went into fielding of effective antitank weapons. This effort would seem a modest expenditure compared to the billions paid out for current heavy tanks and sophisticated fighting vehicles."

Let's see what the 101st Airborne troopers who were at Bastogne, and the British paratroopers who were in Arnhem think of this.

As Colonel Harry Summers wrote in his September 4, 1989, *Army Times* column (p. 23), "The average armored or mechanized division's 300 Abrams tanks, 300 Bradley infantry fighting vehicles, and the self-propelled 155-mm howitzers and multiple launch rocket systems of its division artillery provide an awesome array of combat power capable of standing toe-to-toe and slugging it out with any enemy force in the world."

That's what the Army's heavy force, and only the heavy force can do for you. Those who continually profess the attitude of "I'd rather be light than right" to the exclusion of all else need to wake up and smell the diesel.

– PJC

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Features

Departments

LETTERS

Light Scouts: Reinventing an Infantry Idea?

Dear Sir:

I would like to respond to an article in the March-April issue of your magazine, titled "New Scout Platoon Concept Will Test HMMWVs as Stealthy Scouts."

The HMMWV or light wheeled vehicle scout platoon is not a new concept at all. In fact, these scout platoons have been around for at least the last two decades. These scout platoons can be found in the light infantry battalions. It appears as if the Armor Center is trying to reinvent them.

Recently, the Cavalry has been fielding light cavalry troops for the light infantry divisions and brigades. Having transitioned to the new light cavalry troop, I feel that I am qualified to criticize the TO&E, organization and doctrine, and competent to offer a suggestion to improve the scout platoon organization.

First of all, the TOW is best left to anti-tank platoons. of which the light infantry brigade has nine. It is virtually useless on a scout vehicle. I'm sure the design was meant to parallel the M113/M901 mix, but the HMMWV TOW vehicle just does not compare with the ITV. The light units are supposed to be geared toward a low-intensity conflict anyway. If the other team used a lot of tanks, the conflict would be a high-intensity war. That TOW would be getting in the way when trying to deal with guerrillas in forests or other Third World terrain that is not as suited to armor warfare as say, Europe. Also, we spend more time training and maintaining the TOW than scouting. That is what 11Hs are for.

Next, the M2 .50 caliber machine gun. This weapon is great on an M113, but

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when you fire it on the M1025 HMMWV, all of the brass goes down into the troop compartment. The M60 machine gun would be an adequate weapon to use.

The doctrine of FC 17-101 and FC 17-101-1, the Light Scout Cavalry Troop how-to-operate manual, and ARTEP Mission Training Plan, is ambiguous and confusing, apparently designed to give commanders freedom to "task organize" with many different platoon configurations. The configurations are organized around the TOW HMMWV, and as I have already stated, it is not suited to a reconnaissance role. The proposals in the March-April article calling for the Stinger missile to be incorporated into a scout platoon also misses the mark. Like the TOW, it would take up training time from scouting to air defense. Leave that to the 16S people. If the task force or brigade commander thought it a good idea to send TOWs or Stingers forward with the scouts, he could attach them to the scout platoon as needed. That way you have experts in all fields carrying out the mission.

I suggest that the developers of light scout platoons adopt the organization and doctrine of the light infantry battalion scout platoon. The Infantry has years of experience here, and their doctrine is time, if not battle, tested. Perhaps it would be best if the light cavalry troop MTO&E was organized with four platoons configured exactly like the light infantry battalion scout platoon. After all, the light cavalry troops are used in the light infantry divisions and brigades. It would be easier for training and evaluation to get all scout platoons on the same sheet of music, and the infantry scouts are organized the best.

I also propose the creation of a new MOS for these light scout platoons. Cavalry scouts are trained at Fort Knox and are primarily Armor-oriented. When they come to a light cavalry troop, they require a lot of retraining. Infantry scouts are trained at Fort Benning to be infantrymen, and by chance, become scouts without any formal training as scouts. To alleviate these two problems, create the MOS 11D, Light Reconnaissance Scout. These scouts could be used in both the light infantry and the light cavalry.

JOHN A. JETT
SSG, OHARNG
Cincinnati, Ohio

Flaws Seen in Light Scout Concept

Dear Sir:

I am writing concerning the "New Scout Platoon Concept" article in your March-April issue. I am currently stationed at the NTC in the OPFOR S2 section. Prior to that, I was a crew member aboard a Scout "BRDM" (visually modified HMMWV).

I am gratified to hear than someone is aware of the need for "something better" for the scouts. The Bradley is an excellent fighting vehicle, but its height and noise level make it a poor choice for reconnaissance. However, I would like to point out some misconceptions about the idea of the new "Stealthy Scout" concept. The idea of the HMMWV as a recon vehicle has been tried before at Fort Lewis, as part of the motorized concept as a whole. The problems that were never alleviated, and were shown most convincingly when the 9th ID came to be "trained" against the OPFOR at the NTC, were the need for survivability and firepower. A HMMWV-pure scout platoon relies mainly on its TOW and MK 19 vehicles for overwatch. The TOW, though a good defensive weapon, was never designed to give suppressive fire when contact is established. The MK 19 grenade machine gun may be the answer to the suppression issue: odds are, however, it will not eliminate the threat. Against a BMP or even a BRDM, the HMMWV stands little chance of even outrunning contact without some form of immediate and accurate suppressive fire.

A mixed platoon of HMMWVs and Bradleys has greater firepower, but at the same time defeats its purpose of being "stealthy." What good is it to have excellent overwatch when everyone knows you're there? Unless you can move extremely fast over unfamiliar terrain, you can expect an artillery barrage to fall on your position shortly.

Lastly, a word about the use of the HMMWV as a recon vehicle at the NTC. These vehicles are visually modified to look like Soviet BRDM-2s, armored reconnaissance vehicles. Under the MILES system, they carry lasers on the vehicle to replicate 14.5-mm and 7.62-mm machine gun fire; they carry a MILES Dragon to replicate the RPG-16. They also carry the same sensor belts as armored personnel carriers. Their survivability is admirable, and by using the Dragon/RPG, they can challenge or neutralize armored threats. The important point here is that this is not a HMMWV doing the mission: rather, it is an armored recon vehicle.

In conclusion, while I agree with the premise of a vehicle that is smaller, quieter, and faster, the concept of survivability should not be overlooked. A dead scout is no good to anyone, and even the best scout will encounter enemy contact at some time.

I am in the midst of preparing for the upcoming rotation in which the new configurations will have their debut. There is no more consternation than a normal "modern rotation" (Bradleys and Abrams) causes. Whether the new configurations work out or not is anyone's guess, but I would like to wish the scouts of the 24th ID "good luck."

RICHARD G. JOHNSTON
SGT, HHC, 1-52 In Bn
Ft. Irwin, Calif.

Zumbro Is Right About Armor's "Achilles Heel"

Dear Sir:

Your May-June issue was bursting with timely, well-articulated and thought-provoking articles. However, Ralph Zumbro's, "Armor's Achilles Heel," and MG Tait's, "Leadership — Often Studied But Seldom Understood," were, in my view, the best. Both articles are must reading for all soldiers in leadership positions — at any level — as well as those aspiring to be.

Zumbro's clear insight on the "care and feeding" of Armor units deployed across extended distances is applicable to all levels of conflict, and applies equally to all members of the combined arms team. Hopefully, it will provoke some rethinking and reassessment of the mobility that is required in our combat service support capabilities at brigade, battalion, and company. Unfortunately, counter to past lessons learned, we have seen a slow erosion over the past ten years in our ability to provide on-position replenishment of fuel, ammunition, and spare parts.

The thinking seems to be that it is better to have the "consumer" come to the "store," than to bring the "store" to the "consumer." As Ralph Zumbro points out, it doesn't work that way in the real world of combat!

MG Tait made a similar comment when he stated that the Army cannot be run like a major corporation. Yet, there are some who think it can, and as the general points out, those who try, do indeed "run unhappy ships," and, I might add, very inefficient and largely ineffective ships over the long term. Could it be that we forgot to talk to the soldiers when we began to restructure our TO&Es and reduce our mobility and robustness in our combat ser-

Continued on Page 43

COMMANDER'S HATCH

MG Thomas C. Foley

Commanding General

U.S. Army Armor Center

It is a very high honor to return to Fort Knox to become the Commander of the Armor Center, Commandant of the Armor School, and Chief of Armor and Cavalry. I look forward to this opportunity to serve.

These are great times for Armor and Cavalry. One has to be excited about the future. After all, ours is the branch that has the legacy of a brilliant band of professionals who have inspired us with their leadership. They were visionary leaders, with courage, candor, and commitment, who forged the thunderbolt, fought it to victory on the battlefields of World War II, and have continued to lead the way in shaping it into today's combined arms team. But we must not rest on their laurels. We must move ahead in the face of today's great challenges – a shrinking budget and the growing perception that the threat has diminished. As the leading proponent for mobile armor warfare, we must move out on multiple axes:

- We must develop sound doctrine, tactics, techniques, and procedures as the foundation of everything else we do.

- We must train proud, disciplined, confident, and competent soldiers ready to fight and win. We must assist Armor and Cavalry units in achieving a high level of training readiness.

- We must develop commissioned and noncommissioned Armor and Cavalry leaders who are tactically and technically competent, bold and aggressive, ready to take risks and seize the initiative; leaders who will care for their soldiers and lead their units to battlefield success. We must also develop our leaders so they are ready to assume ever higher levels of responsibility.

- We must ensure our organizations are designed against the standard of battlefield operational effectiveness, and not efficiency.

- We must develop armored weapons systems which capitalize on the ingenuity and skill of American soldiers and leaders, the dictates of our operational concepts, and our technology.

Whether Active Army or Reserve Component members of Armor and Cavalry, we must work closely with the other members of the U.S. Army team, our sister services, and our allies. We must make the combined arms concept a reality.

In future columns, our intent is to take a longer view of trends, developments, and outlooks, which may help indicate where we should be headed. The hope is that some of this will cause our readers to respond. The resulting dialogue will benefit our branch. To this end, all commanders of tank battalions and cavalry squadrons, at that level and above, will soon receive letters from the Chief of Armor and Cavalry soliciting their advice concerning matters of importance to our branch. The purpose of all this is to establish a meaningful dialogue with the field, so that we are responsive not only to your immediate requirements, but can get your views and help in shaping our future.

As part of our dialogue, we will also highlight and reflect on some important anniversaries. This will include the 50th birthday of the Armored Force next July, as well as the golden anniversary of the sixteen armored divisions and the separate tank and tank destroyer battalions that fought in World War II.

I am fully confident that, working together – reflecting on the great lessons from those who have gone before, and realistically assessing the challenges of today and tomorrow – we too will have the courage, the candor, and the commitment to do what is needed.

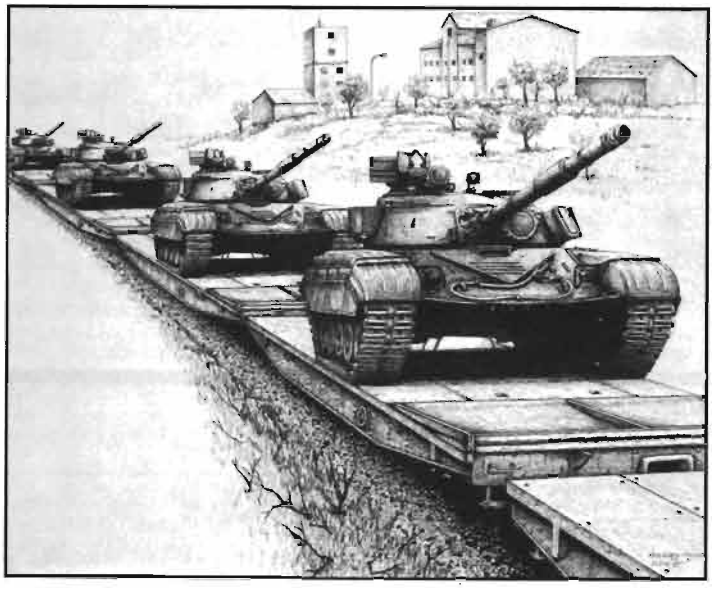
Forge the Thunderbolt!

Gorbachev's Cuts - How They Impact On the Armor Force

Tanks will become tractors. Troops will train for the defensive. Six tank divisions are going home.

The Soviets will retain numerical superiority, but will lose much of their potential for a surprise attack.

by Gerald A. Halbert



Normally, most tankers cannot get too excited about international politics. This is both good and bad. Tankers get paid to fight, not to be diplomats. Yet, in the U.S. Army, while we do not want to go to war, our job is to keep the price of going to war so high that any enemy wants to think twice about fighting.

Recently, the President of the USSR, Mikhail S. Gorbachev, has changed the Soviet Army in such a way that, if a war should come, the Soviet Army will not appear to be what it was several years ago. Our tankers ought to know about these changes.

On 7 December 1988, Gorbachev announced at a meeting of the United Nations in New York that the Soviet Union was going to unilaterally reduce the Soviet Armed Forces by 500,000 men, 10,000 tanks, 8,500 artillery systems, 800 aircraft, and other combat equipment. Six tank divisions are supposed to be withdrawn from central Europe and disbanded. In addition, assault-landing and assault-crossing units will be withdrawn. Divisions remaining in Eastern Europe are to be reorganized to be more "defensive." The 10,000 tanks withdrawn from units will be destroyed or converted for civilian use.[1] (While the mind boggles at the civilian use of tank chassis, this idea is not as far fetched as it seems. The USSR has large areas of woodland and flatland where heavy tractors would be useful.)

Other spokesmen later amended Gorbachev's statement. General Boris Snetkov, Commander in Chief (CINC) of the Group of Soviet Forces Germany, later said, "In the future all the tanks will be sent beyond the Urals. Some of them will be mothballed, and others will be used in the national economy after modifications."[2]

The cut is not limited to men and equipment, but includes a reduction of 14.2 percent in the direct operating costs of the Soviet military, and a 19.5 percent reduction in the budget for production of arms and military equipment.[3] Soviet tank production for the years 1983-1987 averaged about 3,500 per year.[4] A reduction of 20 percent would reduce production about 700 tanks annually to 2,800 tanks per year. *Jane's Defence Weekly* estimates that the Soviets operate about 53,000 MBTs, of which 30,000 are older models, such as the T-54/55 or T-62.[5]

Perhaps the most significant information about the troop reduction and tank withdrawal came from an interview with the Soviet defense minister, Army General D. T. Yazov, in an *Isvestiya* interview published in the 28 February 1989 issue. Yazov provided more detailed information about the reduction than Gorbachev did in the initial announcement. The groups of forces in Eastern Europe will lose 5,300 tanks. The six withdrawn tank divisions will disband. Air assault and (presumably) engineer pontoon regiments will be removed. The pontoon bridge units

Table I. Soviet Forces in Eastern Europe Before Withdrawal[11]

Group Of Forces	MRD	TD	ITR	ITB	Total Number Of Tank Battalions
GSFG	8	11	5	8	181
CGF	3	2		3	41
SGF	2	2	1	2	37
NGF	1	1	1	1	20
Totals	**14**	**16**	**7**	**14**	**279**

MRD – Motorized Rifle Division

TD – Tank Division

ITR – Independent Tank Regiment

ITB – Independent Tank Battalion, normally one organic to each MRD in Eastern Europe.

NOTE: Of necessity, all Soviet and Warsaw Pact strength figures are approximate. They represent the best compilation of data available.

will reduce the Soviet's ability to cross water obstacles while on the offensive.[6] In addition, individual tank regiments in the groups of forces will be converted into motorized rifle regiments.[7]

Remaining units will be reorganized to look more defensive. The motorized rifle divisions in GSFG and CGF will lose their organic tank regiment. Each MRD will lose about 40 percent of its tanks. Each tank division in the groups of forces will also lose a tank regiment, or about 20 percent of its tanks. A motorized rifle regiment will apparently replace each tank regiment.

The reorganized divisions will also have more antitank and antiaircraft assets. Additional minelaying and engineer obstacle assets will be added to the units, in addition to increased engineer camouflage equipment.[8]

The unit and equipment withdrawals will be in two stages. The first withdrawals were due to start in April 1989,[9] and in fact the first reported withdrawal began on 25 April 1989 when 31 T-64 tanks were reported shipped to the USSR from Kiskunhalas, Hungary.[10]

Of most interest to USAREUR-oriented tankers are the Soviet reductions in the Group of Soviet Forces in Germany (GSFG). In 1989, the 25th Tank Division (20th Guards Army [GA]), 32nd Guard Tank Division (20th GA), two independent tank training regiments, and eight independent battalions will withdraw.[12] The eight independent battalions are presumably the independent tank battalions found in motorized rifle divisions. In 1990, the 7th (3d Shock Army [SA]) and 12th Guards Tank Divisions (3d SA), an independent tank training regiment, an air-assault brigade, three unspecified training regiments, and several more independent battalions will withdraw.[13]

If we count just the combat elements, this withdrawal almost amounts to the removal of a tank army from the GSFG. It does not equate to the removal of the tank army because a tank army has many other units, such as artillery, air defense and other support units, that remain. Nonetheless, it would not be unreasonable to expect that within the next two to four years that the Soviets might remove an army headquarters from GSFG. Interestingly enough, the Third Shock Army and 20th Guards Army are in the central GDR, and normally considered to be committed against NATO's Northern Army Group, rather than against the Central Army Group, composed of the majority of USAREUR and many FRG Army units.[14] Because both of these armies will lose about half their combat power, either army could be deactivated.

Many Soviet units opposite USAREUR are in the Central Group of Forces (CGF) in Czecho-

Table II. Warsaw Pact Forces in Eastern Europe

Type Of Equipment	Soviet	Other Warsaw Pact	Warsaw Pact Total
Tanks	41,580	17,890	59,470
ATGM Launchers	8,840	2,625	11,465
BMP/BTR	45,000	25,330	70,330

Table III. Soviet Old Divisional Strength[20]

Type Division	Number of Tanks	BMPS/BTR	SP HOW	MRL	Tank Regiments
MRD	270	680	197	18	1
TD	330	255	165	18	3

Table IV. Soviet New Divisional Strength*

Type Division	Number of Tanks	BMPS/BTR	SP HOW	MRL	Tank Regiments
MRD	166	640	197	18	0
TD	277	215	165	18	2

*Calculated by removing independent tank battalion and converting a tank regiment from MRD and tank regiment from TD to a motorized rifle regiment with a 40-tank battalion.

slovakia. CGF will lose two independent battalions in 1989, and in 1990 will lose the 31st Tank Division, an air-assault battalion and an engineer regiment.[15]

Although forces in the Southern Group of Forces (SGF) in Hungary do not directly face USAREUR units, SGF will lose the 13th Tank Division in 1989, along with an independent tank training regiment and air assault battalion.[16] Units from SGF could deploy against Western Europe instead of being committed against the Balkans. The Northern Group of Forces (NGF) in Poland could commit forces against USAREUR units deployed in the north of the Federal Republic of Germany. NGF will lose a tank regiment in 1989, along with an air-defense regiment and independent helicopter regiment.[17]

Anyway you look at it, these are significant reductions in force that could potentially be committed against USAREUR.

How does the reduction compare to the total number of systems held by the Warsaw Pact in Europe? The Soviets are notorious for not releasing any data on the actual strength of their own armed forces, unless attributing it to foreign sources, in effect saying, we won't tell you how big our army is, but the West says it is so big. Under Gorbachev, this has begun to change. In January 1989, the Warsaw Pact Defense Ministers Committee released a document comparing the strengths of the Warsaw Pact and NATO, using admitted Warsaw Pact data for the first time.[18] A portion of the information is listed in Table II.

These changes will significantly affect the force structure. Each Soviet division exchange of a tank regiment for a motorized rifle regiment will reduce the strength of the divisions significantly. Soviet tank and motorized rifle divisions were organized with a mirror image. Each tank division had three tank regiments, a motorized rifle regiment, and an artillery regiment, plus supporting units. Each motorized rifle regiment had three motorized rifle regiments, a tank regiment, and an artillery regiment. Under the new concept, each motorized rifle division will have four motorized rifle regiments, and the tank division will have two tank and two motorized rifle regiments. Table III lists the strengths of old Soviet units, while Table IV estimates the strength of the new units.[19]

The Soviet forces left in Eastern Europe after the withdrawal will remain a considerable force, but with limited capabilities. Table V shows the overall strength of Soviet forces in Eastern Europe after the withdrawals are completed. The 146 tank battalions left represent 52 percent of the original strength.

Table V. Soviet Forces in Eastern Europe after Withdrawal[21]

Group Of Forces	MRD	TD	ITR	ITB	Total Number Of Tank Battalions
GSFG	8	7	2	0	90
CGF	3	1		0	20
SGF	2	1	0	0	24
NGF	1	1	0	0	12
Totals	**14**	**10**	**2**	**0**	**146**

These changes are not limited to units of the Soviet Army in Eastern Europe. Other Warsaw Pact forces will be cut back, as will Soviet forces in other areas.

Bulgaria will reduce it's forces by 10,000 soldiers, 200 tanks, and 200 artillery systems.[22]

Czechoslovakia plans to reduce active duty personnel by 12,000. The

Table VI. Soviet Forces In Western USSR*

Military District	MRD	TD	Airborne Divisions	Total
Baltic	6	3	1	10
Byelorussian	3	7	1	11
Carpathian	7	3	0	10
Kiev	4	6	0	10
Moscow	4	2	1	7
Totals	**24**	**21**	**3**	**48**

*There are other military districts, but their forces are probably committed to other areas. The Kiev MD will probably back up the Odessa MD, but could reinforce Soviet forces in Germany and Czechoslovakia.

number of tank regiments will be reduced, and three combined-arms (mechanized infantry) divisions will be reorganized and reduced to a cadre status. Eight hundred fifty tanks and 165 armored transporters will be gradually eliminated. The military budget would be cut by 15 percent by 1991.[23] Czechoslovakia has been credited with having five tank and five motorized rifle divisions.[24] This will leave Czechoslovakia with five tank divisions, two active MR divisions, and three cadre MR divisions.

The army of the German Democratic Republic (East Germany) will be reduced by 10,000 men, six tank regiments, and 600 tanks. For the East Germans, this represents a fairly large force cut.[25] The GDR is generally credited with having two tank divisions and four MR divisions.[26] This reduction amounts to a removal of one tank regiment per division. (It is not clear that this is how the cuts will be apportioned.)

Hungary announced that the budget would be cut 10-17 percent.[27] Hungary will reduce its personnel strength by 9,300, tanks by 251, and eliminate 30 BTRs. It will also remove 180 antitank weapons from the force structure.[28]

Poland has been in the process of reducing the size of the military for the last two years. Fifteen thousand soldiers were to be removed from active duty, but specific numbers of tanks removed have not been released, nor the number of units deactivated.[29]

The Soviets informed the Norwegian government that Soviet forces near Norway would be cut by about 20,000 men. The 20,000 soldiers would come from the Leningrad Military District and the Murmansk bases on the Kola Peninsula.[30]

Three-fourths of the Soviet troops in Mongolia will be withdrawn. More than 260,000 soldiers in the eastern and southern USSR will be discharged.[31] In Mongolia, two tank divisions and a motorized rifle division will be withdrawn.[32] That should leave one motorized rifle division in Mongolia.[33]

In addition, several motorized infantry divisions in the USSR will be converted into relatively static machine gun/artillery divisions, which have a defensive nature.[34]

According to the Warsaw Pact, a minimum of 11,901 tanks will be removed from the force structure in Eastern Europe in the next two years.[35] If completed, this reduction will reduce the Soviet capability to mount an offensive operation without reinforcements.

There will remain large numbers of units in the USSR, available for mobilization and reinforcement of the Warsaw Pact. As Table VI indicates, there are 48 divisions available to reinforce GSFG and CGF.[36] Many of these units are kept at a lower state of readiness than those in Eastern Europe.

The Soviets recognize that it will be a challenge to reconfigure their divisions and revamp their tactics. Army General B. Snetkov, the commander in chief of the Group of Soviet Forces in Germany, said in a *Red Star* interview of 23 March 1989,

"I have already said that we cannot forgo combat capability. But the transition of the divisions remaining in GDR territory to a defensive structure — and in this respect the number of tanks will be considerably reduced — and the withdrawal of tactical nuclear systems from the group of forces, together with assault landing and assault river-crossing subunits and their arms and equipment, will of course require the revision of some views on combat training. The reduction in the forces' offensive potential presupposes increased attention to their training from the point of view of defense.

"This task will primarily be solved by ensuring the qualitative parameters of combat readiness. In particular, with regard to arms, this will be apparent in the increased number of antitank systems and artillery in the remaining divisions. With regard to tactics, greater importance will be attached than before to the engineer equipment of positions and defense regions. As a whole, the emphasis in troop training will be on the perfection of issues connected with troop defense operations."[37]

Cuts in Warsaw Pact forces may include bridging units, essential for a surprise attack into Western Europe.

General Snetkov went on to add that the planned deactivation of the units will affect some of the most honored Soviet units. One regiment, the M. Ye Katukov, the Chertkovskiy Marshal of Tank Troops, Twice Order of Lenin, Order of the Red Banner, Suvorov, Kutuzov, and Bogdan Khmelnitskiy Guards Tank Regiment, the senior guards tank regiment in the Soviet Army, is assigned to one of the motorized rifle units scheduled for deactivation. General Snetkov recommends that it be transferred to a tank division to preserve the combat traditions of the unit.[38] This could pose a problem for those monitoring deactivation of the units if many units are exchanged for other units.

The impact on the NATO tanker is that the Soviets will have fewer tanks, but more infantry, artillery and ATGMs. This should result in a reduced capability to mount offensive operations. It should significantly enhance their defensive capability. In fact, if carried out, it meets many of the objections the West has had about the Soviets' capability to mount offensive operations.

While this capability is reduced, it is not totally removed, and Soviet forces should be quite capable of mounting counter-offensives. After reinforcement, they could, of course, mount a major attack. An issue that may come up in future arms reduction talks is the very utility of the tank and other weapons for both offensive and defensive combat. The Soviets clearly realize that while some type of weapons systems, such as aircraft, are for attack, others are defensive, yet others can be used for either. They do consider the tank to be a "universal weapon," suitable for use both in attack and in defense.[39] Because the tank is universally recognized as a tracked vehicle mounting a turret with a main gun large enough to kill opposing tanks, it is possible that the Soviets might develop a modern assault gun. Assault guns, by their very nature are not as "offensive" as normal tanks.

Such a vehicle might be very hard to kill. A new assault gun combining missile and gun would represent a qualitative increase in effectiveness over existing systems.

Even after the announced large cuts in Soviet forces, they will still have a effective numerical superiority in Eastern Europe for some time to come. Those seeking to offset the Soviet numerical superiority should ponder a statement by Marshal of the Soviet Union Akhromeyev, the former chief of the general staff and now apparently a special military advisor to President Gorbachev.

"At the same time, as the structure of the Soviet Armed Forces is now being given a defensive thrust, new methods are being introduced to maintain military capacity at a level which guarantees the country's

security in the event of possible reductions in both nuclear and conventional arms. Under such circumstances, it is of crucial importance that the arms and the equipment supplied to the Army and the Navy be effective and of high quality, so that the defense objectives can be met with a smaller number of weapons."[40]

Although significant Soviet forces will be left in being, these cuts when implemented, will lead to a signficiant reduction in the Soviet ability to wage a ground war without extensive mobilization.

Notes

[1]"Deputy Defense Minister Comments on Tank Cuts," article, p. 4 in the Bulgarian paper Harodna Armiya, 25 January 1989, quoting Army General Vitaliy Shabanov, USSR Deputy Defense Minister for Armaments, as reprinted in FBIS-SOV-89-017, 27 January 1989, p. 1. See also the editorial on p. 15, Aviation Week and Space Technology, December 12, 1988. This editorial is an extract from the December 7, 1988, address to the UN by Mikhail Gorbachev.

[2]Interview with GEN Snetkov, Moscow TASS International Service in Russian 0940 GMT, 17 April 1989, as reprinted in FBIS-SOV-89-074, 19 April 1989.

[3]Interview with LTG G. A. Stefanovskiy, Deputy Chief of the Main Policial Administration of the Army and Navy by Yu. Bychkov, "Today We Are Not On Parade," p. 1-2, Sovietskaya Kultura, 23 February 1989, as reprinted on p. 99, FBIS-SOV-89-045, 9 March 1989.

[4]Soviet Military Power 1988, p. 38, US Government Printing Office, Washington, D.C., 1988.

[5]"Arms Cut Details Revealed," Jane's Defence Weekly, 28 February 1989, p. 279.

[6]Interview with Army General D. T. Yazov, p. 3, Izvestiya, 28 February 1989, as reprinted on pp. 1-4, FBIS-SOV-89-038, 28 February 1989.

[7]Izvestiya article on p. 3, 27 Feburary 1989, interview with General of the Army D. T. Yazov, as reprinted on p. 18, The Current Digest of the Soviet Press, Volume XLI. No. 9 (1989).

[8]Interview with Army General D. T. Yazov, p. 3, Izvestiya, 28 February 1989, as reprinted on pp. 1-4, FBIS-SOV-89-038, 28 February 1989. See also interview on Moscow TASS International Service in Russian 0940 GMT 17 April 1989 with General B. Snetkov, CINC, GSFG, as reprinted in FBIS-SOV-89-074.

[9]Radio interview with Army General V. Shabanov in Hungarian, NEPSZABADSA, Budapest, 18 January 1989, as reprinted on p. 1, FBIS-SOV-89-013, 23 January 1989. See also Moscow TASS International Service in Russian report, 0955 GMT, 24 April 1989, as reprinted in FBIS-SOV-89-078, 29 April 1989.

[10]Photograph in The Washington Post, April 26, 1989, p. A23.

[11]The Military Balance, 1988-1989, International Institute for Strategic Studies, London, 1989, pp. 30-40.

[12]"Tank Unit Withdrawals Revealed," Jane's Defence Weekly, 18 March 1989, p. 472.

[13]Ibid. Army subordinations from p. 47, Mark L. Urban, Soviet Land Power, Hippocrene Books. New York, 1985.

[14]Urban, p. 106.

[15]"Tank Unit Withdrawals," p. 472.

[16]Ibid.

[17]Ibid.

[18]"Statement of the Warsaw Pact Defense Ministers Committee "On the Correlation of Warsaw Pact and North Atlantic Alliance Force Strengths and Armaments in Europe and Adjoining Waters," as printed in MOSCOW Pravda, 30 January 1989, First Edition, p. 5, as reprinted in FBIS-SOV-89-018.

[19]David C. Isby, Weapons and Tactics of the Soviet Army, Jane's. London, 1981, pp. 79-81, 109-112.

[20]Soviet Military Power: An Assessment of the Threat 1988, Government Printing Office, Washington, D.C., 1988, p. 74.

[21]The Military Balance, 1988-1989, International Institute for Strategic Studies, London, 1989, pp. 30-40.

[22]Moscow Television Service Program in Russian 1135 GMT, 18 February 1989, "In the Countries of Socialism," as reprinted in FBIS-SOV-89-033, 21 February 1989.

[23]Interview with Milan Vaclavik, CSSR Ministry of National Defense by S. Vtorushin, p. 4, Moscow Pravda, Second Edition, 9 March 1989, as reprinted in FBIS-SOV-89-046.

[24]Urban, p. 118.

[25]TASS Agency News Release "GDR's Honecker Announces Unilateral Troop Cut," Moscow TASS in English 0629 GMT, 24 January 1989, as reprinted in FBIS-SOV-89-016, 26 January 1989.

[26]Urban, p. 117.

[27]"E. Europe Responds to Gorbachev Cutbacks," Jane's Defence Weekly, 7 January 1989, p. 22.

[28]Argumenty I Fakty, No. 6, 11-17 February 1989, p. 8, as reprinted in FBIS-SOV-89-034.

[29]Moscow Television Service, 18 February 1989.

[30]"Troops Near Scandinavia To Be Cut by 20,000," Stockholm Domestic Service in Swedish 1545 GMT 10 March 1989, as reprinted on p. 2, FBIS-SOV-89-048, 14 March 1989.

[31]Yazov interview (see note 6).

[32]TASS news release, Moscow TASS International Service in Russian, 1705 GMT, 15 March 1989, as reprinted in FBIS-SOV-89-050, 16 March 1989.

[33]Urban, p. 35.

[34]Yazov interview.

[35]FBIS-SOV-89-034, p. 8.

[36]Division strengths extracted from Urban, pp. 48-53.

[37]"Interview with Army General B. Snetkov, Commander In Chief of the Group of Soviet Forces in Germany by Colonel A. Vasilete, Krasnaya Zvezda, 23 March 1989, p. 2, First Edition, as reprinted on p. 81, FBIS-SOV-89-056.

[38]FBIS-SOV-89-056, p. 83.

[39]"International Situation-Questions and Answers," Moscow Domestic Service in Russian, 1445 GMT 3 March 1989, as reprinted in FBIS-SOV-89-044. 8 March 1989.

[40]MSU Sergey Akhromeyev, "The Soviet Union is Not Lowering Its Guard," Stockholm Svenska Dagbladet, p. 3, in Swedish, 30 November 1988, as reprinted on page 119, FBIS-SOV-88-234, 6 December 1988.

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Developing a Tank Autoloader

by Major John C. Woznick

Above, the TACOM Tank Test Bed vehicle has an automatically-loaded overhead gun system.

The large-caliber, direct-fire, tank cannon has developed to the point where the introduction of an ammunition loading system or autoloader is becoming an essential requirement. Increases in cannon caliber and chamber volume have led to an increase in the size and weight of tank main gun rounds. The current generation of 120-mm tank rounds for the M256 cannon is approaching the limit of the capabilities of an armor crewman to load efficiently and safely. Additionally, the use of combustible-cased ammunition has resulted in an increase in the fragility of the ammunition, which makes proper handling an even more critical requirement.

The introduction of the autoloader can offer positive impacts on system design. A well integrated autoloader can minimize turret volume and armor requirements. The automatic loading of ammunition reduces workload on the tank and offers the possibility to reduce crew size. New technologies in robotics, automation, electric motors, and sophisticated microprocessor control systems appear to be applicable to the problem of automatic ammunition handling.

In recent years, several countries have adopted autoloaders, most notably the Soviet Union. The Soviets' autoloader, with an ammunition magazine below the turret, allows them to reduce the height of their tanks while maintaining maximum armor protection. They decided to reduce their crew size, saving personnel and resources. The autoloader handles a 125-mm two-piece round, which allows them to pack more propellant into a large chamber to achieve high projectile velocities. The Soviet autoloaders, therefore, represent an integrated armament system that offers advantages in survivability and lethality.

Several of our allies have introduced or will introduce autoloaders in their next generation of tanks. The French LeClerc tank includes a bustle-mounted autoloader capable of loading the current generation of 120-mm tank ammunition. Autoloader development programs are

also underway in West Germany, the United Kingdom and Japan. In the United States, the Tank Test Bed (TTB) and Manned Weapon Station (MWS) programs both included autoloaders as part of the system design, and private industry has produced several autoloaders as Independent Research and Development (IR&D) projects.

The autoloader can offer advantages in lethality, survivability and sustainability, but only if the design supports the combat system. There are also penalties and compromises that must be considered if we are to field an autoloader.. Among other concerns, we must address safety, reduction of the crew and subsequent increase in the workload, and cost of the system. Although autoloaders look ever more attractive and producible, only a well thought out design can offer the benefits and avoid the penalties associated with fielding a new system.

Numerous issues are considered in developing the optimum autoloading strategy to best support the mission requirements of the combat system. We must explore them if the resulting system is to meet the goals set for the armament system and the combat vehicle. The development of a successful system will require decisions on correct trade-offs that can only be made when the issues impacting on the development of the autoloader are understood. What then are the challenges in developing an autoloader for the future tank?

Integration

The autoloader is an integral part of a larger system. First, it is a functional part of an armament system, which includes ammunition, gun, fire control, and crew. Second, the autoloader is a component in a combat system that must be optimized for lethality, mobility, survivability, and sustainability.

Design of a system to accomplish required autoloader functions can not be done in isolation. Each design decision must be considered in light of its impacts on both the functional and combat systems. This process is complicated by the autoloader which is a new element of the large-caliber direct-fire system and not a part of an established design. Systems integration issues will include the ammunition, gun, fire control, and power supply interfaces. Additionally we must consider vehicle space, survivability concerns, human engineering, and NBC protection requirements. The introduction of the autoloader can affect some integration issues; however, many will result in design trade-offs to maximize the efficiency of the overall systems.

Lethality

The first requirement in designing an autoloader system is to enhance the lethality of the weapon system. In the case of the autoloader, several concerns are paramount. You must first define the bullet. Recent ammunition lethality improvements include larger calibers, combustible cases, and innovative warhead and penetrator designs. A future possibility is using separated ammunition to increase the chamber volume of propellant to launch heavier payloads or attain greater muzzle velocities. The primary design goal of the autoloader is to provide safe and efficient handling of these more lethal rounds of ammunition.

Next, the autoloader must support a high rate of fire. The rate of fire is a function of the efficiency of the design, and integration with the ammunition, gun and fire control. The current rate of fire with current 120-mm ammunition is one round every seven seconds, or 8-9 rounds per minute. The autoloader should perform at least as well. However, a requirement for a higher rate of fire than necessary will force design decisions that will adversely impact the overall system design. For example, a requirement to load at 15 rounds per minute for a sustained period may require a large magazine immediately behind the gun. This may result in a higher silhouette and the need for increased turret armor, with its associated weight penalty. The engineer must strike a balance between a higher rate of fire and the related design costs. The exact rate of loading and firing will be established by the threat defeat criteria determined by the user's analysis.

Another lethality design goal may be to maximize the number of onboard rounds. As ammunition size increases, the number of rounds might be reduced as space is exhausted. This could occur if increasing the chamber volume of propellant (to throw a bigger and/or faster projectile) is required to defeat the threat. Using the Abrams as a baseline, fewer than 40 rounds stowed on the vehicle implies reduced system lethality.

The counter-argument is that, if a more lethal round is required to defeat the threat target, the loss of basic load to assure a kill is acceptable. This is a trade-off that will be made by the user. It must also be addressed by the systems integrator because the ammunition must compete for space with other elements of the system. The autoloader design must support the stowage of the maximum number of rounds. This forces the autoloader developer to locate the loading mechanisms so they will not interfere with ammunition stowage, and

Autoloading turret of the Tank Test Bed Vehicle is suspended in a vibration testing fixture. Rounds stored vertically in the turret basket can be seen below the gun.

develop a storage strategy that makes most use of available space.

Given the space and configuration constraints of the combat vehicle, not all rounds may be immediately available for loading. Replenishment of the ready magazine(s) may be required from non-ready stowage. This may be done by the crew (as in the LeClerc) or automatically (as in the Navy's MK45 5-inch gun), depending on manpower, configuration, and human engineering constraints. Some specified number of rounds should be in a ready location available for automatic loading to support a sustained rate of fire. In the case of the Soviet tanks, the ready rounds are located in a carousel below the turret floor. Non-ready rounds are manually replenished from positions located throughout the tank. This approach provides a positive impact on lethality at a cost in survivability and manpower.

Survivability

Survivability includes many elements - lethality, mobility, configuration of the system, and measures to reduce vulnerability, both active and passive. The autoloader design must support reducing silhouette, compartmenting the crew from ammunition, armor protection of critical areas, warhead anti-fratricide protection, venting of propellant fires, and positioning of the ammunition to reduce vulnerability. The combat system configuration and autoloader design will include these features, but is also subject to weight and space constraints required to meet mobility, transportability, and maintenance requirements.

To reduce the combat system's silhouette constrains the location of both the autoloader components and the ammunition stowage (magazines). Additional height also implies additional armor weight. If ammunition is stowed high (say, in the bustle) the armor envelope is extended to protect that ammunition and critical autoloader components. This is a penalty that the vehicle system designer is loath to pay. The design goal then shifts to molding the autoloader and ammunition stowage into minimum space, and locating as much of the ammunition as low in the vehicle as possible. This was the approach taken with the Tank Test Bed. The crew was lo-

cated in the hull, and the turret basket was then used for the autoloader and ammunition storage. This approach allowed a reduction in silhouette, which improved survivability; but the design precluded any degraded mode operation and was heavily reliant on optics and sensors to maneuver and fight the tank.

If the ammunition is compartmented, the operation of the autoloader must be compatible with the method used. The autoloader must have rapid access to the ammunition, yet minimize the exposure of the crew compartment to the stowage area. Orientation of the ammunition must be considered to minimize the danger of a high-explosive detonation compromising the compartment. There should be provision for venting blast overpressure of high-explosive warheads and propellant fires.

The use of an autoloader has both positive and negative impacts on the operation of the ammo compartment feature. Ammunition will be in the gun or in the compartment without requiring manual contact during the loading operation. Ammunition exposure time and size of the access door can be minimized.

However, the penalty is that the acceptable location and configuration of the compartment will further restrict ammunition stowage and autoloader design. (Hull stowage of ammunition may be more difficult to vent without damaging the engine compartment or suspension). Another method of increasing survivability is to reduce the *density* of ammunition stowage, decreasing the possibility of exceeding the venting ability of the compartment. This conflicts with the maximum storage of ammunition and may cause a reduction in the onboard load of ammunition.

Another desirable feature is warhead antifratricide protection. This involves designing obstacles to the shock waves that cause propagation of nearby high-explosive warheads when one is hit. This allows the blast overpressure and venting systems to operate, saving the crew compartment. This feature may be built into ammunition stowage mechanisms, the autoloader, or both.

The density of ammunition stowage, size and type of warhead, and the distribution of KE and HE warheads also has an effect on fratricide. If the autoloader can maintain and control the location and distribution of ammunition inventory, it can decrease the fratricide hazard. However, antifratricide materials decrease the density of ammunition stowage and complicate the operation of the autoloader. Survivability has been, and continues to be, a primary consideration in the design of U.S. combat systems. It involves more than armor protection. Its impacts on autoloader design reflect the integration issues which establish system configuration.

Sustainability

The first element of this principle is reliability. This has not been an issue in the past, because the capabilities of the human loader were known. The reliability of the autoloader will have a profound impact on the system's availability. (An underlying implication is that the autoloader be no less reliable than the current loader.)

Two strategies suggest themselves. First, that the autoloader be so reliable that the infrequent loss of the autoloader is considered an acceptable loss of the system. The second is that the autoloader can be serviced manually if a failure occurs, possibly at some degraded capability, until the system can be repaired. The first strategy will be more difficult and costly to achieve. The second will require that each possible failure be identified and a backup designed for it. Either strategy will have penalties associated with it related to the number or effectiveness of the operational systems available.

The materiel developer, based on design analysis and empirical data, will identify the autoloader's failure modes and their effect, and analyze their criticality. He will then project how frequent and how severe the failures are likely to be. The end product will be a subsystem criticality matrix which will identify priority failure modes and provide information on how to design the autoloader to support the system reliability requirements. However, there is an inadequate current data base on autoloader reliability to confirm the design analysis. Information will be acquired only as present and future autoloader systems are developed.

The maintenance concept for the autoloader will also affect systems design. Maintenance procedures should be designed to occur at the lowest level of support possible. Diagnostic techniques have to be established. Maintenance engineering identifies what components will be classified as repairable, partially repairable, or non-repairable. The system design will have to allow for efficient location of maintenance points, and sizing of components and access for autoloader and magazine removal. However, these features cannot compromise the system survivability mechanisms

The autoloader bustle magazine of the MBT-70 project, now stored in the Patton Museum.

(armor, compartments, venting). The system availability requirements established by the combat developer's analysis are used to refine the maintenance concept. The availability values help the designer to establish mean time between failure (MTBF) and mean time to repair (MTTR) goals for the autoloader subsystem. The maintenance concept and these goals will drive design decisions and trade-offs that help define the configuration of the autoloader. The design of the autoloader can facilitate the rearming of the combat system. The autoloader designers should be sensitive to logistics concerns, and the autoloader and rearm method should be compatible. If the rearm is manual, the autoloader can be designed to make the transfer more efficient. A good example of this is the design of the MBT-70, which allowed for manual feed of ammunition directly into its rotating bustle magazine through a rearm port at the rear of the turret. A future armored rearm vehicle might offer the possibility of automatic transfer of ammunition. If the rearm is to be automatic or mechanically assisted, this introduces a new interface requirement for the system. A docking method and data link might be required to accomplish the transfer. The advantage would be in providing rapid, under-armor, and possibly, NBC-clean rearm for the tank. The disadvantage would be increased complexity, cost and force structure impacts.

The automatically loaded tank introduces a new armament system component not previously included in the armor system design. This component replaces functions previously performed reliably and efficiently by man. Man represents a known quantity whose capabilities and limitations have been established by experience. The introduction of the autoloader, in fact, is necessary because those limitations are exceeded by the requirements of the armament system. The designer of an autoloader is faced with the challenge of replacing a "system" that is flexible, reliable, and able to be reprogrammed or replaced if necessary. The new component must also be reliable and maintainable. It will have to perform several distinct operations, and must be supportable by Army logistics systems. Whether the tank can accommodate the loss of a crewmember without some loss of capability is debatable. The issue for the designer is to develop a supportable system which can efficiently load the cannon.

Conclusion

The first step in developing the autoloader is to identify the required capabilities of the system. These capabilities are established by the combat developer (user) in response to analysis of required combat effectiveness, including such factors as the threat, availability of applicable technologies, and operational and support costs. This analysis results in the definition of critical performance characteristics required to efficiently defeat the threat. The materiel developer then uses these requirements as design goals for the autoloader, and formulates a concept that will support the goals.

The development of the autoloader continues to be driven by the user's requirements, but the combat and material developers must retain a flexibility in approach that can allow the trade-offs that will occur. The prioritization of requirements, and consideration of the benefits and the associated penalties of various autoloader strategies, will define the most effective system design for the autoloader developer. The developer thus supports the efficient integration of the autoloader into the combat system.

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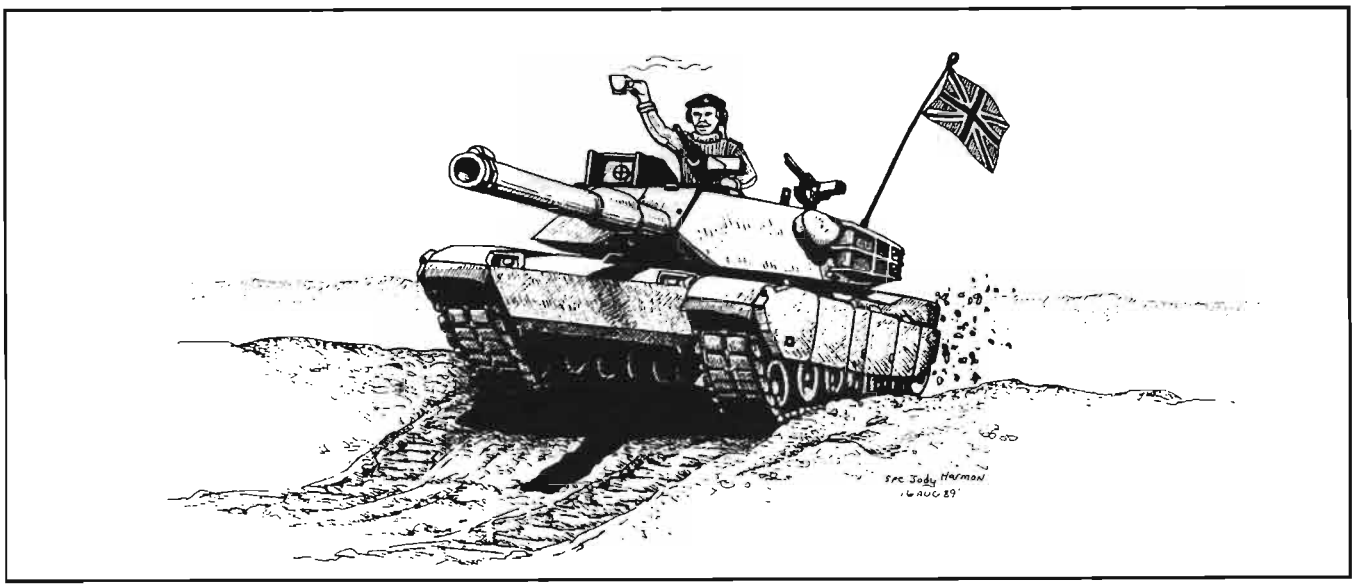

As Others See Us...

A British Tank Squadron Tries the M1A1

by Major D. I. Viccars, C Sqn., 3d RTR

(Reprinted with permission from TANK, the Royal Tank Regiment Journal)

Soldiers of C Squadron, 3 Royal Tank Regiment, had a good chance to take a detailed look at the M1A1 during a visit to 2/70 Armor Battalion at Grafenwohr.

This article is not intended as a technical critique of the Abrams; rather it is compiled from the views of 20 soldiers who drove and fired the tank over a two-day period. Admittedly, two days is insufficient to judge the effectiveness of a main battle tank; however, it is long enough to create an impression...

The most impressive part of the tank is the turret. It is well laid out, the main armament having an extremely easy loading and firing sequence and seeming to be very accurate. The author achieved three first-round hits in about 30 seconds, against a mover at 1,200 meters, a static target at 1,500 m, and a mover at 1,800 m, all this with no prior instruction! It is therefore a very easy tank to fight. Reservists, for example, would have no difficulty at all in climbing in and operating the vehicle efficiently. Fixed ammunition is a considerable advantage to the crews and gives a really fast loading time. The sighting and firing sequence and the gun control equipment is again really slick and simple to use. There is no complex graticule, no ellipse, no autolay, etc. All the gunner has to do is lay a circle on the target, press one button on the joystick-type gunner's control, then immediately press the adjacent firing button – shouting "On the way" at the same time!

The relief with which British crews greeted a simple, clear, gunner's sight had to be seen to be believed. Automotively, the tank seems easy to maintain and repair, and boasts some amazingly obvious and simple features which make life so much easier for the crew. For example, the tracks are tensioned hydraulically, all the batteries are side-by-side in a separate armored compartment next to the engine, and as many as possible of the oil reservoirs are see-through plastic, even the road wheel hubs! It is also very easy, and quick, to remove and replace the engine and transmission.

In addition, the United States maintenance troops have a large number of test equipments rapidly to isolate and identify the damaged component.

Sadly though, Abrams does seem to suffer from as many electrical problems as Challenger. In addition, the M1A1 is not a vehicle that crews could easily live on. Meals are prepared elsewhere, there is

limited stowage, limited tentage etc. A summary of our views follows at the end of this article, though it must be remembered that these opinions were formed during a two-day visit, and more time on the vehicle is required to obtain a detailed comparison. However, the majority view of the party was that they would prefer to go to war on Challenger, rather than Abrams; but if the fire and gun control system of Abrams was put in Challenger, the general belief was that Challenger would then be outstanding.

Summary of 3 RTR's Views

OUR LIKES

- Turret, Fire Control and Armament
- The gun, its sighting and control equipment.
- Hydraulic gun control equipment which is easy to start, quick and very responsive, as well as being fast.
- Stabilized sight.
- The gunner's graticule - clear, simple and easy!
- Good, simple muzzle reference sight.
- Easy, simple fire control orders.
- Firepower – 120-mm smoothbore; 2x7.62mm, 1x.50 cal.
- Fixed ammunition; rapid loading drills.
- Ammunition stowage in the turret with built-in "blow-out" panels to vent any explosion out of the tank, rather than into the crew compartment.

Power Plant and Suspension

- Remarkably quiet engine, with rapid acceleration, and very easy to operate.
- Hydraulic hand brake, quick and easy.
- Very responsive steering.
- Multi-fuel capability.
- Very easy maintenance.
- Rapid engine repair and change.
- Batteries stored, all together, under armor, adjacent to the engine, therefore easy to change and service.
- Clear plastic oil reservoirs for easy level checks, etc., even on the road wheel hubs.
- Hydraulic track adjusters.

Communications and Crew Arrangements

- Secure communications to platoon/troop level.
- Well laid out crew stations, especially the driver's.
- The internal lights are blue, thus there is no loss of night vision.
- Excellent crew seats.
- Excellent crewmen's helmets, very comfortable.
- The very effective heater!

General

- Smooth, wide, warm back decks - good to sleep on!
- Small, low profile.

OUR DISLIKES

Turret, Fire Control, and Armament

- Commander (apparently) cannot lay gunner sight onto target.
- No wiper on gunner's sights!
- Thermal imaging equipment very poor in comparison to TOGS. (TOGS is the British thermal sighting system. -Ed.)
- It takes some three hours to remove the TLS.
- High profile, exposed gunner's sight with large, vulnerable glass area.
- Commander has only limited control and checks over the gun and turret.
- Prone to electrical unreliability – especially in the turret.
- Very limited gun control back-up system, should the main system fail, but very good emergency firing gear.
- It appears that the stub cases left once a round has been fired tend to jam in the breech.
- The gun safety shield is not permanently fitted, but has to be assembled before firing.
- Short barrel life.

Power Plant and Suspension

- The hand throttle in the driver's compartment. We would prefer foot-operated controls.
- Over-sensitive computer to control the engine.
- Brakes are, if anything, TOO responsive!
- Poor suspension when compared to the excellent system on Challenger.
- Very, very thirsty. The ready reckoner used was 2-1/2 gallons to one mile.
- No generator engine.
- Short track life.
- Rear skirting plate allows mud to build up around sprocket, thus encouraging a thrown track.

Communications and Crew Arrangements

- Antiquated radio equipment, with old audio gear and only one radio per tank, as a standard kit.
- Limited stowage space, all exposed to the elements.
- No provision to enable crew to live on the vehicle.
- No internal water tank for the crew.
- No boiling vessel!
- The heater is located next to the driver – it burns his left arm!

General

- Bad thermal signature.
- Armor – we like Chobham!

Deceptive Maneuver

by Captain (P) James F. Merkel

The task force commander waited impatiently in his TOC as his unit concluded final preparations of defensive positions. After conducting intelligence preparation of the battlefield (IPB), his S2 estimated the enemy would attack with a tank battalion on the northern avenue of approach and a motorized rifle battalion on the southern avenue into the battalion's sector. After analyzing the terrain and conducting his commander's estimate, the commander determined there were two critical choke points, one along each avenue of approach, both parallel to one another. In issuing his guidance, the task force commander assigned Teams A and B the missions of defending the two choke points, arrayed Team C in depth to handle any enemy forces leaking through, and kept Team D in reserve as a counterattack force (see Figure 1).

Later that night, reports filtered in of enemy reconnaissance patrols along the two avenues of approach. There were reports of subsequent probes of defenses at the two choke points, and between 0430 and 0515, there were reports of movement of the forward security elements of the two enemy battalions along their corresponding avenues of approach. As the situation developed, defenses engaged the forward security elements at the two choke points. The battle seemed to be going the way the S2 predicted. As the battle progressed, Teams A and B initially held fast and began attriting the forward security element. Movement of the enemy's main body was reported. Suddenly, Team A reported large numbers of tanks in its sector, many of which had penetrated its defenses into its rear area. As reports continued, the picture became clear. The enemy had fixed forward defenses with the motorized rifle battalion, massed the armor battalion and penetrated the battalion sector along the northern avenue of approach. As the battle progressed, enemy forces bypassed a majority of the task force's defenses, penetrating deep into the rear area (see Figure 2).

What went wrong? Initially, the situation seemed to be in hand. How was the commander so deceived, and his defensive scheme thrown off balance?

The plight of the task force commander in this vignette is not unfamiliar to those who have fought at the National Training Center. What appears to be isn't always what is. The enemy's scheme of maneuver clearly deceived the task force commander and his subordinates, resulting in a rout.

During the course of this article, keep this vignette in mind. The focus will not be on the defensive tactics employed, but on how the task force commander fell victim to deceptive maneuver. His actions typify those falling victim to deception. By understanding how one falls victim to stratagem, we may learn how to deceive an opponent.

With the Army's revitalization of deception and its associated re-education process, commanders are pondering ways to effectively integrate this combat multiplier into their operations. The Army's current doctrine on deception, as expressed in FM 90-2, *Battlefield Deception*, October 1988, provides some basic doctrinal guidance on planning and executing deception operations, but has little depth in terms of practical application. The manual's shallowness largely stems from writing doctrine after nearly a 40-year void of Army interest and experience in deception operations. Examples of deception operations at the strategic and operational levels of war abound throughout the history of warfare, but those at the tactical level are woefully few.

But what of those who practice the art of warfare at the tactical level? Does lack of recorded history mean that deception isn't applicable or applied at the tactical level? Most certainly not. Then how does the commander integrate deception into his scheme of maneuver? I believe this will become clearly evident in the remainder of this article. Before proceeding further, let's define deception and further subdivide it into types.

JCS PUB 1-DOD defines deception as "those measures designed to *mislead enemy forces* by manipulation, distortion, or falsification of evidence to induce him to *react* in a manner prejudicial to his interests

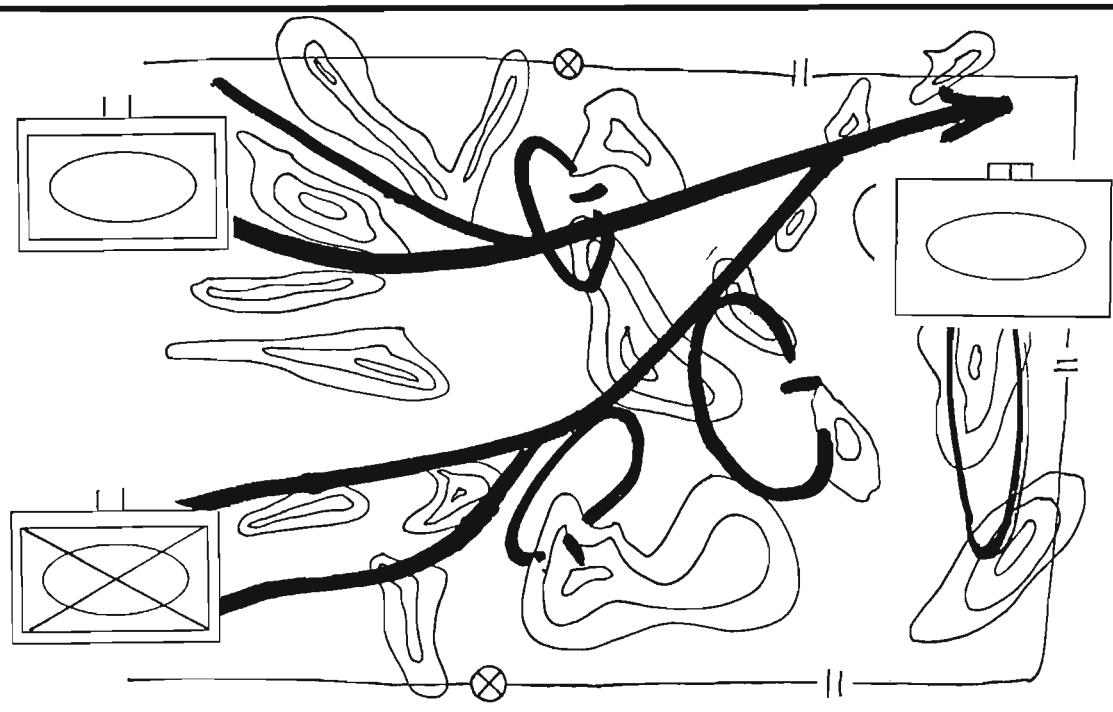

Fig. 1 Anticipated Enemy Scheme of Maneuver

(emphasis added)." Note, the act of misleading the enemy commander (the deception target) is to induce a reaction, not to merely convince him of a particular falsehood. This desired reaction (the deception objective) should be expressed in terms of committing, failing to commit, or delaying commitment of his forces in a particular manner. The stated objective must be within the realm of the enemy's capability and the target's authority, support the scheme of maneuver, and be exploitable by friendly forces.

Deception can be subdivided into two basic forms, ambiguity (A-Type) and misleading (M-Type).' A-Type deception increases the ambiguity in the victim's mind and lowers the probability of a correct perception by "dilution" or multiplication of alternatives. Survivability measures such as camouflage, employment of multispectral decoys as alternative tar-

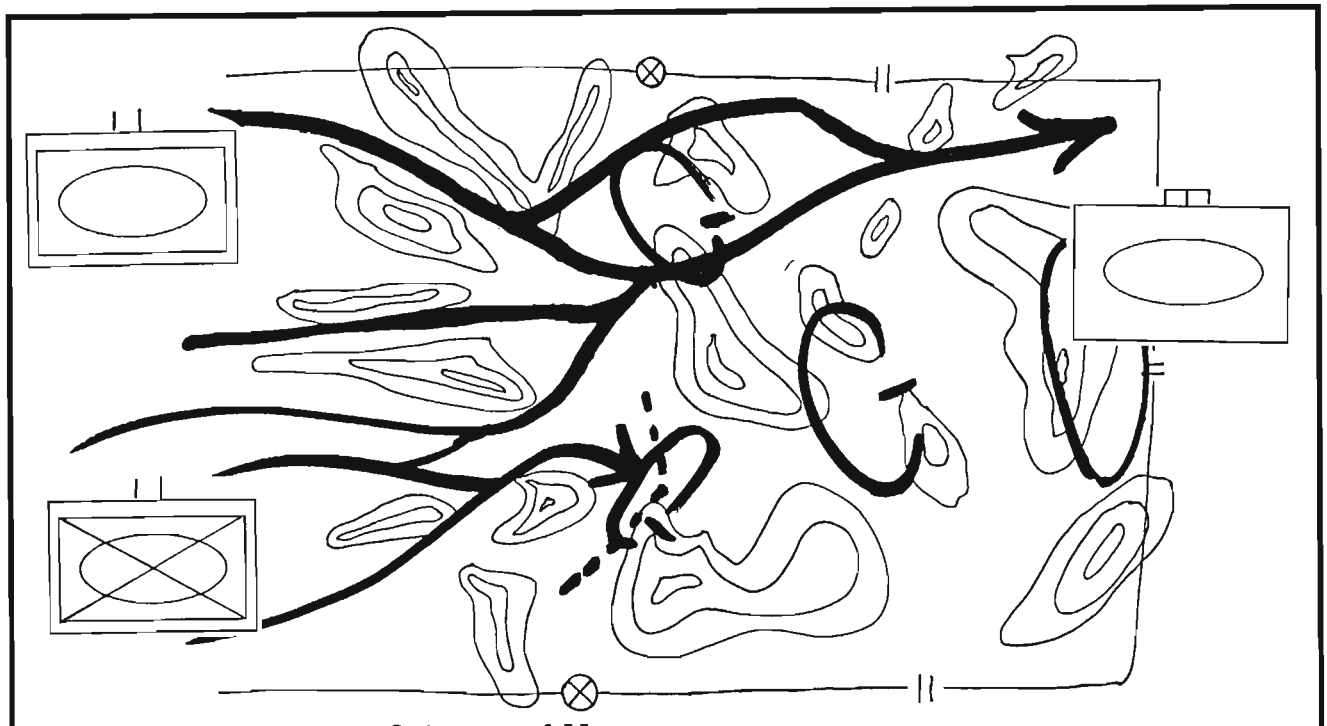

Fig. 2 Actual Enemy Scheme of Maneuver

DECEPTION TIME CYCLE

- **Time of maximum disadvantage**
- **Enemy force execution**
- **Enemy commander's decision**
- **Enemy Intelligence System**
- **Execution of deception tasks**
- **Dissemination of deception plan**
- **Planning**

Fig. 3

gets for enemy gunners, and radio listening silence fall in this category. Such measures are applicable to and should be integrated into all operations.

A-Type deception measures affect the enemy commander's decision cycle by depriving him of indicators revealing friendly intentions. Elevating the target's ambiguity forces him to react in one of two ways. Ambiguity may cause the enemy commander to delay committing forces to gain a clearer picture of the battlefield. This essentially reduces his reaction time, shortens his decision cycle and potentially makes him more reactive. Conversely, he may risk committing his forces without a clear understanding of the situation. Such a reaction makes the target unpredictable and could result in an unexpected and/or undesired enemy reaction.

Misleading deception, although more difficult to employ, is the most decisive form of deception and yields the biggest payoff. M-Type deception reduces the ambiguity in the victim's mind by convincing him that a particular falsehood is true. His reaction is then based on the falsehood. If possible, the deception should play upon the target's predispositions.

Returning to our vignette, the commander was already predisposed to believe the enemy would attack along the two avenues of approach entering his sector. IPB and his analysis supported this. Initial reports received during enemy recon probes and the following actions of the forward security element further reinforced his preconception. Until the time he received reports of the breakthrough, situation reports from subordinates reinforced his initial estimate.

One of the problems in employing M-Type deception is the amount of time required. Time is less critical in more static scenarios, such as defenses and pre-hostility deployment. However, once hostilities are initiated and maneuver begins, time available to present a deception story to the enemy decreases rapidly. The speed of modern weaponry drastically cuts the time available to conduct deception operations. As a result, time required to conduct deceptive ploys must be reduced to a level allowing integration of the deception into the scheme of maneuver. Before I can address the problem of time reduction adequately, one must first understand the deception time cycle.[2]

The deception time cycle is essentially a variation of the reverse planning sequence (see Figure 3). Time assessment, while critical to all operations, is essential to deception planning.

Improper analysis of time will result in deception events unsynchronized with the flow of the battle. This ultimately results in failure of the deception and missing windows of opportunity to decisively engage the enemy. The first step in deception time analysis is to determine the time of maximum disadvantage. At what point is the enemy most vulnerable during the battle? When do we want his reaction to occur? Such information will most likely be determined by wargaming the battle, analyzing its flow, and identifying trigger points keying actions affecting the tempo.

Once the time of maximum disadvantage is determined, the enemy forces affected by the target's decision must be considered. What size force? If the objective is to cause the target to move forces, how long will the move take? If the objective is to cause a delay in committing an enemy force, such as his reserve, for how long? Time must also be allowed for the target to issue orders and his forces to react to them.

Next we must consider the enemy commander. Is he bold or cautious? Does he rigidly adhere to doctrinal principles? How much latitude does he have in altering his current course of action? Usually at the tactical level, little is known about the personality of the enemy commander. Assumptions about him must then be based on his doctrinal and sociological norms.

In further considering the commander, we must consider the amount of time he needs to analyze the situation, reach a decision, and

"Deceptive maneuver is essentially maneuvering forces on the battlefield in such a way as to lead the enemy commander to an incorrect estimate of the situation...By causing an incorrect estimate, we hope to gain a tactical advantage by throwing the enemy off balance..."

formulate and issue orders. At this point, the enemy's communication system must also come under scrutiny. How long will the commander need to transmit orders to his subordinates? What are the potential disruptions to his C3? The potential effects of friendly C3 countermeasures?

For the target to assess the situation and make a decision, he must have information. At this point, we must assess the amount of time required for the enemy to gather information, produce an intelligence product, and provide it to the commander. Information may come as intelligence summaries from the G2/S2 or may be in the form of spot reports from subordinate commanders. Ideally, specific enemy intelligence collection assets should be identified as means of channeling deceptive information to the enemy commander.

Portraying the falsehood is accomplished by executing events or deception tasks supporting the deception story. The deception story is the incorrect estimate of our situation we wish the enemy commander to believe as true. Conducting demonstrations, feints, displays, and other such deceptive events requires time. We have to determine the amount of time needed for units to execute the required deception events. Once the time required to disseminate the plan is added, what remains is available planning time. As evidenced by the deception time cycle, conducting deception operations can be rather time consuming. Deceptive maneuver is a means of reducing the time cycle to a manageable level.

Deceptive maneuver is essentially maneuvering forces on the battlefield in such a way as to lead the enemy commander to an incorrect estimate of the situation, as occurred in the vignette. By causing an incorrect estimate, we hope to gain a tactical advantage by throwing the enemy off balance, causing him to fight with forces out of position or poorly deployed. The enemy commander's incorrect estimate should arise from his analysis of logical flow of events upon the battlefield.

Place yourself in the TOC of our task force commander. As the reports from subordinate units trickled in, he began to build a mental picture of what he believed to be the enemy course of action. In his mind, he was already predisposed to what he thought to be the enemy's intentions and had so positioned his forces. At the point the task force commander became convinced his perception was accurate, he could have either remained committed to his current course of action or modified it based on his perception of the threat – a reaction.

What was the primary source of intelligence for this reaction? HUMINT reports from subordinate units. Did other forms of intelligence weigh in? Certainly, but reports from subordinate units in direct observation and/or contact with the enemy carry the most weight and are usually the most timely. Was additional buildup time other than the execution of the scheme of maneuver required? No, our commander's estimate of the situation was based entirely on his perception of the enemy's scheme of maneuver as it logically unfolded before him.

Note that sources of intelligence other than the HUMINT threat targeted by deceptive maneuver usually require more time for collection, processing, and analysis. In looking back at the deception time cycle, you'll note that deceptive maneuver resulted in information quickly reaching the target. Furthermore, portions of a story portrayed by deception events targeting enemy SIGINT or IMINT collection assets may not be detected or may be misinterpreted by analysts, never reaching the target. By using maneuver forces to portray the deception story, chances of events being detected are greatly increased due to the amount of forces involved and their close proximity to the enemy.

Because forces committed to deceptive maneuver are integrated into the overall scheme, time isn't wasted portraying static events, such as displays. Therefore, deceptive maneuver reduces the time required to portray the deception story. Virtually all movement and supporting actions are purposeful, contributing directly to the success of the overall scheme of maneuver. As a result, troops and equipment are not diverted to support isolated decep-

tion events, potentially draining the unit of combat power. The primary means of portraying the deception story is a series of feints and demonstrations by combined arms forces maneuvering in close proximity to the enemy. Sequencing of supporting events must permit forces to be shifted and massed quickly without disrupting the logical flow of the battle. To cut the enemy commander's reaction time, we must keep him deceived as long as possible. What are the keys to making all this work? First, you must put yourself in the target's seat and look at the battlefield through his eyes. Given time, careful reconnaissance of an enemy's positions may reveal his intentions. Lacking time, one must rely on knowledge of threat doctrine and reverse IPB. This may seem relatively simple for peacetime exercises against other U.S. forces. We operate from the same doctrine, learn in the same military schools, and also think relatively the same. This isn't true of Soviet forces. Not only do they have different doctrine, they also think differently. Cultural differences have produced a different mindset. The Soviet leader is much more logical and his solutions must be quantifiable. So, what's the answer? Know your enemy. Understand the decision-making process of your Soviet counterpart. Understand the limitations of his authority as a commander. Don't abdicate your responsibility to know your enemy to the intelligence community. Although making significant contributions, the G2/S2 won't plan the scheme of maneuver. More important, he can't, as competent as he is, magically emplace "gut" feelings that maneuver commanders need to make quick decisions on the battlefield. Part of developing these "gut" feelings is to know your opponent and how he thinks.

Another key to employing deceptive maneuver is security. The most brilliant maneuver ploys in the world will not survive poor security. An aggressive counterreconnaissance plan must be developed and strictly adhered to, both in the tactical assembly area and enroute to the objective. Radio silence and other forms of signals security contribute to hiding forces, as do camouflage and proper terrain driving techniques. To successfully present a false picture to the enemy commander, we must hide our true intentions.

Although I have geared this article toward mechanized forces, the same fundamental principles apply to light forces. I have deliberately omitted discussion of deception devices, such as multispectral decoys and communications deception equipment. Although they enhance deception operations, most units do not have access to them. Units must learn to integrate deception into their scheme of maneuver without relying on special equipment.

The keys to making deceptive maneuver work are relatively simple. One must devise a scheme of maneuver focused on throwing the enemy off balance, gaining a tactical advantage. To do this, the commander must know his enemy. Once the plan is in hand, forces must execute it with the utmost security. Such a plan, synchronized and aggressively executed, will greatly increase a unit's chances of both surprising and defeating the enemy.

Notes

[1]Daniel, Donald C. and Herbig, Katherine L. (eds.) Strategic Military Deception, New York: Pergamon Press, 1982, pp. 5-6.

[2]FM 90-2, Battlefield Deception, October 1988, pp. 4-9, 4-10.

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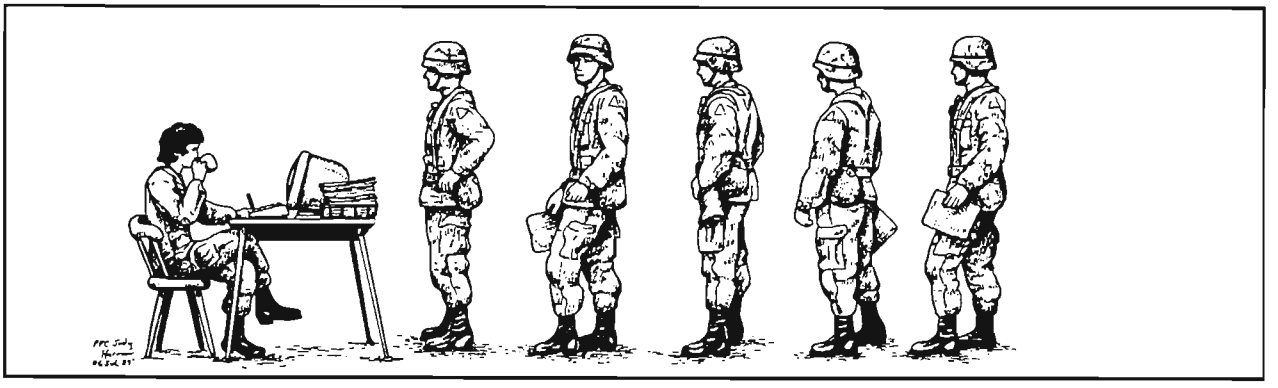

Training for Replacement Operations Warfighting

by Major Jon H. Moilanen

The key to success in any combat operation hinges on the ability to sustain weapon systems and operators. This staying power is the essential mission for the combat service support leader. The on-going challenge for personnel services leaders and soldiers is to train warfighting skills to standards that successfully support AirLand Battle concept.

Whatever the training exercise, it is critical to effectively reinforce the battlefield through timely replacement operations. Unit strength maintenance alone is insufficient. Weapon systems must be manned by trained operators in proper rank and skill to achieve the best unit warfighting performance and mission success.

The Administration Module (GTA-101-2-1) and the *Personnel Administration Center Drillbook* (TC 12-16) are aids that can improve combat service support training. These tools focus on effective maintenance of unit personnel strength and weapon systems readiness. With a system to train forecasting, procuring, and assigning replacements, the S1 and PAC have a framework for an effective operational aid too.

Commander priorities, unit losses, and unit reorganization capabilities establish a basis for replacement allocation. The Administration and Logistics Center coordinates the linkup of operators and equipment. The Administration Module incorporates basic unit directives and reference material. The result is a simple system to train subordinate leaders and soldiers in garrison or field environments, and to execute actual operations.

Within this framework, *The PAC Drillbook,* provides the fundamental drills necessary to accomplish replacement operations. The concept reinforces individual skills into a collective administration effort. The PAC and S1 efficiently account for, report status of, and replace soldier requirements.

The training technique in the *PAC Drillbook* is progressive through five steps. First, explain the specific drill, its purpose, and performance standard. Second, conduct a "walk-through" of the drill and demonstrate acceptable performance. Third, practice the drill at a reduced pace to develop individual and group proficiency. Provide feedback to enhance individual performance and teamwork. Fourth, perform the drills in "real-time" situations and incorporate varied tactical constraints. The final step is formal evaluation and feedback. Training shortfalls are trained to the performance standard. Once all performance is achieved to acceptable levels, maintain individual and group skills through regular exercise.

Training for warfighting does not stop here. Cross-training of skills is essential. Battle losses of administration personnel must be anticipated. Sustained operations, duty shifts, and physical-psychological fatigue are considerations also. Leaders must weave a redundant skill capability into managing replacement operations.

Evaluations at the NTC identify recurring problems in effective personnel combat service support. Common problems are:

- Battle rosters not kept up to date.
- Incomplete and inaccurate unit reports.
- Unit commanders not aware of actual unit strength.
- Incorrect strength data from subordinate units or to higher headquarters.
- Non-standard reporting procedures.
- Delayed unit reports or no established reporting time.
- Commanders not kept informed on unit strength and critical losses.

• Inability to maintain accountability and strength data on cross-attached units.

Unit SOPs can remedy much of this information flow problem, and can clarify specified or implied missions of logistical support. A basic reference library of publications can enhance methods, improvisations, and planning for operational readiness.

Administration personnel normally maintain a tactical situation map in conjunction with the S4. Training opportunities are limitless. Locations of supported and supporting units reflect current situations that influence service support decision making. Post time-distance factors and movement restriction. Incorporate proper radio telephone procedures and CEOI into training drills.

Once the Admin-Log Center is organized to support the unit, training scenarios can provide individual and collective experience in problem-solving. Minimum resource commitment can produce excellent learning. Logistic team leaders such as the adjutant, supply officer, support platoon leader, personnel service sergeant, supply sergeant, and clerks gain valuable experience in procedural methods and decision-making. There is no better preparation for actual employment, than to practice with the same tools that will be used in actual operations.

The Administration Module uses simple data displays. Battle rosters present name, grade-rank, military occupational specialties, authorized and assigned personnel strength, current status, and special remarks. At battalion level, the basic unit for strength management is the platoon. To focus on strength within platoons improves monitoring cross-attachment status as teams and task forces are organized. There is no magic to the Administration Module. Capitalize on integrating SOPs with simple information displays.

PAC drills practice the execution of several essential administrative actions. The PAC logs unit strength information and ensures accurate and timely reports. Supervisor screening of documents ensures quality control. Duplication as well as erroneous data are purged from the data base. For example, the PSNCO reviews the Personnel Requirements Report to ensure that it reflects actual needs and not vacancies. If a cook is driving a truck, the requirement may be for a truck-driver, not a cook.

One hundred percent accuracy is the goal of casualty reporting. Battle rosters show current requirements. Prepare associated administrations such as casualty transmittal letters and next-of-kin letters. Keep the executive officer and commander informed on changes critical to unit strength.

Quality in-processing of replacements is essential to morale and the fighting spirit of the unit. A positive experience upon arrival into the unit sets the theme for soldier performance. The initial PAC reception must reinforce a success attitude, and build confidence in the most important element of combat power, the soldier.

As soldiers arrive from the replacement detachment, process orders and records expeditiously. Initiate normal SIDPERS actions.

The replacement process includes a thorough orientation on unit mission, the enemy, and current situation. Unit history and tradition reinforce the confidence a soldier feels in his new unit. He will feel that he is important and part of a winning team.

If delays prevent the timely linkup between the soldier and his unit, ensure proper billeting and messing for the soldier until transportation delivers him to his unit.

The NTC has identified a recurring principle in CSS operations. Successful units rehearse service support drills thoroughly in their home station training. SOPs function well only when practiced often. This observation is not surprising.

The transition of a training aid for wargame simulations or command post exercises to a regular operational tool in daily garrison or field operations is a logical progression. Peacetime training procedures of replacement operations should be as similar as possible to those procedures for the operational service support plan.

This article demonstrates the value of a system with simple and effective training measures. Use the Administration Module, GTA 101-2-1; and TC 12-16, the *PAC Drill Book*. They work.

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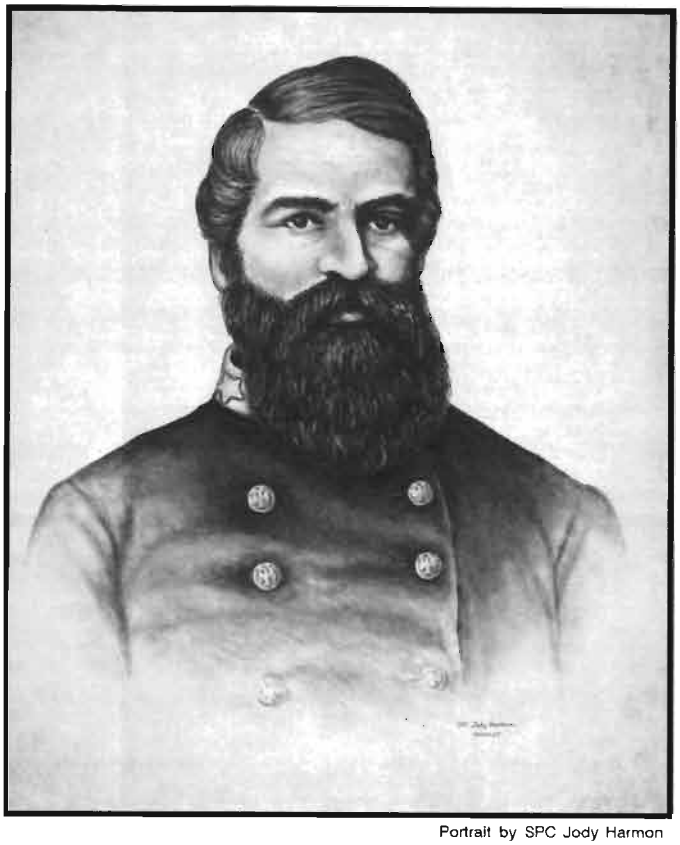
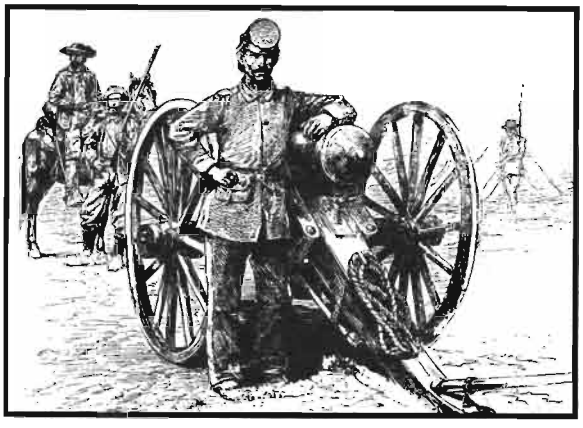


Portrait by SPC Jody Harmon



Ashby Is Here!...

Turner Ashby's tiny cavalry force bedeviled 60,000 Federal troops in the Shenandoah Valley, keeping them from attacking Richmond

by MAJ Patrick J. Cooney

Spring finally came to the Shenandoah Valley. The Confederate soldiers of Jackson's command enjoyed flowering trees and birdsong in the warm sunshine. They had spent an unpleasant winter at Winchester and were ready for warm, dry weather and the campaign season that came with it.

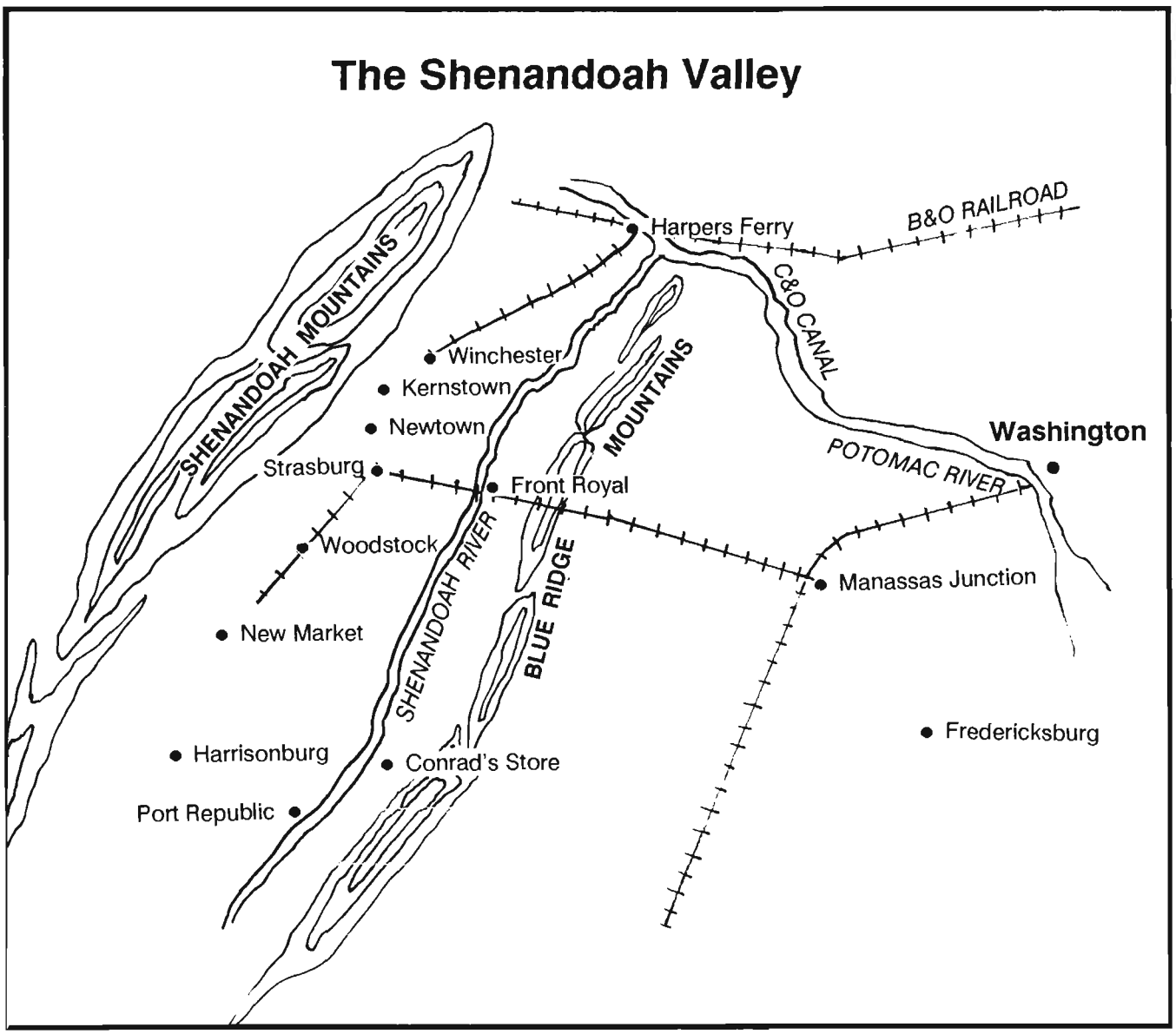
With the Shenandoah Mountains to the west and the Blue Ridge Mountains on the east, farmers were busy planting crops in the valley's fertile soil – crops that would feed the armies of the South in its struggle for independence. This spring of 1862 would not be idyllic, though, because Yankees were in the valley, and someone would have to deal with them.

These gray-clad soldiers, under the command of Major General Thomas J. "Stonewall" Jackson, began the spring campaign with hopes of victory in this second year of the war. There were initially fewer than 1,000 of them, but they would make history by keeping 60,000 Union soldiers busy – soldiers who would otherwise be attacking the Confederate capital, Richmond. To accomplish this feat, Jackson would need the help of Turner Ashby.

Turner Ashby knew this part of Virginia. He had grown up at "Rose Bank" in Fauquier County. As one of six children, Turner received his education from his mother and at Major Ambler's Academy. Like N.B. Forrest in the West, he possessed no formal military training, but had learned about the War of 1812 by reading his father's diary. His grandfather had fought in the War for Independence, and his great-grandfather had fought in the French and Indian War. The most valuable lessons, ones that would serve him well in the coming conflict, were not learned in a classroom; they were learned on horseback in hurdle races, fox hunts, and tournaments, activities in which Turner excelled. These contests developed his mastery of horsemanship, audacity, and innovativeness, as well as his ability to think and act independently.

After the death of his father, when Turner was six years old, Turner and his brothers, Thomas and Richard, helped run the family farm at "Rose Hill." In the late 1850s, railroad gangs pushed the Baltimore and Ohio Railroad through Fauquier County, and their rowdiness got out of hand. Turner and Richard organized a group of local riders to restore order and maintain the peace. This group became the nucleus of what was later known as Ashby's Rangers.

When Ashby received word of John Brown's raid on Harpers Ferry, in October 1859, Ashby



called his men to action. They rode to Harpers Ferry, only to find Brown already in jail. They remained to perform picket duty along the Potomac River to prevent any abolitionist attempt to rescue Brown. After Brown's hanging, the group stayed together as Ashby's Mountain Rangers. War came to Virginia in April 1861, when the state declared its secession from the Union. Angus McDonald, a West Point graduate and a veteran Indian fighter, offered his services to Jefferson Davis. He received a colonelcy of cavalry and instructions to form a regiment. McDonald had in mind a partisan border war – raids on lines of communication and supply routes along the Potomac River. Turner, Richard, and their men were among the first to join McDonald's new regiment, which became the Seventh Virginia Cavalry. This opportunity was what the Ashbys had been waiting for. As the Ashbys set about their mission of disrupting Union lines of communication, McDonald saw immediately the natural leadership abilities of Turner and wrote to the Confederate secretary of war requesting Turner's promotion to lieutenant colonel. "I need not speak of his qualities, for already he is known as one of the best partisan leaders in the service. Himself a thorough soldier, he is eminently qualified to command."

The Ashbys and their men became the scourge of the B&O Railroad and the Chesapeake and Ohio Canal. They cut telegraph lines and interrupted east-west traffic by destroying tracks, bridges and docks. Ashby soon added combined arms muscle to his cavalry, a three-gun battery of mobile horse artillery, commanded by 18-year-old Robert Chew, a VMI graduate. Cap-

tain Chew's battery was the first horse artillery unit formed in the Civil War.

In late summer, during a raid on the B&O, Richard ran into a Federal patrol. In trying to escape, Richard's horse stepped into a cattle guard and threw him. The Federal horsemen set upon him. They shot and bayoneted him several times, leaving him for dead. Turner found his brother a few hours later and carried him to a house owned by a grandson of George Washington, where he died eight days later. Contemporaries said that from that moment on, Turner had only revenge in his heart.

From one of Ashby's officers, John Estes Cooke, we get a picture of Turner as, "a man rather below the middle height, with an active and vigorous frame, clad in plain Confederate gray. His brown felt hat was decorated with a black feather; his uniform was almost without decorations: his cavalry boots, dusty or splashed with mud, came to the knee; and around his waist he wore a sash and leather belt, holding pistol and saber."

Another observer noted that "As he leaped a stream, both horse and rider moved as one, and the only visible movement in the rider was the settling of Ashby's cape as he landed on the other side."

Not long after forming the regiment, McDonald's age and ill health made him turn command over to Ashby as lieutenant colonel.

In November 1861, Jackson, hero of the First Battle of Bull Run, assumed command of the Army of the Shenandoah. He mustered about 4,000 men, 600 of whom were Ashby's cavalrymen. Almost immediately, Jackson and Ashby were at odds with each other.

"Jackson was a stern disciplinarian; Ashby was at the other end of the scale, believing that personal example and leadership made up for any lack of drill and discipline."

Jackson was a stern disciplinarian; Ashby was at the other end of the scale, believing that personal example and leadership made up for any lack of drill and discipline. But Jackson's cavalry consisted of troops under the command of J.E.B. Stuart as well as those under Ashby. Together, Ashby and Stuart kept a screen flung wide around Jackson's positions at Harpers Ferry. Their mission was to give Jackson warning of any Federal movement in his direction.

Soon, Jackson tried to unify command of all his cavalry under Stuart, but Ashby refused to be subordinate to Stuart and threatened to resign his commission. Jackson, realizing the effect of Ashby's resignation on the morale of the cavalry, backed down. His position now secure, Ashby responded to Jackson's orders to gather as much information as possible about the Federal positions across the Potomac. On one occasion, he borrowed a homespun suit and a swaybacked horse and, passing himself off as a country veterinarian, moved freely through the Union camps, treating their animals and gathering valuable information.

Federal forces finally made their move, crossing the Potomac in late February 1861 and moving south to protect the railroad and canal from further harassment. Countermoves by other Confederate forces in the area left Jackson in an exposed position at Winchester. He began an orderly withdrawal from Winchester in the face of 23,000 men under the command of Union General Nathaniel Banks. Ashby screened the rear of the army. Another 11,000 men under General Shields joined Banks, bringing the Union strength to a total of 40,000 men.

As the first elements of the Union forces entered Winchester, they saw Ashby, sitting on his white Arabian in the middle of the Loudon Street. He was the last to leave town, making certain his soldiers had reached the safety of the Confederate lines. According to one story, two blue riders rode around through side streets to cut him off. Ashby either did not see the maneuver or chose to ignore it because he sat there calmly until the last possible moment.

An eyewitness described what happened next. "Here was an opportunity to vent his spleen; and charging the two mounted men, he was soon upon them. One fell with a bullet through his breast; and coming opposite the other, Ashby seized him by the throat, dragged him from his saddle, and putting spur to his horse, bore him off."

Jackson moved south, with Ashby screening his rear. Ashby's mission was now two-fold: he had to prevent the enemy from striking the main body of Jackson's army, and he had to keep Jackson informed of the enemy situation. Jackson needed to know not only that the enemy was coming, but also the enemy's strength, his direction, and how much time it would take him to get there.

Ashby's men performed their screen with incomparable skill. They knew every country road, every town and village, and had

friends everywhere. It was the intelligence Ashby provided that enabled Jackson to make his organized withdrawal against overwhelming odds, while planning his next move.

The Union army followed Jackson up the valley at a respectful distance as far as Woodstock, then sent cavalry to penetrate Ashby's screen. Unable to do so, or to locate the main Rebel force, the Union cavalry erroneously reported that Jackson had left the valley, and Shields returned to Winchester with his division. Banks began his move to the east on March 20 to reinforce McClellan. Jackson could not allow this to happen. He had orders to keep as many bluecoats tied up in the valley as possible. On March 21, Ashby informed Jackson that the Federals were turning north and he was hot on their heels. The next day Ashby probed the Federal positions near Kernstown and flushed one Union regiment of infantry and some artillery. He told Jackson that the Federal position was weak. Jackson made a 25-mile forced march to arrive in front of the Union position at 1 p.m. on March 23.

For the first and only time, Ashby's intelligence was wrong. It soon became apparent that the entire Federal division was present, not the few battalions that Ashby had thought. The Yankee force was more than twice as strong as Jackson's. A vicious battle followed, forcing the Confederates to retreat and leave the field in Union hands.

Kernstown was a tactical defeat for Jackson – he lost a quarter of his army, but it was an important strategic victory. Banks halted his move eastward, returning to the valley, and Lincoln ordered McDowell to remain at Manassas Junction with his force to protect Washington. Jackson had succeeded in tying down more than 50,000 Union soldiers.

Jackson resumed his movement up the valley after Kernstown, free of any effective Union pursuit. Jackson described Ashby's value to the withdrawal. "I retreated in the direction of Harrisonburg. My rear guard – comprising Ashby's cavalry, Captain Chew's battery, and from time to time other forces, was placed under the direction of Col. Turner Ashby, an officer whose judgement, coolness and courage eminently qualified him for the delicate and important trust." Jackson was not the only one who knew where Ashby was. A Yankee soldier wrote, "It seems that the enterprising and clever Ashby, with his two light pieces of artillery, was amusing himself.... He is light, active, skillful, and we are tormented by him like a bull with a gadfly....Vacillation is our name. We cannot take Jackson.... My admiration and sympathy go with the gallant Ashby, and the indefatigable and resolute Jackson."

At the end of March, Jackson withdrew through Harrisonburg to Conrad's Store. Banks again followed at a cautious distance. During one six-day period, 19,000 Federals faced 600 gray cavalrymen across a creek. When Lincoln demanded to know what was hold-

ing him up, Banks replied with three words that echoed ominously through the halls of Washington: "Ashby is here."

Banks sat at Woodstock for two weeks, giving Jackson and Ashby a much-needed chance to rest and refit. Tales of life in Ashby's cavalry had spread through the army, and many soldiers left their units and came to join Ashby, drawn by the taste for glory and the absence of drill. This cult of personality swelled his ranks to more than 2,000 men, with only one other field grade officer to help Ashby control them. When in range of Ashby's piercing voice on the battlefield, his men never failed to follow his commands, but at any one time, there might be only about 100 men within earshot.

When there was a lull in the action, many went off to enjoy the hospitality of the local citizens and to reap the fruits of their hero status. Additionally, when a Confederate cavalryman lost his horse, there were no reserve mounts, as in the Union Army. The only solution was to go off in search of another horse. On a given day then, Ashby could count only about half of his assigned strength as present for duty.

Concerned about the lack of control in the cavalry, Jackson attempted to divide the troops between two commanders who would be subordinate to Ashby. This left Ashby commanding in name only, and he again threatened resignation. Other officers interceded in Ashby's behalf, and Jackson cancelled the order.

On April 17, the standdown came to an end. Banks moved to seize New Market. Ashby, across the river, watched the enemy make his move. Jackson's adjutant, Henry Kyd Douglas, witnessed what occured: "I observed the Confederate cavalry return and cross the bridge. I knew the Federals were close at hand. In a few minutes, a heavy dust announced their approach, a regiment of cavalry in blue, with sabers glistening in the sun, came galloping in columns of fours into view, led, apparently, by an officer on a milk-white horse.... It was Ashby. He seemed to be leading the regiment that was after him."

Ashby cut down a Yankee who was upon him, and reached his own lines, but not before a bullet grazed his leg and mortally wounded his horse. Douglas recalled, "The big-hearted Cavalier bent over him, stroked his mane, stooped down, and gazed affectionately into his eyes.... Thus the most splendid horseman I ever knew lost the most beautiful warhorse I ever saw."

Up and down the valley they went, Jackson playing a deadly game of cat and mouse with the Federal forces, while Ashby screened every movement from the eyes of the enemy. They drove the Yankees all the way back to Harpers Ferry and threatened the Federal lines of communication with Washington.

On May 25, however, the lack of discipline among Ashby's horsemen cost Jackson's army an excellent chance to destroy the Union Army. Ashby was on another part of the battlefield in pursuit of some Federal troops when most of his men fell upon the Union supply trains. Tempted by their first spoils of war, Ashby's men stopped to plunder the train, instead of exploiting the tactical situation.

The Union retreat had turned into a rout, and there was no one available to pursue them. "Never was there such a chance for cavalry. Oh that my cavalry was in place," Jackson lamented in his report.

While the Union noose tightened around the Valley Army, Jackson quietly slipped through it. Ashby did such an excellent job of screening the army's movements that for ten days in May, Union commanders had no idea where the Confederates were. Terror took possession of the North. Governors of thirteen states called on their militias to come to the defense of Washington, and Lincoln called for more troops. More importantly, Jackson had struck a massive blow against McClellan's campaign to take Richmond from the Peninsula.

Of Ashby, Cooke wrote, "On every hill, in every valley, at every bridge, he swore to hold his ground or die. He played with death and dared it everywhere." Douglas recalled that on the first day of June, "Ashby called and took supper with us. He was in a placid good humor. He had that day received his appointment as Brigadier General, and it was hoped that as commander of a brigade, he would expose his person less recklessly than he had done while a colonel...."

On June 5, Jackson passed through Harrisonburg and turned east toward Port Republic. He was about to escape once again from the Union forces closing on three sides. Ashby maintained constant contact with the enemy. The next day, Fremont, who had come from the west, closed cautiously on Harrisonburg, and Ashby retired in good order. Skirmishing was continuous, while the Federals probed to find a weakness. One Union captain, captured June 6, confessed that he had saved Ashby's life by deflecting the rifles of three Union sharpshooters. The captain recognized Ashby and

thought Ashby was too brave a man to die that way.

During the afternoon of June 6, the skirmishing grew more fierce, and Ashby sighted Federal troops approaching along a road. Ashby quickly organized all the units in the vicinity and drove the Federals back. Toward dusk, more Federal troops approached in strength. Ashby planned to stop them with a combined force of cavalry and infantry, but the plan failed when the infantry blundered into an ambush and fell apart. Ashby tried to rally the infantry, but his horse was shot from under him. He tried again to rally them on foot, yelling, "Charge, men! For God's sake, charge!" The men responded, and drove the enemy back, with heavy casualties. When the smoke cleared, Ashby lay dead, a bullet through his heart. Only perhaps the death of Jackson could have had a greater impact on the soldiers of the Army of the Shenandoah. James Avirett, chaplain of Ashby's cavalry, remembered the scene that night: "All night long, there was a slow current of sorrowful hearts to this spot.... Each felt that he had lost one who had honored him with his friendship, and affection paid its tribute in scalding tears. His troopers would come in and take their last look at their idolized leader, and then hurry away, while through their sobs might be heard, 'Noble Ashby! Gone!'"

Jackson wrote an order that night to one of his commanders on the margin of a newspaper. As a postscript, he wrote, "Poor Ashby is dead. He fell gloriously... I know you will join with me in mourning the loss of our friend, one of the noblest men and soldiers in the Confederate army." Jackson remained beside Ashby's body for several hours, wanting only to be left alone. In his official action report, Jackson said, "An official report is not an appropriate place for more than a passing notice of the distinguished dead, but the close relations which General Ashby bore to my command...will justify me in saying that as a partisan officer I never knew his superior. His daring was proverbial, his power of endurance almost incredible, his tone of character heroic, and his sagacity almost intuitive in delving the purposes and movements of the enemy."

General Robert E. Lee may have never met Ashby, but in a letter to the secretary of war he wrote, "I grieve at the death of General Ashby." In tribute to his reputation, not only his comrades expressed admiration of Ashby. Even his enemies somehow felt a loss in Ashby's death. Perhaps the most fitting tribute came from the pen of an officer on Fremont's staff, who wrote that Ashby was "The brilliant leader of the enemy cavalry, a man worth to them regiments, a blast upon whose horn was worth a thousand men. When we found the brave Ashby was slain, there was no rejoicing in our camps."

Ashby was only a man, but he became a legend in the valley of the Shenandoah River, the subject of poetry and song. He exhibited the qualities of medieval knighthood in fighting modern war. Through leadership and personal example, he inspired thousands of men to fight valiantly for their beliefs, and contributed to the stories that cavalry life was where the glory lies.

Ashby's personal courage and skill in the Shenandoah Valley Campaign enabled Jackson's army to march 170 miles in fourteen days, rout an army of 12,500 men, threaten the North with invasion, draw McDowell from Fredericksburg, seize hospitals and supply depots at Front Royal, Winchester, and Martinsburg, and, surrounded on three sides by 60,000 men, extricate a huge convoy without losing a single wagon. Two days after Ashby was killed, Jackson slipped from the valley and joined in the defense of Richmond.

"Hear ye that solemn word,
Accent of dread...
Ashby our bravest one!
Ashby is dead!"

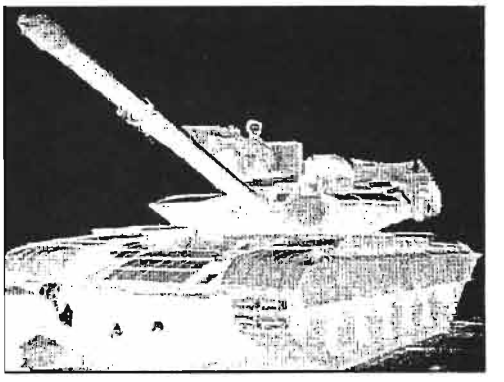
A poem by Jackson's sister-in-law, Mary Preston, contains these lines.

"Hear ye that solemn word,
Accent of dread...
Ashby our bravest one!
Ashby is dead!"

Turner Ashby rests today in Winchester's Stonewall Cemetery in the Valley of the Shenandoah River; amidst the echoes of bugles and the ghosts of his troopers. But he left us a classic study in economy of force, knowledge of the terrain, and ability to see the battlefield that is unsurpassed in value to today's AirLand Battle commander.

Major Patrick J. Cooney was commissioned in Armor from the USMA in 1974. He served in the 1st Training Bde. and 194th Armored Bde. at Fort Knox; commanded HHC, 1st AD; and has served in public affairs assignments in 1st AD and USMA. He is a graduate of AOB, JMOC, AOAC, CGSC, and holds a master's degree in journalism from the University of Kansas. He has been editor-in-chief of ARMOR since June 1987.

Tank Thermal Signatures: The Other Variable In the Gunnery Equation



by Stephen P. Rosa
and Sergeant First Class Thomas Lindsley

Introduction

Recent articles graphically defined the armor/anti-armor question with regard to the vulnerability and lethality of our current and future tank systems. However, as the lethality equation shows:

PK = (PD/T*PA/D*PH/A*PK/H)(1)

PK/H is but part of the process that kills enemy tanks. In fact, it is the last part – the "end game." We must keep the total process in focus: many conditions must be satisfied before the "end game" gets played.

Before a particular steel (or tungsten, or depleted uranium) penetrator punches its way through X inches of RHA, a trained crew had to detect, acquire, and hit that target. This is the realm of tank gunnery, and without a realistic assessment of our tank gunnery skills, we cannot properly solve the armor/anti-armor equation.

What would such an assessment show? There are those who would say things are better than ever – evidence CAT '87, the steadily increasing number of crews posting perfect scores on Table VIII, and the recent designation of the thermal channel as the primary sight.

However, a closer examination shows that these may be misleading indicators, giving us an unjustified sense of security. The fact is, high marksmanship scores alone are not a true measure of unit readiness. Thus, in the context of the direct fire battle with the Soviet Threat, we may have put all our eggs in "the thermal basket." The enemy knows this and is ready to scramble them for us.

The Problem

The U.S. Army and its principal NATO allies have invested heavily in thermal imaging systems. Virtually every first line MBT and ATGM system in NATO incorporates an 8-14 micron (m) imager of some kind in its Fire Control System (FCS). This is a justifiable investment in a technology with obvious force multiplier potential.

Thermal imaging is not without its limitations, and unfortunately, neither the laws of physics nor of human nature have been repealed. Our emphasis on the "thermal," and the way we are currently training to exploit it, are putting our armored force in a precarious position.

Specifically, the Soviets are well aware of our reliance on thermal imaging and are developing thermal countermeasures and doctrine to defeat it. There is also strong evidence the Soviets have made significant progress in reducing the thermal signatures of their vehicles. Yet, for reasons characteristic of a peacetime Army, our gunnery targets are going the other way. While specific details in some areas remain classified (more on that, later), it is fair to say that what we are training for is not, repeat not, what the enemy will show us in battle.

Target Signatures

The operative phrase today is: "We will train the way we will fight!" If the axiom is correct, then there is no more perfect example of a mismatch between peace and war than in thermal gunnery. While thermal target signatures are hot and getting hotter, the Soviets are investing heavily to reduce the thermal signatures of their vehicles, especially across the frontal arc (the view they will try hardest to present).

Current training device specifications call for a thermal target to present, "a *realistic* designation of a threat thermal image by heating to a *minimum of five (5) degrees Fahrenheit above ambient* temperature and maintain[ing] this temperature until the target is lowered." (Emphasis added). This may have been satisfactory for the T-54/55/62 series of vehicles, but it is unacceptable today.

The last unclassified information on the T-72 thermal signature released by the Army Night Vision & Electro-Optical Laboratory indicates the "delta T," as it is known, across the frontal arc is only 2.0°C

(3.8°F). Since the T-72 is a relatively old vehicle technologically, as compared to the T-80 and FST-2, we can only presume the Soviet vehicle signature reduction effort has progressed since the T-72, putting our training program further out of touch with reality.

Figure 1 is an attempt to graphically portray the problem.

There are members of the training community aware of and concerned about this problem. They need our support, because in order to put more realistic (read, cooler) target signatures on our training ranges, we will have to overcome the obvious correlation that hotter targets are more detectable targets, and more detectable targets produce better gunnery scores on Tables VIII and XII.

Some may counter that these "hot" target signatures do portray the Threat, especially one making an attack on our positions. They would argue that the Soviets prefer predawn or early morning attacks, when target-to-background contrasts should be greatest. After all, the enemy will have driven some distance to the attack, so all the mobility cues (tracks, road wheels, exhausts, etc.) should be hot.

Such statements are not fully supported by the NV&EOL Infrared Recognition and Target Handbook, especially when targets are viewed at detection and engagement ranges (1,600 meters plus). These statements do not take into account the thermal character of composite armors, and they fail to address weather effects, atmospheric attenuation, and the diurnal cycle.

In addition, our gunners cannot count on seeing full frontal views of attacking enemy tanks. Terrain features, foliage and mud or dirt caking on the tracks and road wheels will mark these mobility cues to some extent (see photo below).

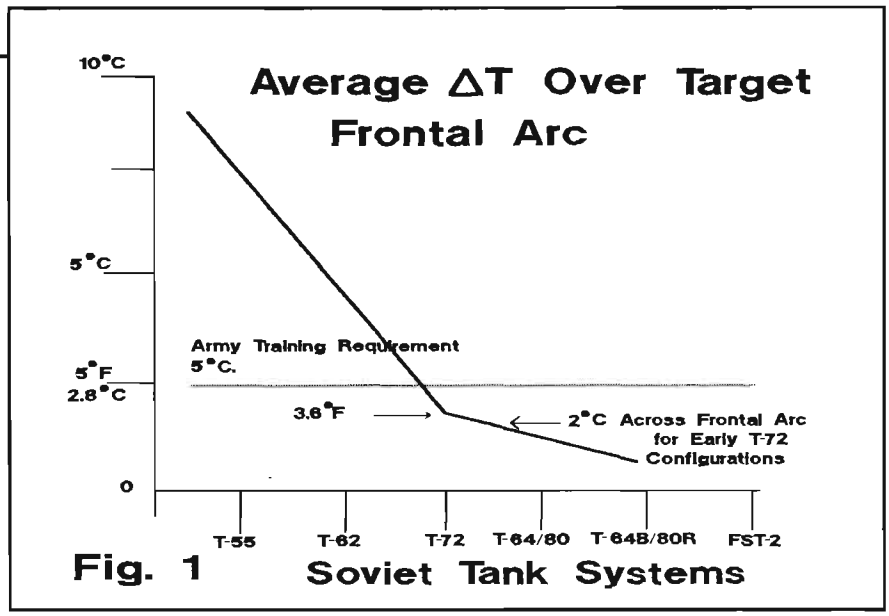


Fig. 1

Even if the mobility "cues" were as advertised, there is no justification for inferring the vehicle is similarly hot across its entire frontal arc. Yet that is exactly how the thermal targets operate. But are we conducting a thermal gunnery program designed to counter one scenario — Soviet attacks at dawn? What about III Corps? The III ("Mobile") Corps' mission is to attack to restore the situation and regain the operational initiative. Now the enemy is on the defensive, in hastily prepared positions or worse. What is the thermal signature of a dug-in T-80?

The technology to provide more realistic targets exists. The standards for such realistic signatures also exist, believe it or not, in the classified (the "C" word) thermal countermeasures requirements for new ATGM systems. It is inconceivable that the standard imposed on testing these ATGM systems should be more stringent than that for train-

Obscured running gear will reduce Soviet tank thermal signatures.

ing the crews of our primary anti-armor system, the M1A1, yet that is exactly where we are today.

Thermal Countermeasures

There is a phrase for the target signatures portrayed on our live fire ranges — "Parade Ground Imagery!" This is due to the fact that the Threat vehicles portrayed in the Army Target Catalog are full scale, clean, and unencumbered by any of the intentional/field expedient thermal countermeasures known now to be part of the Soviet bag of tricks.

Yet one need only view the first seconds of the USAREUR DCSINT video on Soviet armor to see a T-72 camouflaged to the hilt, on the attack. The natural grass matting strapped all over the vehicle reduces its visual, thermal, and radar signatures, as the classified results from the Joint Army/Air Force Top Attack Smart Munitions tests ("Chicken Little") clearly indicate. Again, the Soviets know this. There have been numerous photos in the Soviet/WP open literature showing the enemy's increasing use of such camouflage techniques (see photo at right). The intent is to obscure the signature of the vehicle without impeding its mobility. They appear to have succeeded.

Obscurants also must be considered. Rumors persist that the Soviets have developed an effective thermal defeating smoke. The particulars on its delivery and capabilities are classified, but one can review the open Western literature and see similar multi-spectral obscurant smokes advertised. The Soviets are true believers in the use of smoke, and a thermal obscurant system would be a natural addition to their inventory. Such a smoke would block the transmission of a thermal signature by throwing up clouds of heated particulates. It would degrade the use of thermal imagers by either side, which would suit the Soviets just fine, since we will be the disproportionately bigger loser.

An additional thermal attenuating obscurant will be the dust and particles thrown up by Soviet artillery fires. Estimates indicate that the preparatory fires by 152-mm SPAs firing HE will create an obscurant cloud so dense it will effectively block all visual and thermal signature detection. This is true even for what one might consider as the moist German soils, any time of the year.

A Soviet light armored vehicle dug in and heavily camouflaged

Tactics and Training

As noted earlier, the Soviet leadership is well aware of NATO's investment in thermal imaging. It appears they see this reliance on thermal as a potential dependence that they can exploit. To this end, they are training their assault engineers and tank crews to use field expedient thermal countermeasures against NATO forces. TACOM has documented the potential of such actions, and the USAREUR DCS INT video alludes to the fact that the Soviets are employing them. One such countermeasure of particular note is the setting of fires all over the battlefield. These fires create "hot spots" which, at best, act to obscure actual targets (by raising the background "noise" level and causing our imager detectors to go into saturation) and, at worst, may draw our fire. Another tactic is the rediscovery of the use of terrain as a method for reducing vehicle detectability. Army/DIA photos taken in April 1988 of a modernized GSFG armor unit show 2S1 122-mm SPGs in dug-in overwatch positions. Other recently declassified photos show GSFG T-80s dug in during a major exercise. Clearly, this use of terrain is primarily to reduce a vehicle's vulnerability. The Soviets have always been good at that. But there can be no question that by hiding major "cues," such as tracks, engines, exhausts, etc., the Soviets have also reduced the detectability of their vehicles. Again, this may have a disproportionate impact on III Corps.

Summary

Any one of these factors -- signature reduction, thermal counter-

measures obscurants, tactics/training – will reduce the effectiveness of our thermal imagers. But the Soviets believe in redundancy, and we must anticipate that the Threat will use everything at its disposal to negate NATO's thermal imaging capabilities. The combination of all these factors will be devastating. But none of them are currently factored into our thermal gunnery training. *In fact, we are doing worse than ignoring them, we are conducting negative training. Table VIII is as clean as the driven snow, and Table XII is but a Table VIII with three friends!*

To gauge the full implications of these facts, we need only paraphrase our initial guidance to: "We will fight the way we train!" We are not training today to meet today's Threat, let alone tomorrow's.

What can be done to remedy the situation? Certainly the technology exists to make more realistic targets, simulate Soviet thermal countermeasures and obscurants, and modify ranges to reflect real world tactical conditions. The Armor soldier has the skills and human cognition to meet the challenge. The information regarding the magnitude of the problem (i.e., Threat signatures, thermal obscurant smokes, etc.) exists, albeit in classified form.

The question is, are we prepared to release that information to the armor force in a form they can use effectively? Are we prepared to bite the bullet on tougher thermal gunnery training?

The purpose here is not to promote one solution or another. The objective initially is to raise the level of debate on this issue to bring out all the options.

It will take discipline and commitment from all concerned to accept the fact that artificially high gunnery scores do not reflect true preparedness. The Soviets are counting on us not to meet the test.

Use of foliage can affect both the target's visual and thermal cues.

Notes

[1]Components of the Lethality Equation, as presented in GAO Report GAO/PEMD-87-22 "Anti-Tank Weapons: Current and Future Capabilities," are as follows:

PKill = Probability of kill, given the following:

PD/T = Probability of detecting a target, given a target is present

PP/D = Probability of acquiring that target, given a detection

PH/A = Probability of hitting the target, given it has been acquired

PK/H = Probability of a kill, given a hit

[2]See PM TRADE "Specification for Interim Armor Integrated Thermal Signature Target (IATST)" #EC-RI-10A, dated 20 July 1988.

[3]See NV&EOL "Infrared Recognition and Target Handbook," (FOUO), 1982, Sections 2.3 and 2.5, in particular.

[4]See "An Important Element of Tactics," an article by Soviet Lt. General L. Generalov, First Deputy Commander of the Transcaucasus Military District, in the May 1986 issue of "Voyennyy Vestnik."

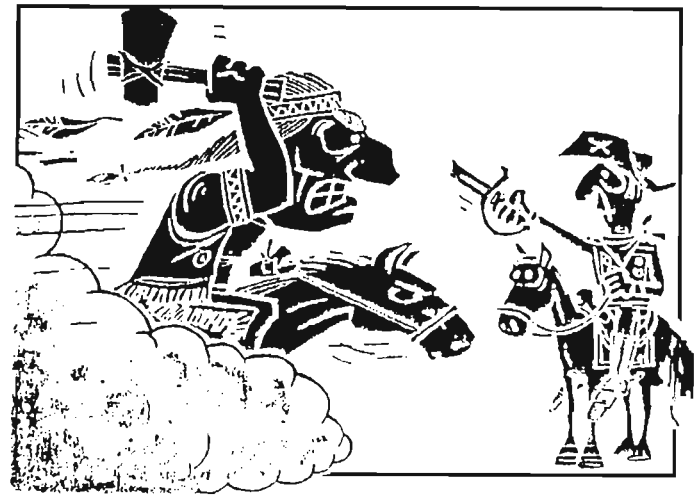
[5]Numerous photos of interest showing Soviet/WP vehicles on field maneuvers appear in 'SOLDAT' Magazine. The pictures of the camouflaged BMP and T-72, as well as others, appeared in this newspaper/magazine.

[6]For more information on Soviet Thermal Countermeasures, see "In the Interest of Stable Defense: The Theory and Practice of a Combined Arms Battle," Soviet Military Review, March, 1989.

Stephen P. Rosa is Vice President, Special Products, TVI Corporation, in Beltsville, Md. He holds an engineering degree from Columbia University and a master's in business administration from Harvard. He has over 12 years experience analyzing and simulating Threat thermal signatures. He invented the Army's Interim Standard Thermal Target System and the M1A1 Multi-Spectral Close Combat Decoy.

Sergeant First Class Thomas Lindsley has served as troop master gunner, C Troop, 1-10 Cav, platoon sergeant and battalion master gunner, 3-66th Armor, at Fort Hood, and master gunner, 7th Army Training Command. He is currently assigned as a platoon sergeant with the OPFOR at the NTC.

Division Cavalry: The Broken Sabre



by Major General Robert E. Wagner

Author's Preface:

This article is from a presentation I delivered at the Armor Conference over four years ago. I realize that initiatives have been implemented to correct some of the problems, and that others may have been overcome by events. However, the central issue remains. In spite of the strong leadership and efforts of the Armor community, the divisional cavalry squadron remains a seriously flawed combat organization. Once again, we in the Armor community should revisit this issue. The "Broken Sabre" must be reforged.

All of us love to talk about cavalry. Cavalry is important because this institution represents the fount of Armor tradition. It is also a complex and controversial subject, and there are as many views on cavalry as there are members of the Armor Branch. I certainly am not going to solve cavalry problems during this pitch, but I hope some juices start flowing.

Let me start with an old cavalry story. As many of you know, I am a former commander of the 2d Armored Cavalry Regiment, our oldest regiment on continuous active duty.

The Dragoons were formed up in 1836 for the purpose of fighting the Seminole Indians in the Florida Everglades. Naturally, they were equipped with fine horses to accomplish this mission. On their first foray into that hostile land, most of those fine beasts were either devoured by alligators, bitten by rattlesnakes, or drowned in swamp holes. A few were even killed by the enemy. This tragic event immediately caused a relook at the regiment's training and its basic 'vehicle.' The operative question was: "Were these dragoons organized to fight Indians in the swamps?" I submit that this question remains with us today and has confounded the finest minds in our Army. We experience incredible difficulty in coming to grips with the arm that embodies our mounted tradition. This is a serious problem because our AirLand Battle doctrine envisions fighting and winning outnumbered. And fighting and winning outnumbered ain't for sissies! Reconnaissance, security, and, most important, economy of force, executed by gallant troopers and facilitated by sound organization, doctrine, and a battle-linked training discipline are absolute requirements to accomplish our battle objective. A paragraph from the preface of FM 17-95 *Cavalry,* says:

Cavalry organization and use exemplify two essential criteria of battle. The first is the need to find the enemy and develop the situation with the least force possible. The second is the need to provide reaction time and maneuver space with a force tailored to leave the largest possible residual of combat power in the main body available for use at the time and place of decision. These criteria are based on the principle of war — Economy of Force. Cavalry is an economy of force.

You can see that when we change or tamper with cavalry, we do so at great peril. These alterations, if not sound, can jeopardize the Army's fundamental mission of winning the land battle. Or, to put it crudely, when you are fighting a larger guy, you better get your cavalry out to know what he is up to. Not to do so would be analogous to fighting a thermal-equipped Mohammed Ali, at his best, in a darkened ring.

Let's take a look at some of the fundamental changes in the armored cavalry platoon over the last 15 years. Figure 1 shows the Baseline Platoon of 1970-1973. In Figure 2, we see that the platoon of 1973-1975 organized a scout section of four M551s and dropped the M114s. In 1975-1978, the "3 for 5" platoon was modified; now the platoon lost its rifle squad and mortar squad and had reorganized its scout section from M551s to M113s (see Figure 3). In the period 1978 through 1980, the platoon lost its M551s and replaced them with four

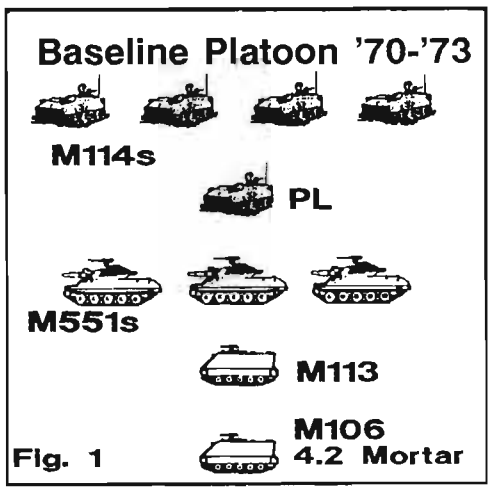


Fig. 1

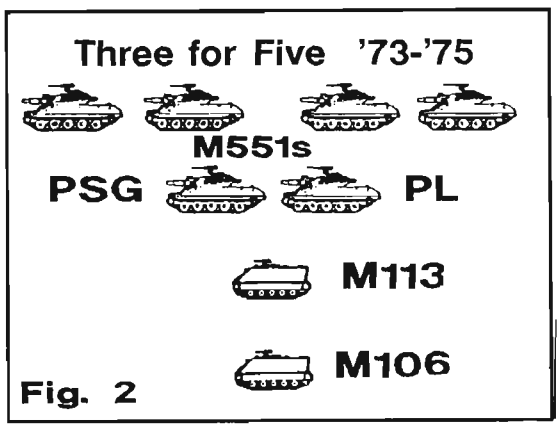


Fig. 2

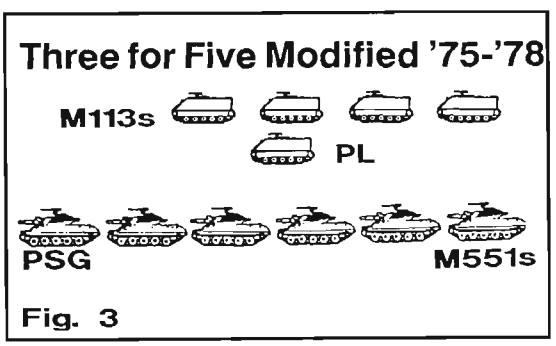


Fig. 3

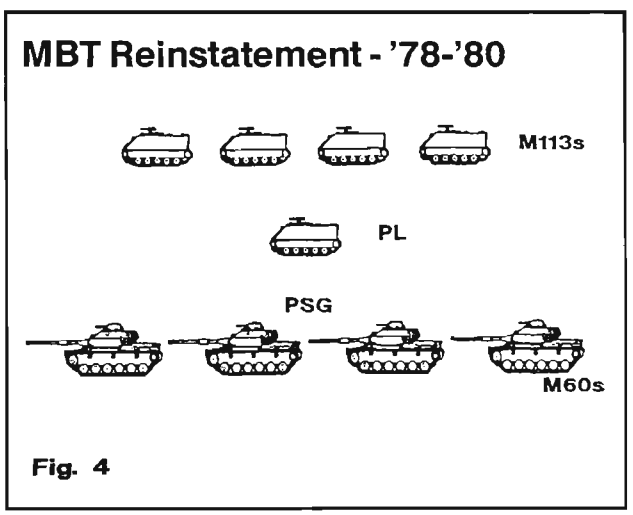


Fig. 4

Main Battle Tanks (see Figure 4). Figure 5 shows what the J-series platoon looks like now; the MBTs have been eliminated and the platoon consists of six Bradleys.

All I can say is, *Wow!*

In light of these cataclysmic force structure changes, the operative question becomes: "Have we broken the sabre?"

I don't believe we have totally shattered the blade. The regimental organization remains sound, though there are some problems such as tank/scout integration at platoon level, and the lack of transportation for key personnel. I believe, however, that we have broken the sabre of division cavalry.

Let me say at the outset that I am going to overstate my case on division cavalry. Some of my solutions will be labeled as simplistic. My perspective, however, is that of a commander and operator, not that of a force design expert.

We are going to look at some division battle scenarios where cavalry plays a key role. These scenarios have a heavy division and European slant, because that environment remains vital to our security.

First, let's look at the backdrop for these scenarios: They reflect a maneuver, nonlinear form of warfare we term AirLand Battle – not a linear, attrition battle. I will describe this concept in a few moments. The cavalry regiment is employed elsewhere in these scenarios and is not available for division-level operations. An argument has been made, incidentally, to justify the emasculation of the division cavalry because the regiment would be available for division cavalry missions. For us European warriors, this argument is not sound. The cavalry regiment ain't available to the division commander! In fact, combat resources usually go in the other direction.

Another argument which supported the weak squadron is that the 20,000-man heavy division could afford to augment the squadron with heavy forces when necessary. This is now difficult because the forward brigades have been thinned out under the Army of Excellence force structure changes.

The AirLand Battle is the centerpiece for these scenarios. The concept is designed to fight the total battle with the synchronized execution of the deep battle, the near fight, and the rear area battle. It is aimed at destroying a numerically superior enemy through the in-depth structuring of the battlefield with fires, obstacles, and maneuver.

Forces are structured to withstand the initial concussion of attack, shape the enemy into a configuration of vulnerability, and then

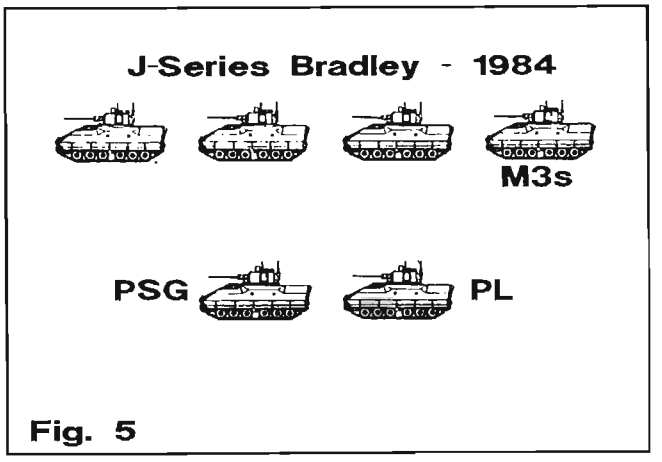


Fig. 5

recover quickly to conduct offensive operations against vulnerable areas to destroy him. This battle places a premium on detailed terrain analysis, cavalry operations such as covering force and economy of force missions, which allow us time and space to mass in the face of overwhelming numerical superiority, barrier plans synchronized with the concept of operations, and maneuver. Maneuver, of course, is the keystone to AirLand Battle doctrine. It provides the operational catalyst which swings the initiative to our side. Here is how this looks conceptually. (See Figure 6).

● **Cavalry Covering Force.** The division cavalry squadron deployed initially well forward in the battle area. Cavalry conducts covering force operations, which allows the division the space and the time to economize its forces and mass in the face of numerical superiority.

● **Bradley-Heavy Forces.** Deployed initially forward in the battle area behind the cavalry. These forces, in conjunction with the cavalry, find the enemy, shape him into a configuration of vulnerabilty, and then fix him at designated attack positions. This produces a compression effect on the enemy's attacking formations, which results in a lucrative attack target for the Abrams forces.

● **Abrams-Heavy Forces.** Deployed initially in depth against the possibility of a quick breaking attack, but oriented primarily toward subsequent offensive operations when the Bradley and cavalry forces have shaped the enemy into a vulnerable target complex.

● **Pro-active Counterattacks. (Traps).** These operations are planned, anticipated operations which are executed on a battlefield that has been carefully structured to ensure destruction of the enemy through offensive action. They are not simply a reaction to enemy breakthrough. In fact, the battle is conducted deliberately to focus these offensive operations against the enemy's vulnerable areas.

Again, the battle construct provides a backdrop for the division scenarios I will now describe.

Covering Force

(see Figure 7).

● **Concept.** AirLand Battle structure as described.

● **Disposition.** Division cavalry squadron is deployed forward as covering force.

● **Function.** Early warning, interdiction, develop the situation, attrit the enemy and allow the division the space and the time to economize its forces and mass at the critical tactical point of decision in the face of numerical superiority,

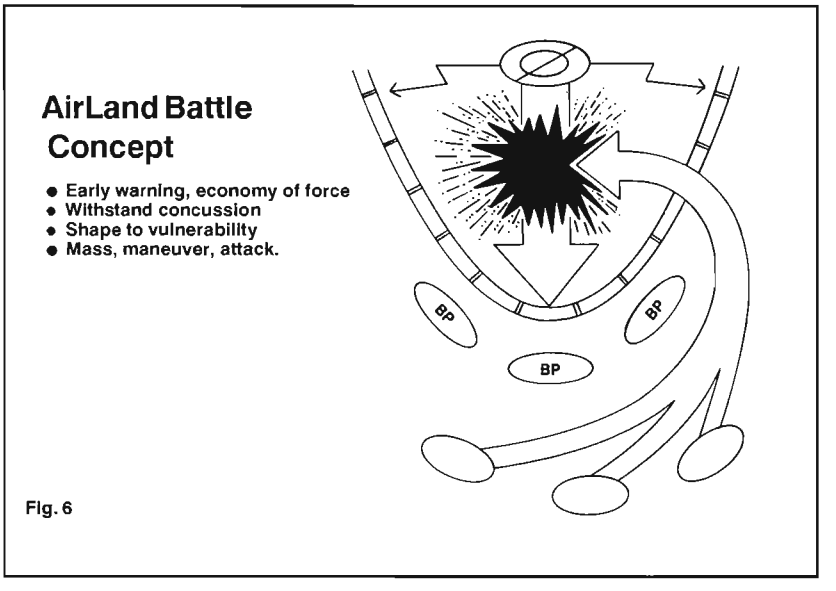


Fig. 6

an absolute essential to success in AirLand Battle.

● Force structure requirements. The division cavalry squadron in this situation requires three ground troops because of the width of the sector, a heavy combat capability at troop level to fight enemy armor, and air cavalry. The AOE organization is deficient in these areas.

Deep Attack
(see Figure 8).

● **Concept.** AirLand Battle structure as described.

● **Disposition.** Division cavalry squadron leads pro-active counterattack.

● **Function.** Division cavalry squadron rapidly leads attacking brigade through terrain, obstacles, and battlefield debris. This allows the attacking brigade to maintain offensive momentum, a must in AirLand Battle if we are to operate within the enemy's decision cycle.

● **Force structure requirements.** The division cavalry squadron in this situation requires three ground troops to provide offensive depth, a heavy combat capability at troop level to fight enemy tanks, and air cavalry. The AOE organization does not fit the bill in this situation either.

Economy of Force
(see Figure 9)

● **Concept.** AirLand Battle structure as described.

● **Disposition.** Division cavalry squadron occupies economy of force sector.

● **Function.** Division cavalry squadron defends economy of force sector, which allows armored

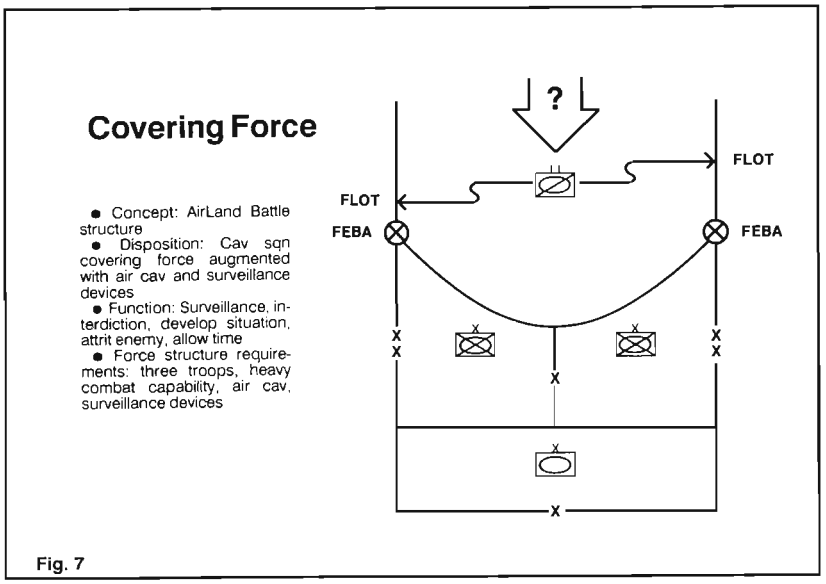


Fig. 7

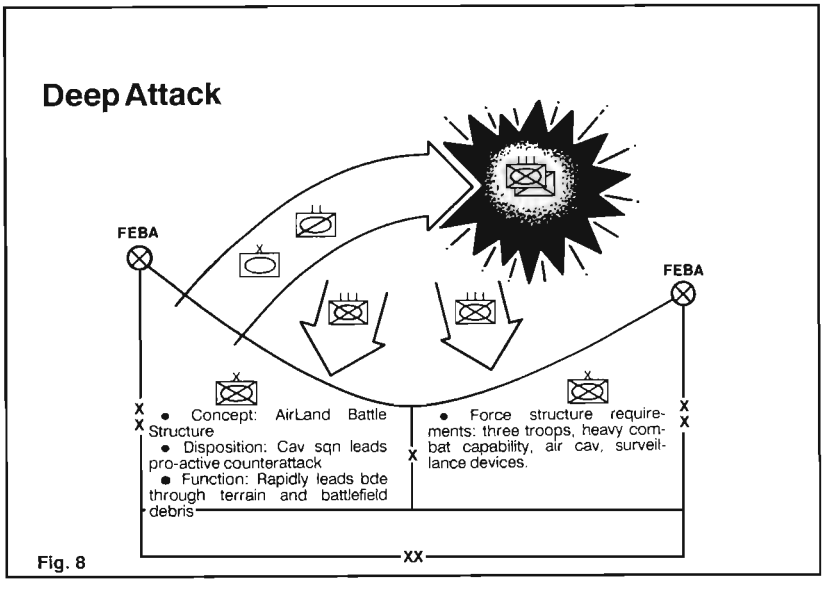


Fig. 8

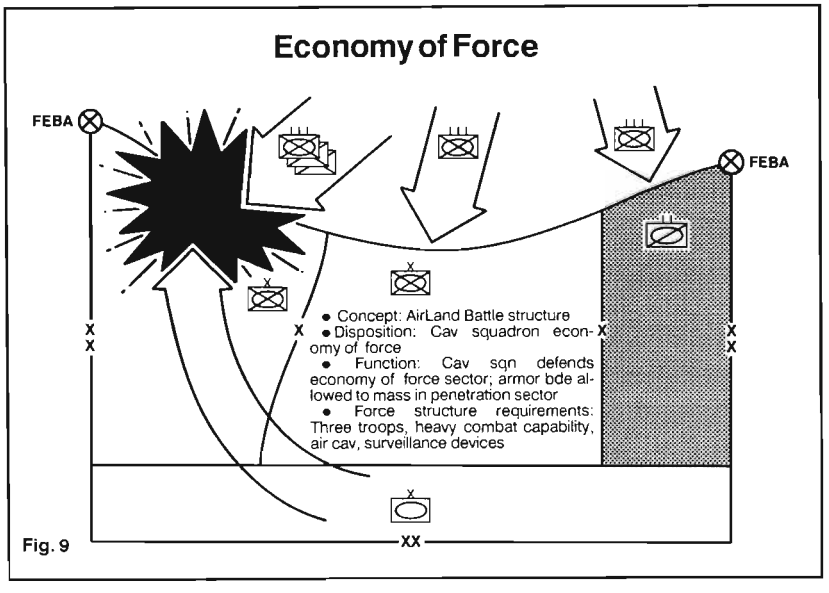


Fig. 9

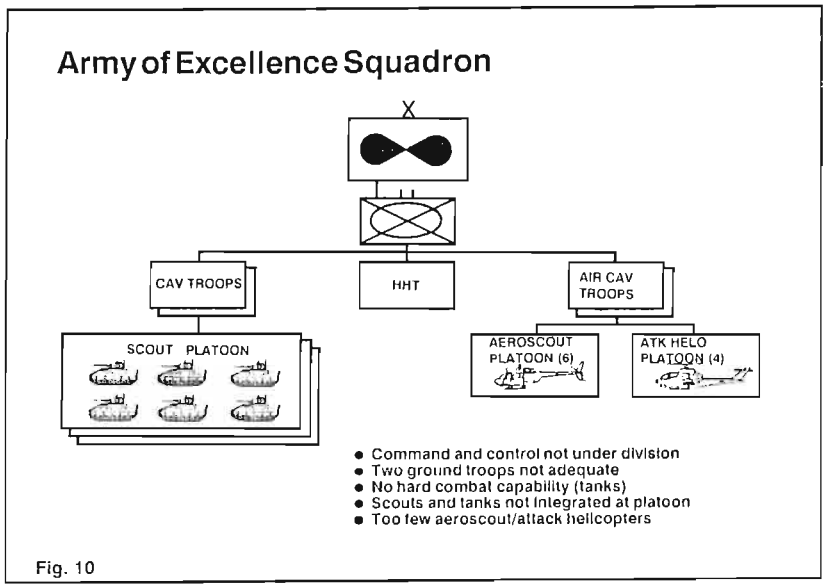


Fig. 10

brigade to mass in penetration sector. Without this economy of force function, which allows the division to mass its forces at the tactical point of decision in the face of numerical superiority, AirLand Battle will not work.

• **Force structure requirements.** In this situation the division cavalry squadron requires three troops because of the width of sectors, a heavy combat capability to fight enemy tanks, and air cavalry. The AOE organization does not possess these capabilities.

Now let's look at some of the faults in the current 2x2 cavalry squadron. Consider the battle scenarios that we have just discussed as backdrops for analyzing this organization.

As we look at this organization and consider our doctrine and the battle scenarios, the problems become obvious. (See Figure 10.)

In terms of *command and control,* the division cavalry squadron should be under division control, not under the control of the combat aviation brigade. It has been a hard-learned lession that "we will fight as we have trained;" therefore, we must ensure that the squadron trains under the control of the headquarters under which it will fight.

We also need to change the *squadron structure.* We need a third ground troop in order for the squadron to be able to cover three avenues of approach and provide basic combat configuration for in-depth squadron formations for fighting reconnaissance missions. The initial Division 86 structure changes include brigade scout platoons, squadron sensor platoons, and troop motorcycle platoons. These forces supposedly offset the need for a third ground troop. However, these elements have been eliminated both from the brigade and the 2x2 squadron organization.

The squadron needs tanks for *hard combat capability.* Deep attack, covering force, economy of force operations, and even pure reconnaissance require armor. *Ad hoc* augmentation will not work because of the teamwork required in cavalry organizations and operations.

At the level of the cavalry platoon, the scouts and tanks are not integrated. That integration is essential for teamwork.

There are too few scout/attack *helicopters.* A 6/4 mix is just not adequate to do the combat tasks that this troop may well have to perform.

To exacerbate this gloomy situation, we are sending one troop from the FORSCOM division cavalry squadrons to the reserve components or to forward deployed brigades. The assumption is that the division commander will somehow be able to reconstitute these assets after deployment through osmosis and fight them effectively.

Can we retemper the steel of the division cavalry squadron? I am a neophyte when it comes to the mysteries of force design, personnel ceilings, cost, expense, and things like that. In spite of my lack of experience, I have designed a "super squadron" that will do the job: the 3x1 organization. Perhaps it is easy and naive to solve problems like this out of blissful ignorance of the big constraining picture, but I believe we should always view combat arms force structure in a battle environment context to avoid the creation of organizations that are not in synch with our battle doctrine.

This 3x1 organization (See Figure 11) solves the deficiencies discussed in the 2x2 formation. The command and control of the squadron is at division level, both for training and combat. There are three ground troops to cover three ground avenues of approach. The squadron has a hard combat capability built into integrated platoons, and there

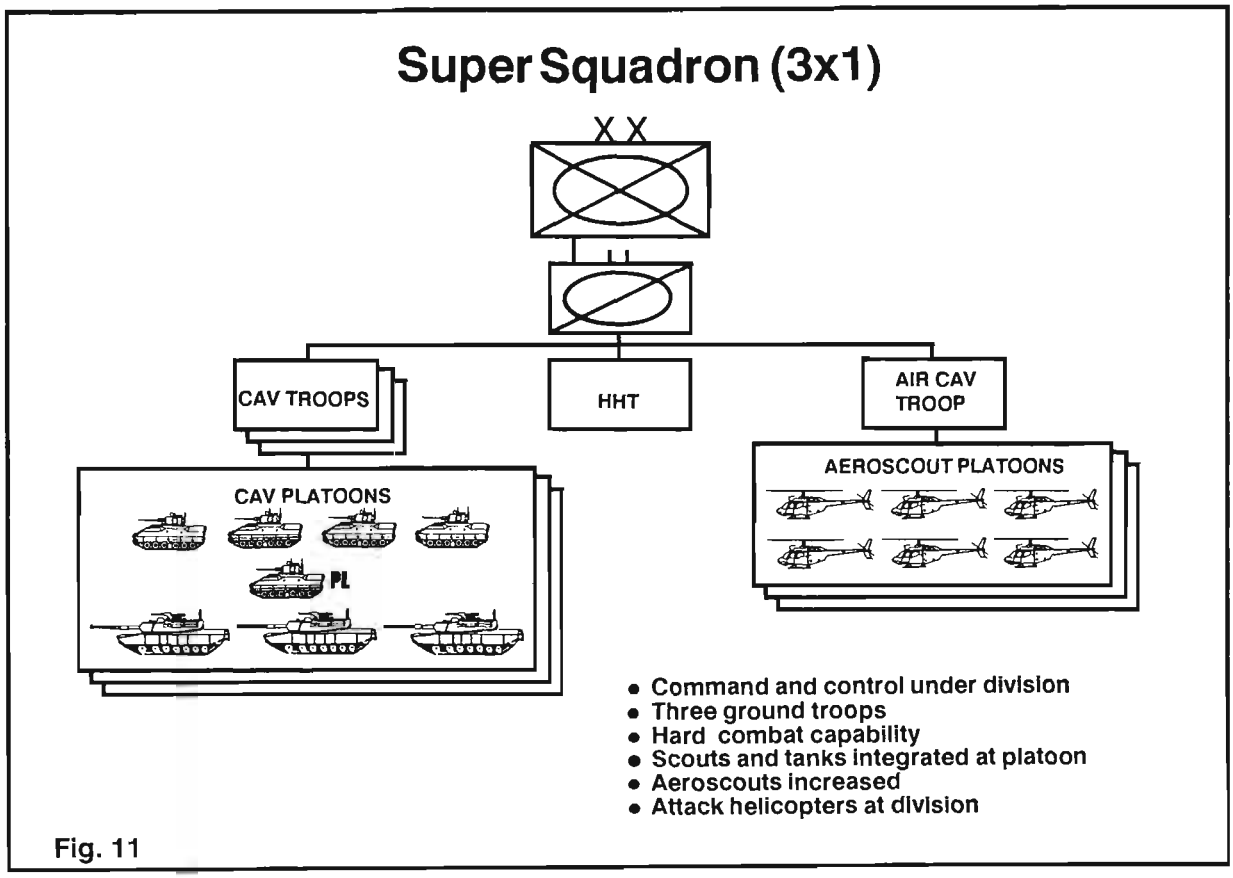


Fig. 11

are adequate aeroscout elements for reconnaissance.

In force design, there is always a problem of spaces. These spaces are available in our Army force structure because of anomalies in the mechanized infantry battalion organization. The Bradley battalion does not need the antitank company because of the Bradley's characteristics (i.e., TOWs on each Bradley in the mechanized rifle companies). Nor is the mechanized battalion's scout platoon an operational necessity because of similar systems in the battalion organization. These numbers more than close the space gap and apply the correct bill-payer philosophy to flesh out the division cavalry squadron.

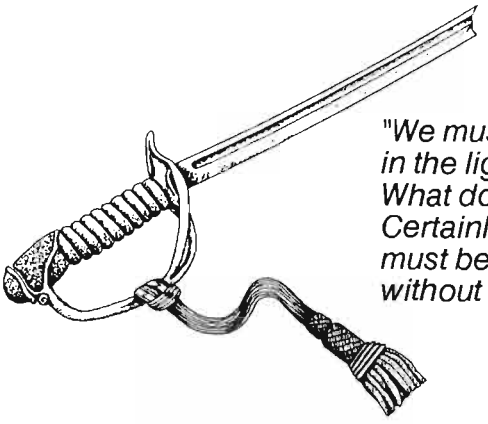
The Super Squadron makes a statement to us all: In a high intensity environment, the heavy division demands a large, tough, robust fighting outfit. When the bullets are flying in an outnumbered battle, there will never be enough cavalry to go around. This force habitually will receive the tough missions to make AirLand Battle work. Therefore, let us not emasculate the division cavalry squadron.

A rebuttal to this statement could be: "We can reinforce the squadron for the contingencies you described when necessary; don't touch the 2x2 organization because it saves spaces and is cheap."

My reply is: "These scenarios are not contingencies. They represent habitual missions. *Why reinforce an organization which will always require reinforcements?*" Change the organization; make these "reinforcements" organic parts of the cavalry fighting team. Only a balanced, organic cavalry team with the right mixture of scout vehicles, tanks, indirect fire weapons, and aviation can produce the lightning-type tactical execution which must be the hallmark of cavalry operations. This execution is a result of teamwork, of cavalry *èlan* and *panache* operating against strong odds as a team for their country, cavalry colors, and honor. And country, colors, and honor are not things to be trifled with in a fighting organization. *Ad hoc,* thrown-together, organizations do not perform this way and could confound our efforts to win on the outnumbered battlefield.

Perhaps my solution is too simplistic. Again, the division cavalry problem cannot be solved here, but I hope I have made the point that the division cavalry squadron sabre is broken. As mounted warriors, all of us know that this organization must work to make AirLand Battle an operational reality. The haphazard force structure patterns of the past must stop. Let me offer some recommendations.

We need to establish a Cavalry Needs and Initiatives Committee with strong clout to direct the fu-



"We must re-examine cavalry doctrine in the light of AirLand Battle. What do we want cavalry to do? Certainly, the division cavalry squadron must be capable of executing economy of force missions without dependence on non-organic resources."

ture development in this arm. I am not sure there is a clearing house at the Armor Center to determine the future azimuth of cavalry. The committee would examine regimental cavalry and division cavalry for both light and heavy divisions. As a first step, the committee must take a hard look at the division cavalry squadron and fix it. The committee should address several areas:

Doctrine. We must re-examine cavalry doctrine in the light of AirLand Battle. What do we want cavalry to do? Certainly, the division cavalry squadron must be capable of executing economy of force missions without dependence on non-organic resources.

Force Design. We need to design a division cavalry squadron that will get the job done – not on an *ad hoc* basis – but with organic means.

Cavalryman Selection. We need to implement a special selection process for cavalrymen, which, among other things, does not accept Category IV soldiers. *The infantry has its elite Ranger battalions, and we must have our elite Cavalry squadrons.*

Individual Training. We need to design a cavalry track training program that is synchronized to cavalry's operational functions, systems, and force structure.

Collective Training. We need to establish a "training-is-the-battle-link" program, which links the cavalry ARTEP to combat. Training is the professional link between peacetime activity and combat operations, and that link must be highly visible and strongly forged.

Materiel. We need to start development on a future cavalry vehicle. The M3 can be improved, and at some future point we will need an entirely new mount.

Technology. We need to apply high technology sensor development to augment cavalry operations.

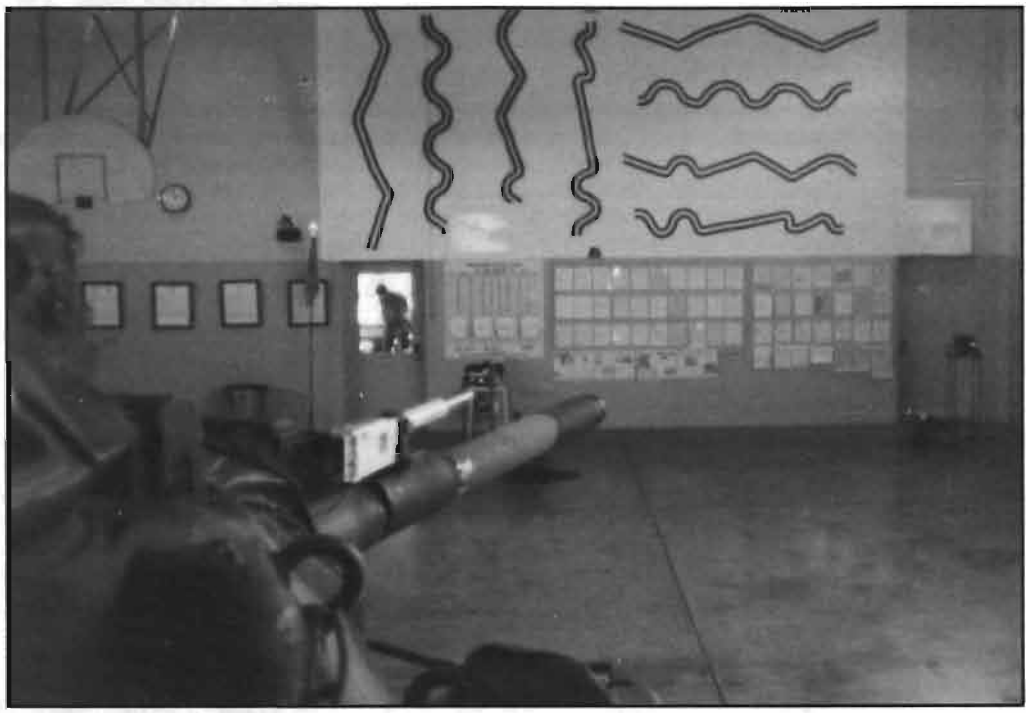
Logistics. We need to design a system for squadron support from the division DISCOM.

This list could go on and on. These are only some of the key areas that a Cavalry Needs and Initiatives Committee must review.

The bottom line is that we must go back to the operative question asked 150 years ago: "Have we organized the 2d Dragoons to fight Indians in the Florida Everglades?" Or, in a more modern vernacular, is Division Cavalry an effective fighting member of the AirLand Battle team?

The success of our battle doctrine demands a correct answer from you – the Armor Community.

Major General Robert E. Wagner has commanded a tank battalion, a division cavalry squadron, and a cavalry regiment. He served as assistant division commander for maneuver of the 3d Infantry Division when that division transitioned to the M1 tank. In Vietnam, he was subsector advisor in IV Corps during 1966-67, and province senior advisor in I Corps from 1970-1972. Prior to his Vietnam service, he was an exchange officer to the British Army of the Rhine, commanding a squadron of the 13/18 Royal Hussars. General Wagner is currently the first commanding general of ROTC Cadet Command, based at Fort Monroe, Va.



Armory Training for Tank Gunnery

by Lieutenant Colonel Gerald R. Whitfield and Major Douglas L. Dilday

A common concern for National Guard Armor units is how to train and maintain gunnery proficiency, given only 39 days a year, plus the requirement to execute other "good ideas" that are designed to improve readiness. The 1st Battalion, 632d Armor of the 32d Separate Infantry Brigade (M), Wisconsin National Guard, has developed a way to skin the cat.

All line armories in the battalion are located three to five hours travel time from Fort McCoy, Wisconsin, where the majority of the unit's equipment is stored. Currently, each unit has one tank per platoon maintained at home station armories. Due to the limited availability of various training resources (to include time) the crews were suffering from insufficient hands-on-training to maintain proficiency with fire controls and crew duties. As a result of this problem, A Company decided to enhance tank crew training by painting a large snake-board, indoors, on an interior wall. Using the M55 Laser, common manipulation exercises were conducted, but the unit also added three-dimensional scale targets to the snake-board. This allowed for further crew interaction and engagement techniques.

The scale targets, when glued or bracket-mounted to the wall, are warmer than the wall surface. As a result, the crews can use the Tank Thermal Sight (TTS) of their M60A3s. When the loader used a dummy round, all turret crewmembers became involved. A Tank Crew Evaluator (TCE) evaluates crew duties, fire commands, and records targets "hit," as determined by the M55. This training technique added realism and provided a challenge to other crews and units.

A portable power supply and slave cable allow the tanks to maintain full charge on their batteries, and crews are able to incorporate power or manual mode of fire control operation. Platoons rotate crews through their assigned tank during the weekend drill.

As each company painted the snake-board at its armory, it tried to improve it. C Company wanted a greater variety of targets, so it added a flat two-dimensional target, heated with small hand-size heating pads. The type that hunters use work well. C Company also incorporated two 35-mm slide projectors to add vehicle identification to target engagement. Since the TTS will

As seen at left, Wisconsin Guardsmen painted a snake-board on their home armory wall to supplement range gunnery training. Not visible in this view are scale model targets, two-dimensional outline targets, and slide projector images used to enhance realism. A generator powers the tank.

not pick up the slide projections, the gunner must use a normal daylight sight, and with two projectors, a multiple engagement is presented. Crews have to engage correctly and properly identify the target. Vehicle recognition is thus incorporated into the training.

The snake-board with add-on targets is standard across the battalion. This type of training has proved extremely beneficial to the Mobilization-Day soldier. It provides not only actual hands-on-training, but also improves the soldiers' familiarity within their crew assignments. The end result for the "Will Do" Battalion was lower opening times and attainment of the published standard for qualification on TT VIII.

Lieutenant Colonel Gerald R. Whitfield joined the Wisconsin National Guard in 1956 as a basic infantryman. He served with 32nd Infantry Division during the Berlin Mobilization in 1961. After serving with Company D, 2-128 Infantry, he applied for OCS. He received his commission from the Wisconsin Military Academy. LTC Whitfield's following assignments include assistant planning and training officer in the G3, State Headquarters; and troop commander, 105th Cav. After branch transfer from Armor to Infantry, he served as battalion S2, 2-127 Infantry Battalion; brigade S2, 32nd SIB; battalion S3, 2-127 Infantry Battalion, which included a deployment exercise for Reforger 86, followed by assignment as battalion XO. He branch transferred back to Armor to assume his present assignment as commander of 1-632d Armor Battalion.

Major Douglas L. Dilday entered the Army as an Armor Officer in 1974 after graduating from Central Michigan University. He has been a support platoon leader, cavalry platoon leader, squadron motor officer, company commander, and S3, serving in several Armor and Cavalry units in Germany and CONUS. He also served in various operational staff assignments at division, corps, and army level. He has completed Armor Basic and Advanced Courses and the Motor Officer's Course, and is a recent graduate of C&GSC. He was assigned as the Army Advisor to the 1-632d Armor, 32d Separate Infantry Brigade, Wisconsin Army National Guard when he co-wrote this article. He is presently assigned to the USACACDA Threat Directorate, Fort Leavenworth, Kan.

LETTERS - *from Page 3*

vice support capability at brigade and below? I suspect we did.

CLARK A. BURNETT
COL (USA, Retired)
Enterprise, Ala.

"The APFT regularly reminds me of where I fit..."

Dear Sir:

CPT Schweppe's thoughts on Army fitness and combat readiness in last month's ARMOR caught my attention for many reasons. Among them are his and General Grey's quoted remarks which downplay correlations between soldier physical "readiness" and performance in the proven and economical APFT. England's Royal Marines were practicing General Grey's advice when I was training with them in 1983. We routinely performed the fireman's carry with our buddies in PT sessions. Sometimes we did this in "fighting gear", sometimes in shorts and Adidas. The difference was that rifles and boots slowed us down a bit. Also not surprisingly, the top performers in push-ups, sit-ups, and running were those same top performers in the gamut of more grueling tests - not because we had been practicing the fireman's carry in our spare time, but because we took pride in whatever we did.

I remain uncertain with segregating terms like "corporate fitness" and soldier "athletes". Do they fit on a continuum somewhere between Olympic champion and couch potato? Where do we draw the line? The APFT regularly reminds me where I fit and confirms what I have known for years: If you work a muscle, feed a muscle, and rest a muscle, its efficiency improves. This law, or something like it, must exist somewhere in the annals of science, but 20th Century Americans. civilian and military, still have trouble with at least one of its components. I know CPT Schweppe would like to put the infantry in rucksacks one day and judo gees the next. Let's include good ideas like this, as appropriate, to already successful training programs, and continue to monitor physical fitness/ readiness, or whatever we're calling strength, stamina, and spirit nowadays, with the APFT.

JAMES H. GILLISON
CPT, IN
APMS, Loyola U.
Chicago, Ill.

Creating an Army of Winners

by First Lieutenant Jeff Swisher

In 1988, the Detroit Pistons won the NBA Eastern Division and went on to play the Los Angeles Lakers in the NBA Championship. After the divisional game, the Boston Celtics passed on some valuable advice, "Don't be content just making it to the Championship. Go out there to win!" The Pistons did not understand the value of the advice and lost in 1988. However, in 1989 when they faced the Lakers again for the championship, the words rang true, and they won. What was the difference between the two years? *In 1989, the Pistons had a burning desire to win!*

We must instill this same burning desire to win in our soldiers. For the Army, the ultimate goal in war is to win, and in our profession, there may not be a next year to try again. As D.M. Malone puts it, in *Small Unit Leadership*, "That's because the first battle of that next come-as-you-are war, due to its intensity, could well be the only battle." We must adopt Vince Lombardi's attitude, "Winning's not everything; it's the only thing!" We must make winners out of soldiers. The purpose of this article is to describe for you how a winning attitude can greatly enhance your unit and how to make winners out of your soldiers.

A winning attitude in a unit gives three advantages. First, it raises the level of performance by the unit. Second, it builds esprit de corps. Finally, winning perpetuates winning.

In their book, *A Passion For Excellence*, Tom Peters and Nancy Austin say this about winners: *"Winners... don't do only a percent or two better than the norm. They do hundreds of percent better."*

Soldiers who are trained as winners will raise the performance level in a unit. The basic reason for this is in the process of creating winners, which I will discuss later. Briefly, challenging goals are established. As lower goals are met, higher goals are established. By reaching and setting higher goals, standards of performance also increase. The other reason for increased performance is that soldiers with a winning attitude will want to do better. They will want to win! Winning in these terms means being successful or reaching the goal set for them.

As all the soldiers strive to accomplish the goals set for them, esprit de corps develops in the unit. Unity is a logical product of soldiers faced with common goals, which can't always be reached without the help of a squad or platoon. By combining individual goals, the unit meets its goals. As the soldiers see their performance and that of the unit increase, their enthusiasm will grow. Unity and enthusiasm in a unit is *esprit de corps*. It is that simple.

The final benefit of creating winners is that winning attitudes create more winners. The new soldier entering a company of winners sees many things that make him want to be a winner. He sees high standards of discipline, training, and performance that he must meet. He sees a system in place to help him reach those standards. He sees the esprit de corps the unit possesses. Most soldiers seek a unit like this. The soldier is like the new draft choice of the Detroit Pistons. He is happy to be on a championship team, and he will work harder to make the squad and not to let his teammates down.

Now that we've seen the benefits of a winning organization, we must discuss the steps in developing the winning spirit. There are four steps in creating a winner. The first step is to show the soldier what a winner is. The second step is goal setting. The third step is his performance and feedback on the task. The final action is to reward his accomplishment of the goal.

When developing a winning spirit in an individual, we must first show him what a winner is. Show your soldier how to walk, talk, and act like a winner. The best way to accomplish this is to lead by example. Reflect a positive attitude, show pride in your

work, and display responsibility for your actions. Establish high personal standards, but most important, treat others like successful people – like winners.

Certain groups in the Army do a good job of teaching the winning attitude. The Airborne, Ranger, and Cavalry units come to mind immediately. When a private greets you with "Airborne!," he says more than "Good Morning." He tells you that he is part of a special organization and that he himself is special. However, all too often, units stop at this first step. They develop an attitude, but they fail to go on and develop winners. You must go beyond the attitude to the next step, which is goal setting.

Leaders, down to the lowest level, should sit down with soldiers to list goals. The goal-setting session should be one-on-one. The leader and the individual must agree on the goals, and the leader should write the goals down to refer to them later. The leader should discuss professional goals, unit goals, and personal goals with the soldier. The professional goals are individual tasks the soldier should accomplish to help him be a better soldier. An example is scoring an 85 on the next SQT test. The unit goals show the soldier how his work fits in the organization. For example, he has a goal to qualify with his crew on Tank Table VIII. This helps the unit goal of qualifying every crew in tank gunnery. Finally the soldier should list some personal goals. These could include getting an associate's degree or taking his family to see Disneyworld. The soldier's personal goals are listed also because they play an important part in the soldier feeling of success.

Every goal should be challenging and attainable. A goal which a soldier can accomplish immediately does little for him or the organization. Had the Pistons won the 1988 Championship by forfeit, it is doubtful they would have had the strong desire to win in 1989. Therefore, the soldier should have to work to achieve his goal, and the goal must be attainable. There is no reason to set a soldier up for failure. The purpose is to raise his level of performance through his training and instill in him the desire to win through his accomplishment of the goal. Success will encourage him to work for the next goal. Failure will only discourage him.

Once goal-setting is complete, the blood, sweat, and tears of the winning process begins. This is when we train the soldier. The training is tough and realistic. The standards need to increase to eventually reach the standards of the goal. Drills must be repeated again and again.

The leader offers the soldier constant feedback during the training process. Feedback is essential because it helps the soldier improve on his weaknesses. It also lets the soldier know where he stands in relation to his goal. Training without feedback is like the Pistons playing the Lakers, and no one keeping score. The soldier never knows if he won, lost, or how well he played the game.

Focus the feedback on the task and not on the individual. When the leader tells a soldier, "You screwed up," the soldier becomes defensive. Once this happens, the lesson is lost. When the feedback focuses on the task, the soldier will concentrate on the lesson. Also, make feedback timely and constant. Telling the Pistons the score of the game after it's over does little to help their performance. Likewise, to critique a soldier on his marksmanship just before he goes to qualify is too late. Give the feedback when he is training so he can make improvements. The leader, by providing feedback, guides the soldier to goal accomplishment. When the soldier accomplishes the goal, he is a winner! However, the work of the leader is still not over. He must recognize the accomplishment and reward the soldier. The reward may be as simple as a pat on the back, a good counseling statement, or recognition at a formation, but the leader must provide a reward. *Passion for Excellence* calls this process "celebrating" winners. The celebration, no matter how big or small, builds pride in the soldier. It also shows other soldiers that there is value in winning. This pride and the knowledge that he accomplished his goal give the soldier greater job satisfaction. The increased satisfaction makes it more likely for the soldier to work hard in the future.

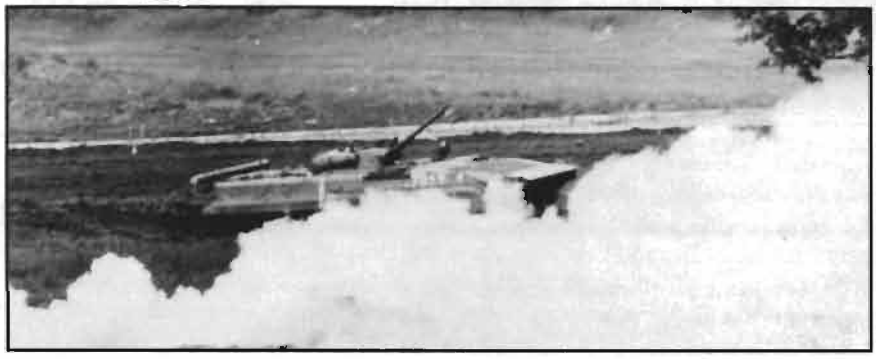
Now you have a winner, and the process of goal-setting starts again. What have you gained? Well you now have a better unit, because at the very least a single soldier improved himself. Combine the performance of all of the soldiers, and your unit's performance increases. The unit continues to develop esprit de corps as everyone joins the bandwagon to accomplish their goals and be celebrated as a winner. Finally, you instilled a desire to win – a desire to be successful – in the unit. The desire, once lit, will not easily disappear. And if the time ever arises when your men enter the battlefield where they must win, the desire and confidence will be present in each of them to keep them going. They will be winners.

First Lieutenant Jeff Swisher is a 1985 West Point graduate. He has served as a tank platoon leader, mortar platoon leader, and XO with 5-68 Armor. He is currently assigned to 24th Infantry Division, Ft. Stewart, Ga.

Soviet Vehicle Recognition Quiz

Compiled by Craig Hughes

1.



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Answers on Page 49

Commanders and Moral Courage

by Lieutenant Colonel James E. Swartz

From the beginning of armed conflict, commanders and their soldiers have pondered deep within themselves whether they might assemble that inexplicable combination of ferocious audacity, confidence in self and in others, and training preparation that might win the day on the next battlefield.

History, of course, is replete with accounts of wartime courage, from Alexander the Great's Macedonian victories over the Persians to Hannibal's Carthaginian victories against Rome, to more current examples, like the Soviets' gritty defense of the Dzerherzinsky Tractor Works at Stalingrad or MacAuliffe's stand with the 101st Airborne Division at Bastogne.

For most, these displays of battlefield courage have earned them accolades, promotions, and awards and decorations for valor. But courage owes no boundaries to places of battle, though history's focus perhaps rightfully has directed us there.

Indeed, although military commanders at all levels can learn much from wartime accounts of *physical* courage that fill our libraries, it is all the more likely that they shall face a multitude of questions involving *moral* courage in a peacetime setting. Toward that end, this article is directed.

It long has been part of the military lexicon that commanders should accept what is now widely known as the "harder right" rather than the "easier wrong," but all-too-frequent accounts say that the fastest way to the top of the military pyramid is to "avoid controversy" or to "keep your nose clean."

In short, conventional wisdom says that commanders should refrain from making the tough decisions, not make waves, and punch their ticket for the next assignment up the line.

Perhaps such wisdom is correct. Consider the case of *Generalfeldmarschall* Erwin Rommel, certainly one of Germany's most gifted tacticians, who argued that commanders should have "a certain independence of mind" that might help mold the next generation of German leaders.[1]

Rommel's candor – his forthright recommendations that frequently conflicted with those of Adolf Hitler – were morally courageous, but in the end, such views cost Rommel his life.

Hays and Thomas suggest that moral courage can be found in five distinct settings. These include reporting to others, making recommendations and decisions, following illegal or immoral orders, applying situational ethics, and avoiding blame.[2]

Reporting to Others

Commanders owe it to themselves, to their soldiers, and to their superiors to offer not only an accurate representation of the facts, but also a complete one. Thus, it is just as morally wrong to tell half the story, however truthfully, than to lie outright. But during the Vietnam War, for example, it became expedient to inflate body counts to legitimize battlefield successes.

This only harms the Army, as Hays and Thomas explain:

"Many times it requires considerable moral courage to report facts which thus indicate poor performance by the maker of the report. It also requires considerable courage to report to a senior commander facts he does not want to hear, even if they are true....every inaccurate or untrue report weakens the military structure, damages its efficiency, and makes the system more susceptible to subsequent and even greater falsifications inaccuracies."[3]

Recommendations and Decisions

Here is the category in which many commanders buckle to do what is safe, rather than what is morally right. Too often a senior commander will be told what he wants to hear or what is safe, rather than what he should hear, no matter how painful. This quality of "telling it like it is" becomes more difficult, of course, as one rises in rank and responsibility.

Consider the case of Union Major General George H. Thomas, who made the harder recommendation at the risk of his career. In January of 1862, at Mill Springs, Kentucky, Thomas won perhaps the most significant Northern victory to that date. His fortunes rising in Washington, Thomas was ordered to take the place of his superior, Major General Don Carlos Buell, who was misperceived as ordering a retreat in that region. Thomas declined the command, contending that Buell had in fact ordered an advance and was gaining ground. Thus, Thomas' sense of ethics, justice, and loyalty to his commander put his own career in peril.

When Major General William S. Rosecrans succeeded Buell a month later, Thomas again courageously pointed out that such an order would be invalid because the incoming Army of the Ohio commander would be junior in rank to him. President Lincoln fixed the situation by back-dating Rosecrans' promotion date – a certain message that he did not appreciate Thomas' brutally frank recommendations.[4]

In the end, however, history sided with Thomas, as it has with Rommel. Rosecrans served with little distinction in the western theater; Thomas went on to glory as the "Rock of Chickamauga" in the bloody victory near Chattanooga.

Following Illegal or Immoral Orders

Perhaps the easiest of the five points to avoid, commanders have at times contended that they should not be punished for foolish deeds because they were following their superiors' orders. This was the lame excuse Nazi zealots gave at the lengthy Nuremburg Trials, and by various members of the Americal Division after the My Lai massacres. Most recently, retired Marine Corps Lieutenant Colonel Oliver North gave this excuse for his dealings with foreign arms dealers against government policies. While it is clear that the offenses at Bergen-Belsen are by no means the equal of North's transgressions, the defense is equally thin according to law.

Situational Ethics

This principle applies throughout our lives, whether dealing with property, money, or people. Lieutenant General (Ret.) Julius Becton, then VII Corps commander, said it best when he told students at the United States Army Command and General Staff College in 1979, "Integrity is non-negotiable."[5]

A more complete view toward situational ethics was rendered by former Army Chief of Staff William C. Westmoreland, who wrote a personal letter to every officer in the Army. It said in part:

I want to make it clear beyond any question that absolute integrity of an officer's word, deed, and signature is a matter that permits no compromise. Inevitably, in the turmoil of the times, every officer will be confronted by situations which test his character. On these occasions he must stand on his principles, for these are the crucial episodes that determine the worth of a man. . . .the officer who sacrifices his integrity sacrifices all; he will lose the respect and trust of those he seeks to lead, and he will degrade the reputation of his profession. The good repute of the officer corps is a responsibility shared by each officer.[6]

"While it is clear that the offenses at Bergen-Belsen are by no means the equal of North's transgressions, the defense is equally thin according to law."

Then there is the situation confronting commanders, such as this one: One Army post required all commanders to sign a statement that their outbound soldiers had indeed cleared the post library. At least one commander balked, signing for his dozens of men, even though he could not confirm the action rendered by his signature. Situational ethics? No – lack of moral courage. The commander should have fought to change a poor Army policy, even if it was the unpopular thing to do.

Avoiding Blame

There is an exception to every rule, and brutal honesty knows its bounds as well. The military code expects commanders to assume blame even if they are blameless. This is one lesson this writer learned the hard way. There is an unwritten rule that requires commanders to assume responsibility for everything a unit does or fails to do. Thus, it is better to say "I screwed up," even though you were not directly involved, rather than, "Our S4 shop dropped the ball on that one." That, too, is a part of

moral courage. In the end, the commander dropped the ball for not assuring that his S4 section was functioning properly.

Various German generals and historians write of the *Feldherr*, the model commander, a man with the courage of his convictions, no matter how unpopular, in addition to his tactical genius. American writers generally agree. Colonel (Ret.) Dandridge Malone studied officer efficiency reports from a variety of western nations. His conclusion was that moral courage was a common attribute for officers to seek.[7]

Courage is a clear-cut entity on the battlefield. As a bosun's mate noted after a bayonet attack in the South Pacific, "Freedom is what makes us fight, and courage keeps us from running away."[8] But sometimes, courage away from the battlefield – in the day rooms and headquarters where commanders are paid to make the difficult calls -- that's where courage is even more difficult. There, it is not monitored. It is there that it may never be seen. It is there, perhaps, that only the commander will know he chose the difficult and unpopular decision because in his heart it was the right thing to do.

Endnotes

[1]B.H. Liddell Hart, (Ed.), The Rommel Papers (New York: Harcourt, Brace, 1953), p. 518.

[2]Samuel H. Hays and William N. Thomas. Taking Command (Harrisburg, Pa.. Stackpole. 1967), pp. 55-56.

[3]Ibid.

[4]Martin Blumenson and James L. Stokesbury. Masters of the Art of Command (Boston: Houghton Mifflin, 1975), p. 158.

[5]Speech. United States Army Command and General Staff College, Ft. Leavenworth, Kan., November 1979.

[6]Edward M. Flanagan Jr., Before the Battle (San Francisco: Presidio. 1985), p. 111.

[7]Roger H. Nye, The Challenge of Command (Wayne, N.J., Avery, 1986), p. 23.

[8]Ibid.. p. 81. Also see C.A. Leader, "Risk Aversion and the Absence of Moral Courage," Illustrated Marine Corps Gazette, 67 (August 1983), pp. 65-69.

Lieutenant Colonel James E. Swartz commands 1-185 Armor, California Army National Guard. Previous assignments have been as S3, 4-112 Armor; XO, 6-68 Armor; and Assistant G3, 40th Infantry Division; III Corps; and Northern Army Group, FRG. A 1980 honor graduate of CGSC, he holds an MMAS degree from that institution along with a Ph.D. from the University of Iowa.

Recognition Quiz Answers

1. T-55. The T-55 medium tank has five road wheels on each side of the chassis, with a space between the first and second road wheels and no return rollers. The T-55 has a low silhouette hull with a dome-shaped turret mounted over the third road wheel. The main armament is a 100-mm rifled cannon with a bore evacuator at the muzzle. An upgraded version of the tank, seen here, includes a "strap-on" laser rangefinder, crosswind sensor, and a warning device that alerts the crew when it is being lased.

2. BMP-1. The BMP is a fully armored, amphibious, infantry combat vehicle. Its low silhouette hull has a sharp, sloping front with a conspicuously ridged surface. A centrally located, extremely flat, truncated cone turret mounts a 73-mm smoothbore gun and a 7.62-mm coaxial machine gun. The BMP has the range and speed to keep up with the fast-moving tanks it normally follows in offensive formations.

3. T-72. The T-72 has six, large, die-cast, rubber-coated road wheels and three track-return rollers. The tank has a larger engine compartment than the T-64, and its radiator grille is near the rear of the hull. The gunner's IR searchlight sits on the right of the main gun. The 12.7-mm NSV AA machine gun has a rotating mount and cannot be fired from within the tank.

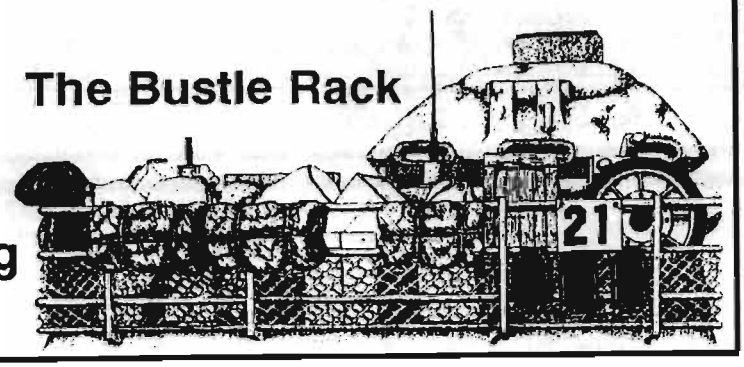
4. T-55.

5. T-64. The T-64 and T-72 medium tanks are similar in appearance, but there are several design differences. Those features peculiar to the T-64 include six small, stamped road wheels; four track-return rollers; a 12-tooth drive sprocket; double-pin, rubber-bushed track; and linear-type shock absorbers. Other notable features include the gunner's IR searchlight mounted to the left of the main gun and a newly-designed 12.7-mm. AA machine gun on the commander's cupola with fixed mount. A crewman can fire this machine gun buttoned up.

6.BMP-1

This month's quiz was compiled by Craig M. Hughes of the Threat Division, DCD, AV 464-4757 or commercial (502) 624-4757. Threat Division encourages comments, questions, and suggestions.

The Bustle Rack



Camo Covers Are Coming For Soft-Top Vehicles

Ever wonder why the Army goes to great length to paint its combat vehicles in camouflage schemes, while the ubiquitous canvas tops on jeeps and trucks are still plain green? We camouflage BDUs, and they're cloth, aren't they?

In fact, for several years now, camouflage experts at the Ft. Belvoir Research. Development, and Engineering Center have been wondering about the same thing, and they're about to do something about it, according to a recent news release from the Center. The problem has been that it just isn't as easy to print an effective camouflage pattern on the vehicle soft tops and cargo covers as on BDUs, which are much smaller.

Using the same pattern as that on the BDUs would result in patterns repeating themselves too often on the larger surfaces. What's more, the patterns have to merge with the vehicle's existing camouflage pattern to be most effective.

Now a computer-controlled process has been developed to do the printing and coating, and to ensure that the canvas pattern mates with the vehicle's existing pattern when installed. The new tops will be introduced sometime in the next year.

USAARMS' C&S Department Seeks Photos of Armor Leaders

The Command and Staff Department, USAARMS, has established a photo display of current commanders of tank and cavalry battalions, squadrons, brigades, and regiments at Boudinot Hall.

The department requests that all commanders send an 8-by-10-inch photograph of themselves in uniform to the Professional Development Division, USAARMS, ATTN: ATSB-CS-PDD-T, Fort Knox, Ky., 40121-5211, if they have not already done so.

The so-called "Stud Wall" provides students, faculty, and guests the opportunity to put faces and names with their units, and honors those selected to command our soldiers.

Scouts Returning to States Sought for Airborne Training

The Army is asking cavalry scouts who are nearing the end of their tours overseas to volunteer for airborne training and assignment in the 82d Airborne Division, Fort Bragg, N.C., and the Joint Readiness Training Center, Fort Chaffee, Ark.

Interested scouts are asked to apply at their local personnel offices at least six months prior to stateside rotation. AR 614-200 lists the criteria for airborne applicants.

Criteria Changing for Bradley Master Gunner School

In October, the prerequisites for attending Bradley Master Gunner School will change. Soldiers must now be in the grades E-5(P) through E-7, have a GT score of 100 or better, and be qualified as instructor-operators on the Unit Conduct of Fire Trainer.

Soldiers interested in attending must submit DA Form 4187 with UCOFT certificate of training attached. They must volunteer and be recommended by their battalion or squadron commanders. This letter of recommendation should also accompany the Form 4187.

Only E8s and Above Should Call for Pinpoint Assignments

Soldiers often call the Armor Branch, Total Army Personnel Command, when they come down on levy for overseas assignment. They want to know about their pinpoint assignment, the unit they will ultimately join overseas.

According to TAPA, pinpoint assignments are only requested and verified for E8 and above. E1s through E7s are placed on requisition to the 21st Replacement Detachment, which later assigns them to their new unit. The gaining installation is then responsible for sending the soldier a welcoming packet, which acts as his notification of his future unit. To request a specific unit or regimental preference, coordinate through your local MILPO or PSC.

Enlisted Career Guide Was Delayed in Publication

The Armor Enlisted Professional Development Guide, which was due out in June, was delayed and is scheduled to be available this month.

The guide provides commanders, NCOs, and soldiers easy-to-read, straightforward guidance on professional development within Career Management Field 19. Initial distribution will be at the battalion/squadron level, and the guide will NOT be available through the AG Publication system.

Local commands are authorized to reproduce the guide locally, if needed. Some copies may be available through Army Wide Training Support.

Commanders need to pay special attention to Chapter 4, which has specific information on changes in the Excellence in Armor Program. For more information, call CPT Lucier or MSG Merder, AV 464-5155/3188 or commercial (502) 624-5155/3188.

Publisher Seeks Contributors For Korean War Reference

Garland Publishing, Inc., of New York is preparing a compact encyclopedia covering the Korean War, and is seeking contributors of articles ranging from 50 to 5,000 words.. Articles would concern military engagements, air operations, weapons and technology, diplomacy, personnel issues, psychological operations, armistice negotiations, etc.

Further information is available from Dr. Stanley Sandler, 507 S. 5th Street, Spring Lake, N.C., 28390.

Former Armor-Cavalry Advisors Seek to Form an Association

Army veterans who served as Armor and Cavalry advisors to the Republic of Vietnam are hoping to form an association, with plans for a reunion, if there is sufficient interest.

The idea grew out of correspondence between Kenneth P. Lord, a former advisor, and COL Ray Battreall, former editor-in-chief of ARMOR Magazine. Lord, now the S3 of an MP Reserve unit in Gaithersburg, Md., is organizing the effort.

In addition to reuniting old comrades, the organization would attempt to capture the vast amount of historical knowledge these advisors could contribute. Despite the recent flood of Vietnam history, little has been said about the advisors, Lord noted.

For further information, contact Kenneth Lord, 5352 Anchor Court, Fairfax, Va. 22032.

Army Awards R&D Contract For Tank Radar Warning Device

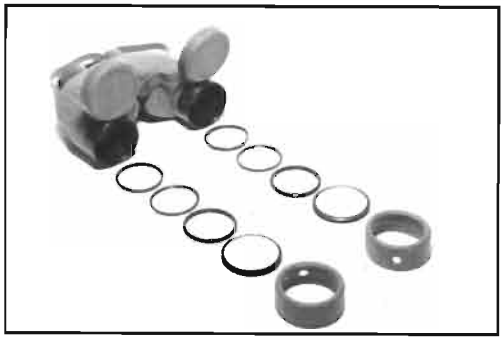
The Army is considering adding radar warning detection equipment to main battle tanks and has awarded a $1 million contract for development of the demonstation model, according to a report in Jane's Defence Weekly.

The magazine quoted a spokesman for the Army's Communications and Electronics Command as saying that there were no immediate plans to add the receiver to any specific vehicle. At this stage, it is purely an R&D program, according to the report.

Jane's noted that current Soviet antitank missiles are wire-guided, manual command to line-of-sight, or semiautomatic command to line-of-sight. The report speculated that the receiver may be in development anticipating introduction of a radar-guided ATGM on the new Mil-28 Havoc attack helicopter.

A radar warning receiver would give crews time to take countermeasures, including the launch of decoys. Several nations - among them France, Israel, Italy, Japan, and the UK - have tested laser warning receivers, and Israel has fielded the first such device on the new Merkava 3 model. These systems might be adaptable to radar warning, too, Jane's reported.

Laser protection is included in new M22 binoculars. What seems to be a "third lens" is actually the lens cap assembly.



The Army's new M22 binoculars, with lens caps and filters. Binocular tubes are made of high-strength plastics covered in rubber.

New Plastic Binoculars Include Rangefinder Reticle, Laser Filters

Soldiers are very happy with the new M22 binoculars now trickling into the field, according to the Army's Armament Research, Development & Engineering Center, which fielded the replacement of the old M19 metal binoculars.

No negative comments have been received from units in Korea, West Germany, Fort Sill, Fort Bragg, and Fort Hood, where the new binoculars were first fielded. The new glasses have been in production since 1988. About 23,000 had been shipped to the field by July.

Esssentially a militarized version of the West German Steiner Optic 7x50, the M22s are made of lightweight, temperature-resistant, and unbreakable fiber-reinforced polycarbonate. The 3.5-pound binoculars also incorporate special filters to protect the eyes from lasers. A horizontal and vertical reticle allows the binoculars to be used as a rangefinder if the target width is known.

Czechs Begin Deactivation Of Tank Regiment

The Czechoslovakian news service reports that the army has begun dismantling a tank regiment stationed at Ceske Budejovice, in Southern Bohemia.

The regiment was eliminated from the Czech Army's active combat forces as of August 1. It is believed to consist of T-54/55-series tanks. "The tanks will be liquidated, the materials stored, and the troops transferred, either to the reserve forces or to new army construction units," according to the news service. (See story on page 5 of this issue. -Ed.)

Pages Transposed In HMMWV Story

Because of a layout error in our last issue, the story, "HMMWVs and Scouts: Do They Mix?" appeared with pages out of normal order. Facing pages 34 and 35 and 36-37 were reversed.

Our apologies go to our readers and to Major Barry Scribner, the author.

- Ed.

Light tanks knocked out in the Lang Vei battle. The photo above shows burned-out tank hull with turret at left of hull.

Book Review: "Tanks in the Wire"

New Vietnam Book Recounts Rare Encounter With Enemy Armor

Tanks in the Wire, by David B. Stockwell, Daring Books, Canton, Ohio, 205 pages.

One of the major stories to come out of Vietnam in 1968 was the siege of the Marine garrison at Khe Sanh. The images of Marines pinned down by massive artillery barrages and unseen hordes of NVA regulars filled America's living rooms. Veterans spoke of similar experiences in World War II and Korea.

All the while, one of the most significant events of the war was unfolding just five miles away. Saigon scoffed, and even local commanders were skeptical, but the rumors and reports of the presence of enemy armor on the Khe Sanh plateau piled in as January ended, and the Tet holiday began. Finally, out of the early morning darkness of the 7th of February came the noise that struck fear into the hearts of infantrymen everywhere. The multinational defenders of Lang Vei Special Forces Camp were momentarily mesmerized - there were TANKS in the wire!

Captain David Stockwell's account of these remarkable events capsulizes much of what was good and what was bad in the American experience in Southeast Asia. Tanks in the Wire recounts the events leading up to, during, and after the battle at Lang Vei Special Forces Camp, when the North Vietnamese Army first used tanks – 11 Soviet-made PT-76 amphibious tanks. (Some accounts contend these were Chinese-built Type 63s, a similar but not identical amphibious light tank. Ed.) Moreover, he tells of incredible bravery by honest men against even more incredible odds; of commanders too far away from or too high above the sound of the guns to believe those who were in the battle's cauldron; of petty inter-service rivalries which cost American lives; of America's allies – the Vietnamese, Lao, and Montagnard co-defenders of Lang Vei – whose character and actions even today remain so inscrutable to those who fought side-by-side with them, and finally, of an enemy whose fanatical courage in the face of massive firepower has to bring a grudging admiration.

The armor battle at the Lang Vei Special Forces Camp does not match the historical significance of Yorktown, Gettysburg, or the Falaise Gap. But in the tradition of Valley Forge, St. Vith, and the Pusan Perimeter, it is a story of American soldiers fighting against the odds. Tanks in the Wire does their bravery justice.

DONALD C. SNEDEKER
LTC, Cavalry

Air Force Phantom with precision-guided GBU-15 under the wing.

Two Air Campaigns in Vietnam: Why One Worked and the Other Didn't

The Limits of Air Power, by Mark Clodfelter. The Free Press, New York, 1989. 297 pages. $22.95.

The current debate over the future of the Air Force close air support mission is being closely watched by soldiers who will require this support in combat. Army Times, and similar Army-oriented publications, cover the issues in the debate: Should the stress be on immediate air support at the FLOT or directed at the enemy's rear and supply trains, hoping to affect the battle that has yet to develop? Should the aircraft be slow, big-payload, long-loitering, but more vulnerable A-10s, or more survivable fast-movers like the proposed A-16? The May-June 1988 issue of ARMOR even had an "open letter" from Air Force General Robert D. Russ, commander of the Tactical Air Command, reassuring the Army that "our commitment to the 1946 agreement to support the Army remains carved in granite."

Combat arms officers and NCOs tend to think of air support in close-in terms: is there going to be an aircraft available when my battalion runs into trouble? Can he find the target in this mess? Can he stick around for a while?

But this is only a third of the Tactical Air Command's mission, so-called close air support, or CAS. A second mission is to destroy supply trains and stop reinforcements well beyond the FLOT, the mission called interdiction. The third mission, counter-air, is simply the control of the air space over the battlefield, both close-in and deep, that allows CAS and interdiction to proceed unimpeded, the "top cover" that makes it all possible.

The dangerous missions of AirLand Battle have quickened interest in Air Force strategy among Army leaders. It is more critical than ever that the Air Force "be there."

Mark Clodfelter's new book on the effects of bombing North Vietnam is a good basis for understanding not only how the Air Force thinks, and why, but also on how successful its doctrine emerged in the kind of low-intensity war we're most likely to fight. Clodfelter, an associate professor of history at the Air Force Academy, examines "Rolling Thunder," the early bombing of the North under President Johnson, and "Linebacker," the air campaign waged by President Nixon later in the war.

"Rolling Thunder" didn't work; "Linebacker" was devastating. Both were air interdiction campaigns based on the lessons of WWII and Korea. They were tactical in nature, intended to slow the rate of infiltration into South Vietnam by stopping the flow of logistics, a key doctrinal goal of Air Force strategy since WWII. The author carefully examines why one campaign made a difference while the other failed.

The simplistic answer was that Johnson was unwilling to unleash air power's full potential because of political considerations, that China or the Soviets would enter the war on the side of the North. While Nixon did give the Air Force planners more latitude, by then the international situation had changed, and both China and the Soviets were not thought likely to intervene. But there was another difference: by the time Nixon ordered the first "Linebacker" strike, the nature of the conflict in South Vietnam had changed, too. Larger forces, the regulars from North Vietnam, had begun trying to fight a more conventional war, and this required a supply system far more intense than the rice and bullets that sustained the Viet Cong in earlier days, when the average guerilla fought only one day in thirty. This meant more intensified logistics, and suddenly, there were the kind of targets that suited the Air Force doctrine.

This is an important book for Army fighters. Just as it is important for Armor officers to follow doctrinal changes in other Army branches, it is equally important to understand the thinking of the blue-suiters who control the battlefield's third dimension.

JON CLEMENS
Armor Staff

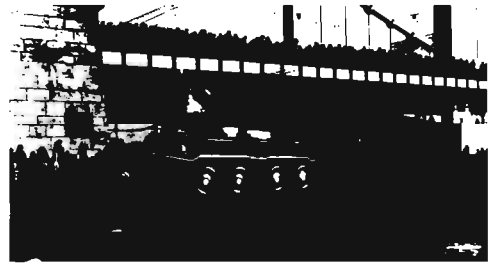
ARMOR Policy On "Shotgunning"

TRADOC's Professional Bulletin policy discourages the reprinting of the same article in more than one of the branch publications. In some cases, authors have submitted copies of the same story to several TRADOC bulletins, both planned to use them, and problems have developed after considerable work was done on the stories.

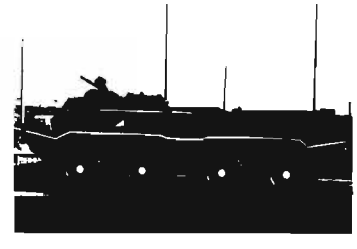
Our policy is to accept stories only on an exclusive first-print basis. We ask all prospective contributors to inform us if the story has been submitted elsewhere.

ARMOR will continue to reprint, with permission, a few selected articles from military magazines when the source magazines are not readily available to the field.

BTR-80
SOVIET ARMORED PERSONNEL CARRIER



BTR-80 (B + ⊡ APC with new hatch arrangement between second and third axles open and showing bank of smoke dischargers on turret rear

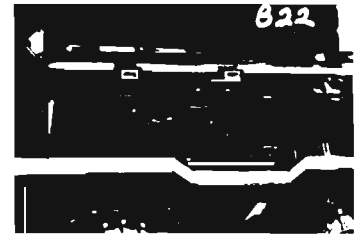


BTR 80 CHARACTERISTICS

VEHICLE CHARACTERISTICS	BTR-80
CREW	3 (cdr, driver, gunner) +8 passengers
WEIGHT (mt)	11.0
LENGTH	
Gun forward (m)	7.53
Without gun (m)	7.53
WIDTH, overall (m)	2.80
HEIGHT, overall (m)	2.33
ENGINE	V-8, 260hp, diesel (Turbocharged)
SPEED	
Road (km/hr)	80-85
Water (km/hr)	10
FUEL CAPACITY (liters)	290
ROAD RANGE (km)	500
TRENCH CROSSING (m)	2.50
VERTICAL STEP (m)	0.50
GRADEABILITY (°)	30
FORDING (m)	amphibious
ARMOR (maximum)	
Hull (mm)	25
Turret (mm)	7
INFRARED	
Driver	yes
Gunner	no
Commander	yes
NBC PROTECTION	filtration and over-pressure system
DDI	1984
STATUS	standard

MAIN ARMAMENT CHARACTERISTICS	BTR-80
CALIBER (mm)	14.5
NUMBER	1
TYPE	turret-mounted machine gun
MODEL	KPVT
TRAVERSE (°)	360
ELEVATION (°)	-5 to +60
STABILIZATION	no
FIRE CONTROL	telescopic sight
BASIC LOAD (rd)	500

SECONDARY ARMAMENT CHARACTERISTICS	BTR-80
CALIBER (mm)	7.53
NUMBER	1
TYPE	coaxial machine gun
MODEL	PKT
BASIC LOAD (rd)	2,000



This 24-by-27-inch poster of the Soviet BTR-80 armored personnel carrier is the latest in a series on Soviet tanks, armored vehicles, helicopters, and ATGMs to be produced by Threat Division, Directorate of Combat Developments, Fort Knox. Units may request copies by phoning Army-Wide Training Support Branch at AV 464-AWTS or 502-624-AWTS

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