ARMOUR BULLETIN DES BLINDES

VOLUME 14 1982

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EDITOR - LCOL R.N. Lawrence, C.D.

All correspondence should be addressed to the Editor, C/O Armour School, Combat Training Centre, Canadian Forces Base Gagetown, Oromocto, N.B., EOG 2PO.

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REDACTEUR - LCOL R.N. Lawrence, C.D.

Toute correspondance doit être adressée au rédacteur, aux soins de l'Ecole des Blindés, Centre d'Instruction de Combat, BFC Gagetown, Oromocto, N.B., EOG 2PO.

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ARMOUR BULLETIN

EDITOR'S COMMENTS

This issue of the Armour Bulletin initiates a slightly different format of the publication. No grandiose changes will be apparent to you, the reader, but we have changed things here and there.

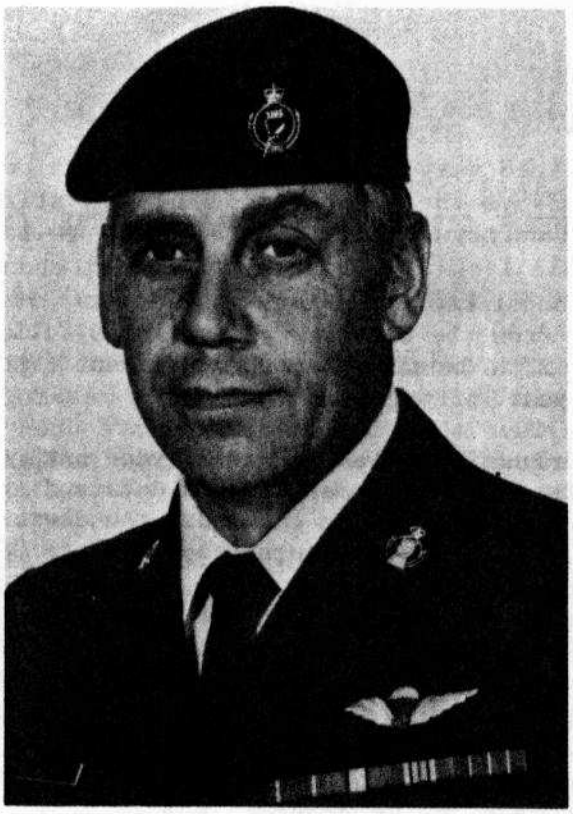
First among the changes is that the Editor is now the Commandant of the Armour School, LCol R.N. Lawrence, CD. Working with him as Assistant Editor and responsible for circulation is Capt J.A. Stuckart. As usual, the production of this issue is made possible only because of the cooperation and assistance of Mrs. Frances Smith.

I have also included a new feature, *"FEEDBACK - WHAT OUR READERS HAVE TO SAY"* which I would like to maintain in future issues. Your comments and support would be most appreciated. Our AFV Recognition Test is a little more extensive this time and hopefully, a little more challenging. Finally, I have included some reprints of interesting articles that were published in the old Armour Corps Journal.

As usual, this column is where I ask for contributions for future editions. Regardless of where or who you are, Regular or Reserve, Officer or Other Rank, this publication is the Corps' professional journal and it requires your support. It might interest you to know that this journal is seen by far more people than those at the School and Regiments. Issues are sent to all HQ's in the Canadian Forces, the CDS, CDLS Washington, CDLS London, and various NATO allies. The end result is a distribution list of approximately 1,000 copies! Now that should tempt any budding Kipling or Hackett out there.

Again, my thanks to all who have contributed to the production of Volume 14. I know you will enjoy their efforts.

R.N. Lawrence
Lieutenant-Colonel
Editor



DIRECTOR OF ARMOUR'S FOREWORD

The period since our last Bulletin has been a very active one for the Armoured Corps. The document "Armour 81-85" has been published; the Regular Force Regiments, augmented by a number of Militia crewmen, took part in RV 81; we were able to hold "Black Hat" concentrations in a number of Militia areas; the RCD took part in CAT 81; and the Association held a very informative, active and rewarding conference in Calgary during September. All of this has helped provide us with guidance and the impetus for the next few years.

I strongly commend "Armour 81-85" to everyone. The Militia portion of the document still needs refining but nevertheless it is one document which aims at bringing us into line with the "Total Force" concept. What we must now do is get on with the objectives as laid down, and most important, as I stated in our last Bulletin "Tanks for Canada; that is our quest!"

RV 81 provided the vehicle for us to train and thus maintain our combat capability, but equally as important, it permitted all ranks to rub shoulders, renew many old acquaintances and make new ones. One of the highlights of the concentration was the Cougar Gunnery and Recce Competitions. Both created a great deal of enthusiasm amongst the participants and a great deal was learned in the process. They also proved, however, that there is considerable room for improvement. The Strathconas are to be commended for their achievements in both competitions but must also be placed on notice for the next time around.

The RCD trained very hard and put forward a concerted effort into CAT 81. As always the competition was very stiff and our crews performed well but unfortunately we were unable to take top honours. I am sure we are all looking forward to the next chance to prove our professionalism in 1983.

The introduction of Cougar and the Armour Regiment concentrations for the Militia Units certainly have us heading in the right direction. I believe the time is not far off when the Militia Regiments will find performing as part of the combined arms team second nature.

I must congratulate the LdSH(RC) for the excellent manner in which they hosted our 1981 Association Conference. The dedicated work done by the many delegates involved at the Conference goes a long way in helping to perpetuate the ideals of the Corps.

As we close out 1981 I feel we can look back with a certain amount of satisfaction of a job well done. The lessons learned from all events have provided us the challenge for 1982.

C. Milner
Colonel
Director of Armour

THE SPLIT SQUADRON CONCEPT

By Major D.W. Prosser

Editor's Note: The following article is an excerpt from a brief prepared by OC Tactics Squadron to redress Corps doctrine concerning the half squadron as expressed in CFP 305(1). The brief was discussed in November at a meeting of the Army Tactics and Doctrine Board. Some of the supporting data could not be included in this article because of it's security classification.

BACKGROUND

1. Corps doctrine as expressed in Chapter 3, Section 4 of CFP 305(1) is not sufficiently explicit and does not fully examine the impact of splitting the squadron. Although the Armour Study enunciates clearly the broader aspects of the employment of Armour, CFP 305(1) fails to make a categorical statement of doctrine. In practical terms this has resulted in:

   a. Misemployment of armour by battle group commanders; and

   b. Lack of a doctrinal base for the armoured advisor to fall back on when making recommendations concerning the employment of armour.

THE PROBLEM

2. In recent years, particularly in NWE, the tendency has been to attach a half squadron to each infantry battle group from either one parent squadron or two separate squadrons. This creates a myriad of problems, not the least of which is that some commanders now believe that the half squadron is a viable organization.

3. Historically and in practical terms the tank squadron is not designed to split in half for other than some of the specific tasks alluded to in CFP 305(1). In fact, some of the tasks defined as "half squadron" tasks in that article are not half squadron tasks at all. For example, if half of the squadron is in the fire base the other half of the squadron is part of the assault. Thus the squadron is still fighting as an entity and none of the principles of command and control, mutual support, shock effect or manoeuvre to bring aggressive and massed fire to bear have been violated.

4. The tactic for the employment of a half squadron in the battalion defence lacks detail in CFP 305(1). Inevitably troops are further suballotted to companies or are tied to static positions within the company defence, or in some cases are further penny packeted.

IMPACT OF SPLITTING

5. CFP 305(1) states that as a principle the squadron should not be decentralized below a half squadron. In fact as a principle the squadron should not detach more than a troop. In practical terms the squadron is simply not structured to fight below squadron/combat team size for the following reasons:

a. A split squadron implies a split SHQ. SHQ thus lacks depth, the OC loses the backup provided by the BC, and SHQ no longer has a 24 hour operational capability. Should the OC or BC be required for orders there is no one to command the half squadron. If either become a casualty there is no one to assume immediate command;

b. SHQ intact provides the manoeuvre and protective element which allows the squadron commander to move as necessary on the battlefield to exercise command and influence the battle. Without SHQ intact he must tie himself to a troop. This is not acceptable;

c. An SHQ which is intact provides the fifth troop to the squadron in terms of firepower. SHQ should carry the bulk of main armament smoke for the squadron as the normal distribution is only four rounds per tank;

d. The echelon is not structured to split or support two half squadrons. If elements are required to support a split squadron:

(1) There is only one Rad Tech and one ARV. Currently, in Germany, there is only one Elm Tech. The Elm Tech is particularly critical when we consider that many gun problems involve electrical faults. Thus no quick fix is available to half of the squadron;

(2) Ammo resupply becomes critical. When the echelon is split all of the ammo M 548's are forward, thus there is no back-up in A2 and obviously no back-up in terms of a vehicle casualty. The Infantry cannot meet our ammo needs, nor can they carry our immediate resupply of POL.

(3) Giving an ammo and POL carrier to each half-squadron only increases the problem in terms of time and space between A1 and A2 echelon and eventually between A2, B, and the Service Battalion. Experience on exercises in NWE indicates that in practical terms resupply times are at least tripled;

(4) A split echelon reduces considerably the manpower usually available to handle the tonnages of ammo and POL which A1 and A2 must handle on a daily basis;

(5) The A1 Echelon Commander loses his backup or immediate second in command and thus has the same problem as a split SHQ when we think in terms of the 24 hour battle;

(6) The split echelon does not have the manpower or weapons for its own immediate security. This is particularly critical as armour tends to keep its immediate replenishment closer to F Ech than does the Infantry.

6. The final impact, of course, when considering the viability of a half squadron relates to how much shock/mass it really has. In fact, its scope for mass/shock effect is virtually non-existent as soon as the first enemy rounds are fired. We can expect to lose three or four tanks in a relatively short time. By simple mathematics, we are now talking about the shock action of five or six tanks. That is neither mass nor is it shock.

SUMMARY AND RECOMMENDATIONS

7. The material in CFP 305(1) dealing with the split squadron is misleading, lacks detail and is in part, incorrect. There is a distinct difference between a half-squadron and the tasks which are alluded to as half-squadron tasks in Chapter 3.

8. A tank squadron is not structured to fight as two half squadrons. Neither SHQ nor the echelon is designed to command or resupply a split squadron. The mass/shock effect of a half-squadron does not exist as soon as the first shots are fired.

9. The employment of the half squadron in the battalion defensive area is not sufficiently explicit in CFP 305(1). In addition to the command and control problems and the difficulty of resupply, tanks tend to be tied to static positions and in general terms are further split to company and platoon positions. Without trying to educate the educated we must be more explicit with regard to the deployment of the tanks, i.e., tanks must remain concentrated (not split) and must be manoeuverable within the framework of the battalion defensive area to bring concentrated fire to bear and thus exploit mass and shock. Ignoring this basic principle totally defeats the raison d'etre for armour.

FEEDBACK - WHAT OUR READERS HAVE TO SAY

Captain J.M. Snell, CD

Comments on "The Anti-Tank Helicopter Threat" by Lt P.G. Ward,

Armour Bulletin Volume 12.

I read with interest Lt Ward's article on the attack helicopter. In general, I support his conclusion that the "anti-Armour helicopter is an effective and highly mobile system" and that it must be integrated into the current anti-armour inventory. Nevertheless, I feel that he has treated lightly some rather salient limitations.

A primary difficulty is that we really do not know how effective the weapon will be under "modern" battlefield conditions. To date, combat experience for the attack helicopter has been, for the large part, confined to either low intensity (Vietnam) or unique (Afghanistan) conflicts. Without dwelling on the obvious constraints of weather and met, there is a comprehensive litany of unknowns. What are its limitations in an highly active EW battlefield? Have techniques and tactics been refined for an NBC environment? How vulnerable is it to other weapons systems (artillery, heat-seeking SAM's, small arms and AA fire)? Finally, can we analyze the pilot's "pucker factor"? How long in face of the unknowns indicated above can the attack helicopter pilot maintain that perfect sight picture? Ten, fifteen seconds?

In my opinion, data available from previously conducted trials is inconclusive and makes excessive claims as to the effectiveness of the attack helicopter. The Ansback trial credited a Cobra with a total kill regardless of where it hit the tank. Is this realistic? Would the faster movement of Leopard over Centurion significantly change the kill ratio?

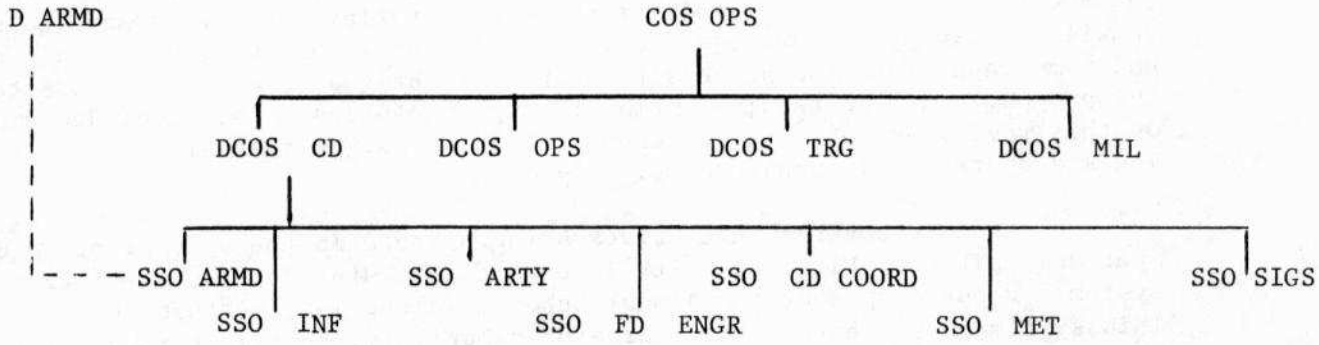
Finally, the one factor that concerns me is the length of exposure time required by the pilot to fire the anti-armour system. I would suggest that 15 seconds may be the optimum. Any longer will certainly increase the vulnerability of this mobile weapon platform. Most tankers would readily welcome a 20 second exposure and a clean engagement with a kinetic round.

In conclusion, I believe that we should not overestimate the present capability of the anti-armour helicopter. In the same vein, we must be prepared to recognize its future potential as the state of the art is refined. Today's tactical scenario does not permit us to treat the attack helicopter as an organic and instrinic component of our battle plan. Rather we must be prepared to superimpose it upon our plans as a fortunate addition but not as the foundation stone.

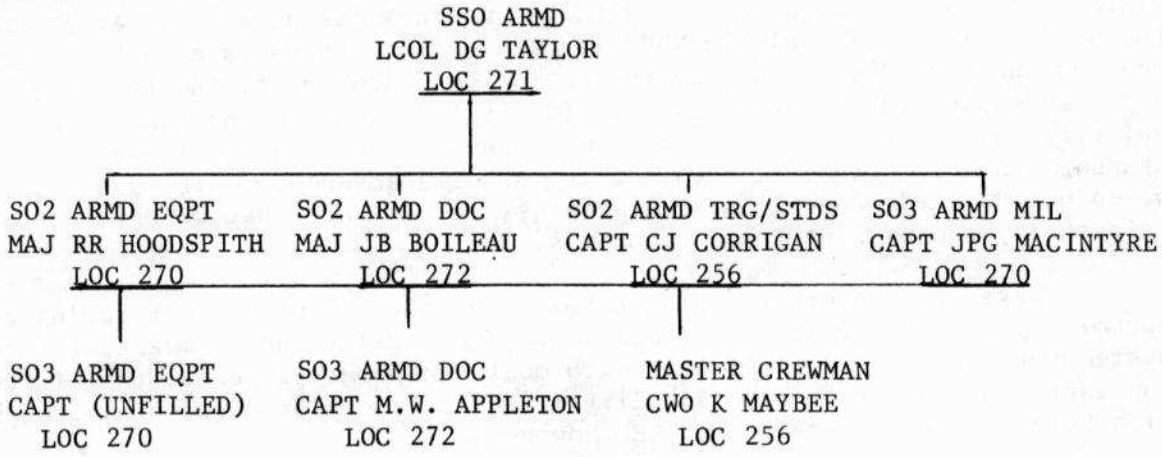
WHO SAID YOU CAN'T HAVE A BAD DAY ??

ARMOUR SHOP - FMC HQ

In 1981, the staff of the "Armour Shop" in FMC HQ changed over 100 percent. This article is therefore intended to acquaint the "field" with the current staff and a few of our major projects. It is not my intention to give you a long, complicated list of terms of reference; suffice it to say that we are an extension of the Director of Armour's office and are fully integrated into the FMC HQ functional staff as shown here:



Our current manning and organization is:



Without a doubt, our major project, present and future, is "Armour 81-85". Published in Sep 81, many of you by now will have had an opportunity to read this appreciation. It represents the collective wisdom of the Corps and is our shopping list for the next few years. The staff action table at the rear of this document covers some 83 separate actions to be undertaken. We, and the many designated OPIs, are well on our way to actioning this extensive list. Now a few words from each of the functional cells.

EQUIPMENT

SO Armd Eqpt is responsible for many different equipments and vehicles, both inside and outside of the Corps. A Capt SO3 Armd Eqpt position exists but is unfilled at this time.

Equipment is undergoing a great deal of scrutiny throughout FMC, with unit holdings being reviewed by an Equipment Review Board. The objective is to re-distribute scarce holdings where they are most required. Needless to say, the Corps has received its share of scrutiny, and it is safe to say we will be giving up some equipments of all types. However, units have now had some input into the process through their brigades, and objections to the proposal will be resolved prior to implementation. The final decisions on this review are of vital interest to the Corps, as they will affect training and operational preparedness.

There are several initiatives being pursued in the area of new equipment acquisition. First priority is obtaining a state-of-the-art target system for our ranges at the Armour School, Valcartier, Meaford and Wainwright. This system should have a hit indicator capability, hostile fire simulation, and a pop-up and mover sub-system. The mover must not be restricted to rails or pulleys, but be capable of lateral and head-on movement and be remote controlled. Two existing systems meet the majority of these requirements, the DIXI and the ABA FAST, with the latter being the most advanced. At present, the project is stalled within NDHQ largely because there is a lack of agreement on who should be lead directorate in its procurement, and there is a lack of consensus as to its priority. It is difficult to convince anyone of the priority this system deserves, when we cannot relate the requirement to a standard that is not being attained through its absence. This is because we do not have adequate gunnery standards. It appears that we may not obtain the system without these standards.

There are two other items that will be pursued with vigor during the upcoming year. These are a thermal imagery capability and a muzzle reference system for our Leopard fleet. As with most equipment projects, the limiting factor appears to be availability of funds. Both of these projects are also being actively pursued by DLR however.

DOCTRINE

SO Armd Doc's main responsibility is the production and amendment of armoured manuals. These consist of 15 tactical, gunnery, equipment and environmental publications as follows:

1. The Armoured Reconnaissance Brigade in Battle.

2. Desert Operations.

3. A Soldier's Guide to the Desert.

4. The Armoured Regiment in Battle.

5. The Reconnaissance Squadron in Battle.

6. The Tank Troop Leader's Manual.

7. The Reconnaissance Troop Leader's Manual.

8. The Reconnaissance Regiment in Battle.

9. The Theory of Armoured Gunnery Part 1 - General.

10. The Theory of Armoured Gunnery Part 2 - Leopard Application of Fire.

11. The Theory of Armoured Gunnery Part 3 - Cougar Application of Fire.

12. Armour Range Simulation Practices.

13. Armour Open Range Practices.

14. Night Vision Sets - Individual and Crew Served Weapons AN/PVS 502 and AN/TVS 502.

15. Radar AN/PPS 15(V) 2.

Four of the above manuals (Recce Bde and Regt, Desert Ops) remain to be written while the other 11 are in various stages of publication from interim to final edition.

The publication process is a very long one and consists of:

1. identification of a requirement.

2. author's writing plan.

3. preparation of draft edition for circulation and comment.

4. preparation of interim edition, incorporating comments received for further circulation and comment (if required).

5. preparation of additional interim editions (if required).

6. publication of final bilingual edition (green cover, flip format).

7. review every two years.

8. amendments issued based on biannual review or changes to tactics, organization, establishments, etc.

Two points should be noted with regard to this publication process: (1) The whole process takes well over two years from identification of requirement to final bilingual edition. (2) Draft and interim editions are normally only issued in English and a French version is usually not available until the final edition.

Another area in which armoured publications are required in user manuals for Armoured Corps vehicles - Leopard, Cougar and Lynx. In Oct 78, it was informally decided to combine user and technical information into one manual, a CFTO. The aim was to cut down on duplication of effort as well as keep the user abreast of latest technical changes. Unfortunately, the process does not seem to be working and, of the five CFTOs presently available, only one is in final edition and not in the best format for the user. This whole area is being pursued to return to the CFP format controlled by FMC HQ.

Also on the doctrine side, SO Armd Doc is responsible for the currency and correctness of doctrine taught at both Staff Colleges, the Armour School and the units. As such, he has direct liaison with these organizations.

Standardization, both NATO and ABCA, also fall into SO Armd Doc's area. This includes such things as review of NATO publications (AAPs, ATPs), STANAGs, QSTAGs and QWG Concept Papers. Interoperability is the name of the game these days and standardization with our NATO and ABCA allies goes a long way towards achieving it.

SO Armd Doc, along with SSO Armd, is a member of the Army Doctrine and Tactics Board Working Group which meets periodically and reviews doctrinal proposals for acceptance. Even purely armoured matters must be discussed in this forum if we wish to change our ways of doing something. The ADTB issues the Canadian Army Doctrine Bulletin which gives advance notice of doctrinal changes and is a medium for discussing new proposals.

On the non-doctrine side, SO Armd Doc has two main concerns. He is responsible for monitoring and maintaining armoured unit establishments, both Regular and Militia. This includes co-ordinating any annual manpower allocations to bring us in line with our peacetime establishment model approved by the Defence Services Review and preparation of ECPs.

Finally, SO Armd Doc is the combat arms representative on the TACCDAS Working Group. TACCDAS (Tactical Army Command and Control Data System) is a major sub-system of ACCS 85 (Army Command and Control System 1985-2000) and will provide automation assistance to the operation and intelligence functions of formations and units in the field.

A position exists for a Capt SO 3 Armd Doc. This position was originally at the FMC HQ Det at CTC but has been moved to FMC HQ. The position will be filled in Jan 82 and assigned the priority task of writing our vehicle user manuals in an acceptable format.

That, in a nutshell, is SO Armd Doc. If you have questions on status or distribution of publications, latest amendments, suggested changes, recommendations for new publications, establishments or any other doctrine or establishment related questions, don't hesitate to write or call him.

TRAINING/STANDARDS

The SO Armd Trg/Stds and CWO Master Crewman together deal with the day-to-day dynamics of Branch training and the long term management of the course training standards for all officer and crewman courses, both regular force and militia.

The SO Armd Trg/Stds is the Armoured Corps' FMC HQ representative in the Canadian Forces Individual Training System between the Armour School and CFTS HQ. During the past three to four years the production of course training standards, and companion course training plans by the School, has represented a considerable work effort as a result of Leopard and Cougar coming into service.

The 1980 CTC Course Review also resulted in CTS/CTP changes which have now been completed. A period of relative stability in regular force CTSs/CTPs should now exist for the next few years. Revision of militia CTSs remains to be done and is a project this fall. The on-going 'fine tuning' of all CTSs with the Armour School Standards Section continues as usual.

The following are other projects/activities that SO Armd Trg/Stds and the Master Crewman are either responsible for or have a collateral interest:

1. Cougar Gnry Competition - The 1982 Competition will be held in June 1982 in Meaford supported by the 8 CH. Militia crews from Cougar regiments have been invited to compete in all future competitions. This annual competition awards the Ram's Head Trophy to the Cougar regiment acquiring the highest aggregate score. Trophies are also awarded to the troop and squadron that acquire the highest aggregate scores.

2. Occupational Analysis - As a result of the 1980 CTC Course Review, it was recommended that an occupational analysis be done of each of the combat arms trades. No doubt by the time you read this you have either been interviewed or filled out a questionnaire. Its aim is to examine our present crewman trade structure and recomment changes for improvement.

3. Lateral Skill Progression/Rank Restructuring - An NDHQ VCDS directed study to examine refinements in both pay scales and rank to result in technical competence being recognized with pay. This

study is an attempt to remove some of the anomalies created during the integration/unification process of rank restructuring. Rank is a function of leadership ability but some CF trades award technical competence with rank as this is the only means at present of giving a member pay commensurate with technical ability. This is an on-going complicated study that will probably not result in change for a number of years.

4. Collective Training Standards - A Commander FMC directed project to write collective training standards for up to and including squadron/combat team. Until now whether or not collective training was or wasn't successful was based upon the subjective opinion of commanders at all levels, many of whom have had combat experience. As few, if any, present commanders, COs and trainers have combat experience, a project to write collective training standards as an aid to conducting collective training is considered to be essential.

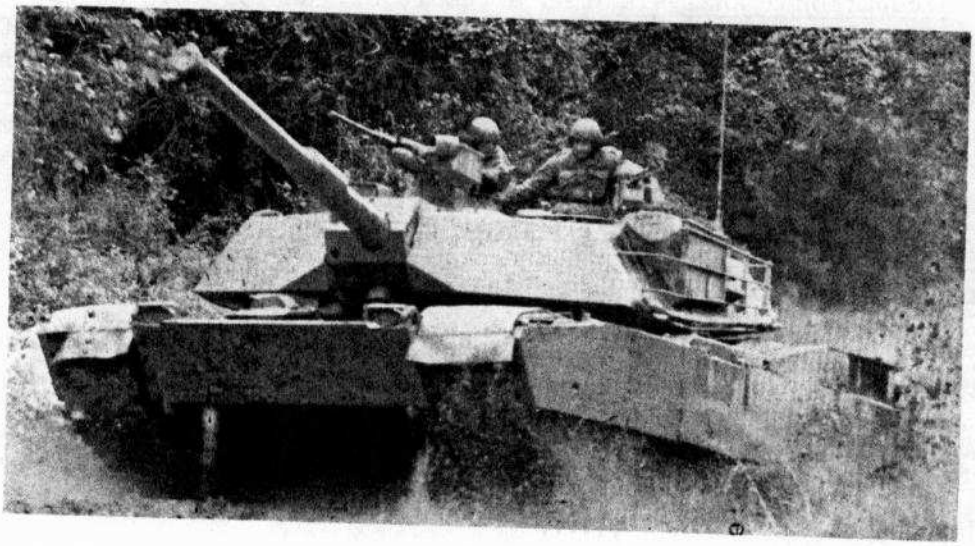
5. Forecasting course loading requirements for Armour School courses.

6. Rewriting Worthington Trophy Competition.

MILITIA

The main purpose of the SO Armd Mil is to provide Militia expertise to the equipment, doctrine and training/standards staffs. While he must respond to several masters, it is essential that we have this expertise as so few personnel have had practical day-to-day experience as RSS Officers. Militia requirements are totally integrated into the functional staff and the system seems to be working well. In fact, many of our top priority projects at this time concern Militia requirements.

That sums up the Armour Shop at FMC HQ. It exists as a part of the highest purely "Army" HQ in the Forces and, as such, is the critical link between formations/units and NDHQ. Our services are always available for day-to-day "fire-fighting" and long term considerations.



M-1 Abrams

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IDENTIFICATION des VEHICULES BLINDES

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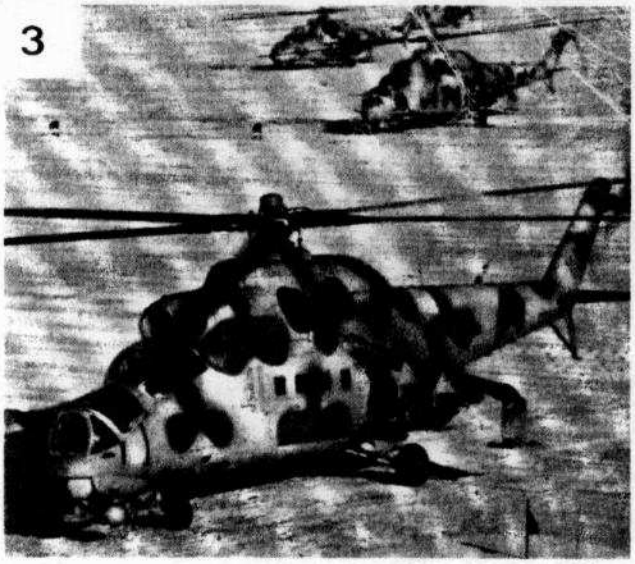

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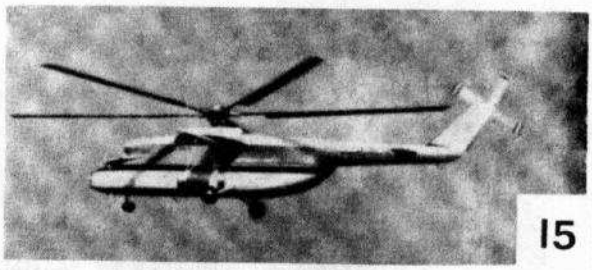

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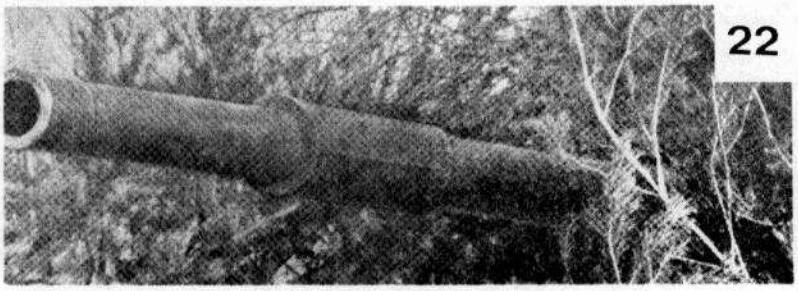
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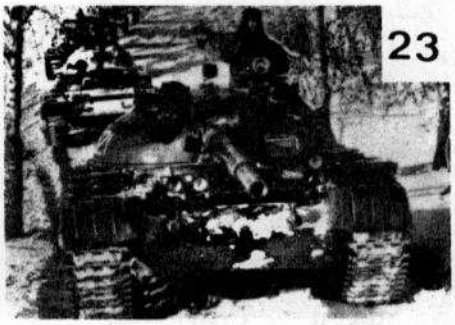
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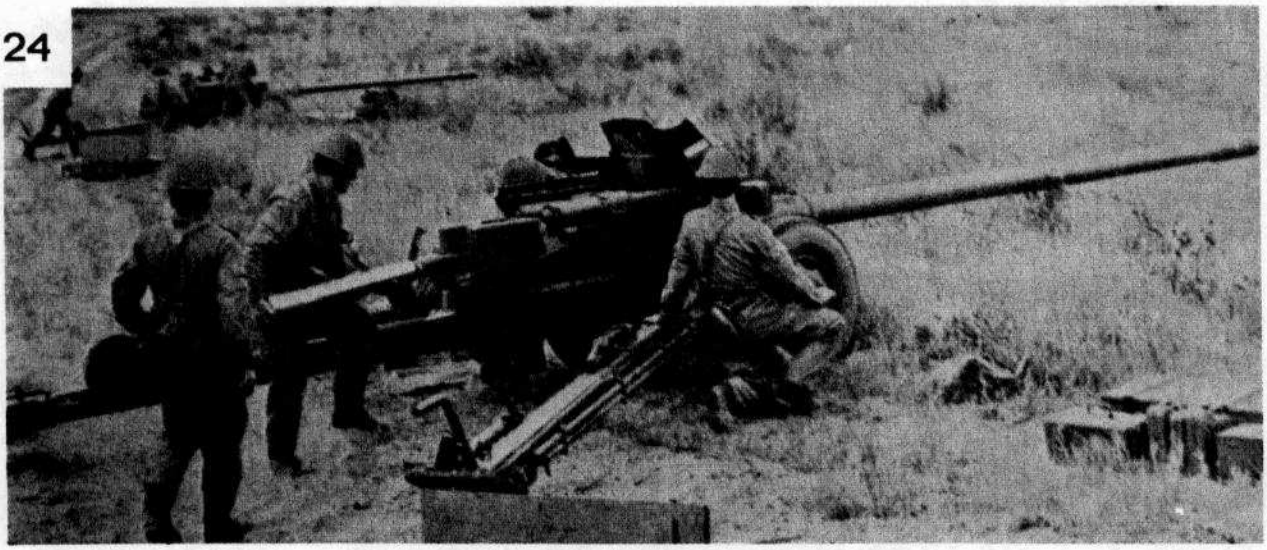
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FROM THE PAST

Editor's Note: The following article is a reprint from the RCAC Review, #2, April 1966. What it deals with is the first recorded efficiency report in the files of the War Department. It provides some interesting reading.

AUGUST 15, 1813

Lower Senaca Town
Aug. 15, 1813

Sir:

I forward a list of the officers of the 27th Regt. of Infty (British Regiment in the colonies - N.S.) arranged agreeably to rank. Annexed thereto you will find all the observations I deem necessary to make.

Respectfully,
I am, Sir,
Yo. Obt. Servt.

Lewis Cass
Brig. Gen.

27th Infantry Regiment

Alex Denniston - Lieut Col Comdg	- A good natured man.
Clarkson Crolins - First Major	- a good man, but no officer.
Jess D. Wadsworth - 2nd Major	- An excellent officer
Captain Christian Martel) " Aaron T. Crane) " Benj Wood) " Maxwell)	- All good officers
Captain Shotwell	- A man of whom all unite in speaking ill. A knave despised by all.
" Allen Reynolds	- An officer of capacity, but imprudent and a man of most violent passions.

Captain Danl. Warren Porter	- Stranger but little known in the regiment
First Lieut Jas Kerr) " " Thos Darling)	- Merely good, nothing promising.
First Lieut Wm Perrin) " " Danl. Scott) " " Jas I Ryan) " " Robt McElwrath)	- Low vulgar men, with the exception of Perrin, Irish and from the meanest walks of life, possessing nothing of the character of officers or gentlemen.
" " Robt P Rose	- Willing enough - has much to learn - with small capacity.
" " Hall	- Not joined the regiment
2nd Lieut Nicholas G. Garner	- A good officer but drinks hard and disgraces himself and the service.
" " Stewart Elder	- An ignorant unoffending Irishman
" " McConkey	- Raised from the ranks, ignorant, vulgar and incompetent
" " Piercy) " " Jacob J. Brown) " " Thos G. Spicer) " " Oliver Vance)	- Came from the ranks, but all behave well and promise to make excellent officers.
" " James Garry	- A stranger in the Regiment.
Third Lieut Royal Geer) " " Mears) " " Clifford) " " Crawford) " " McKeen)	- All Irish, promoted from the ranks, low vulgar men, without one qualification to recommend them, more fit to carry the hod than the epaulette.
" " John G. Scholtz) " " Francis T. Wheeler)	- Promoted from the ranks, behave well and will make good officers.
" " Darrow	- Just joined the regiment - of fine appearance.
Ensign Behan	- The very dreg of the earth, unfit for anything under heaven, God knows how the poor thing got appointed.

Ensign John Brown)
" Bryan

- Promoted from the ranks - men of no manner and no promise.

" Charles West

- From the ranks, a good young man who does well.

Leopard C-1

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A CONFERENCE OF SOME NOTE

Editor's Note: The following are extracts from an article that was previously printed in an issue of The Royal Canadian Armour Corps Journal. Although dated, it provides us with some interesting views from professionals who experienced combat while leading armoured troops. Few of us today who wish to "re-invent the wheel" can make the same claim.

On 3 January 1946 a Conference was convened at Headquarters "E" Group, Canadian Reinforcements Units, by Brigadier T.J. Rutherford, C.B.E., E.D., Senior Advisor, Royal Canadian Armoured Corps (United Kingdom). During the first week in January 1946 there were on the strength of C.R.U., twenty-eight Royal Canadian Armoured Corps Officers of the rank of Lieutenant-Colonel and above who had commanded either field units or training units of the Corps in the United Kingdom, North West Europe, Sicily and Italy and North Africa during W.W. II. Brigadier Rutherford, realizing that probably never again would so many senior Corps Officers experienced in armour be available in one place at one time, decided to convene a Conference where the views and experiences of these Officers could be obtained for future use.

QUESTION

Put down what you consider the principal tactical lessons of the war, having to do with the employment of armour under the following headings, or such other headings as you may desire:

(1) Recce role
(2) In support of Infantry
(3) Independent of Infantry
(4) Tank-Artillery cooperation.

ANSWERS - comments were as follows:

21 CDN ARMD REGT (The Governor General's Foot Guards)

(1) Require better liaison
(2) Requires mass tactics
(3) Useful, easy and successful.

6 CDN ARMD REGT (1st Hussars)

(1) Tanks used in a recce role should be equipped with the very latest types of smoke dischargers and crews trained to appreciate the value of smoke.
(2) Infantry and Armour should know more of each other's capabilities and tactics as in the past misunderstandings have taken place and many lives lost due to the lack of this knowledge.
(3) Tanks can hold ground during the daylight but must be relieved or reinforced by Infantry towards darkness. Tanks alone can break through any defence if weight of numbers are available and the situation warrants the casualties that are bound to be suffered.
(4) Toward the latter part of the war there was far too much talk about indirect shoots. Many of the Artillery were figuring they were going to be relieved of some of their tasks and responsibilities.

1 CDN ARMD REGT (The Royal Canadian Dragoons)

(1) Disorganizing and breaking down the enemy's morale after a breakthrough has been obtained, e.g., the breakthrough in Friesland.
(2) Catching up and harassing a retiring enemy.
(3) Flank protection.
(4) Liaison between two advancing formations.

22 CDN ARMD REGT (The Canadian Grenadier Guards)

(1) In a straight recce role - consider carriers just as good as they are faster, more manoeuvrable, smaller track pressure, can see more, are lower and personnel are NOT so likely to forget that they can dismount from the vehicle. However, as Recce was employed on flanks and for fire support a tank of Chaffee type is NOT only desirable but necessary.
(2) In support of Infantry must be the normal employment of tanks.
(3) Used independent of Infantry only if on a mass attack by tanks on a breakthrough such as operation tractable.
(4) Tanks have excellent indirect fire weapon.

HQ SQN 5 CDN ARMD DIV

(1) Tanks definitely give a great morale support to the Infantry.

3 CDN RECCE REGT (The Governor General's Horse Guards)

(1) Tank personnel must be prepared to dismount and do recce on foot.
(2) They must also be prepared to fight on foot. It took a great deal of training and actual fighting experience to achieve the above.

CDN DS STAFF COLLEGE (Camberley)

(1) Must be well in front to allow manoeuvrability of main force.
(2) Too broad a subject to be discussed here.
(3) Must attack in strength with large proportion of tanks going in together.
(4) All tank commanders must be qualified forward observation officers.

6 CDN ARMD REGT (1st Hussars)

(1) Recce personnel must be highly trained in the use of smoke.
(2) A close understanding between Infantry and Armour is necessary. Each should know the other's capabilities and limitations.
(3) It is possible for tanks to hold ground in daylight but it should be understood that they must be reinforced or relieved by Infantry after dark. The exercises of August 8th

and August 14th proved that tanks alone are capable of breaking through almost any defence. Although casualties were high this must be expected in operations of this type.

(4) Tanks must NOT be expected to answer the role of Artillery as happened in the latter stages of the war.

29 CDN ARMD RECCE REGT (The South Alberta Regiment)

(1) Any Armoured Regiment with training can do the recce role for a Division.

(2) A Battalion of Infantry working with a squadron of tanks is the ideal combination.

(3) Fire and movement principles is still the prime tactical factor.

(4) Every crew commander should be trained as a FOO.

10 CDN ARMD REGT (The Fort Garry Horse)

This is properly the fit subject to an essay in itself. Generalities only can be mentioned.

(1) Armoured Corps and Infantry Division recce proved generally valuable. Training in recce for all armoured personnel is very important.

(2) This is the general basis of employment for tanks which proved their value time and again. The training of Infantry with tanks is vital.

(3) Tanks are never really independent. In some roles tanks are properly the predominant partner but Infantry support is always necessary. Thus the Armoured Division was either too short of Infantry to do a proper job or did NOT have enough tanks for a purely Armoured role. The first and second Canadian Armoured Brigades were more useful throughout.

(4) Artillery support is as valuable to tanks as it is to Infantry. On occasions tanks can thicken (NOT replace) proper Artillery tanks. Consider that Artillery should introduce heavy calibre tracked vehicles "Assault Artillery" to relieve tanks of some of their static tasks.

6 CDN ARMD REGT (1st Hussars)

(1) Fire and movement; communications.

(2) Close liaison and advanced training by both arms. Fire and movement. Avoid silhouetting and open positions. Simple plan.

(3) As above with the exception of simple plan.

(4) Liaison.

5 CDN ARMD REGT (8th Princess Louise's (New Brunswick Hussars))

(1) Information usually too slow in reaching following units. Detailed recce with Armour impossible.

(2) Close liaison in and out of battle is essential to create an efficient smooth working team. Each gets to know what the other requires and the response is almost automatic. Squadrons should always work with same Battalions if at all possible.

(3) Close liaison with and support from air and S/P Artillery is essential. Infantry should follow up Armoured advance as closely as possible in Armoured Personnel Carriers; otherwise much time is lost if Armour becomes stymied.

(4) Close liaison in and out of action is essential. During action a representative and FOO's from Artillery always with unit. All crew commanders to be trained as FOC's (they can frequently correct fire and bring it down when FOO's cannot get observation). In spite of tank succession Artillery roles, Artillery is still indispensable in the team. Quick follow-up and deployment of SP Artillery necessary in support of Armour. A leap frogging of batteries with one always on the ground ready to fire was found to be very successful.

10 CDN ARMD REGT (The Fort Garry Horse)

(1) NOT suitable for tanks.
(2) Excellent.
(3) Only on occasion when everything is right for a breakthrough and/or pursuit.

AMX-10 RC

WOMEN IN THE ARMOURED CORPS

By Capt J.L.C. Machabee
FMC HQ

Editor's Note: The following article has been in our files for some time. It has been included in this issue to stimulate some interest on a very "emotional" subject. Should you have any comments feel free to write to us for inclusion in future issue's "FEEDBACK" column.

Should servicewomen be employed in combat roles? More specifically, should women be employed in the crewman trade of the Armour Corps?

Following the recommendation of the Royal Commission on the Status of Women in 1971, the Minister of National Defence ordered a study made on the employment of women in the Canadian Armed Forces. The principle recommendation was that there can be no limitation in the employment of women in the Forces except in primary combat roles, sea duties, and isolation postings. Furthermore, the Act of Human Rights proclaimed on 1 Mar 78 gave women a strong support in their efforts to accede to all positions in the Forces including combat duties. Although servicewomen have proven themselves very capable in many trades, combat duties which demand great physical strength, stress and endurance should be excluded to women.

Recently, there have been many discussions amongst crewmen as to the employment of women in the Corps. How well could they perform in the different crew positions? There is no doubt that the majority of women could learn to drive a tank. Whether they could perform effectively as a tank driver remains questionable. Besides driving the tank, the driver must perform various other functions which require a great amount of physical strength. For example, there are very few servicewomen who would be capable of replacing track pads, breaking track, or changing a shock absorber. With normal training they can become as accurate gunners as men, yet difficulties would be encountered with the cleaning of the main armament as this requires all crew members to take part. The removing and replacing of the breech block is the gunner's responsibility. Since it weighs 118 lbs and is very difficult to handle due to limited space, it appears doubtful that a woman could perform this task as required. As a loader, aside from operating the radio which they can do as well as men, the women would be required to load the gun; this involves lifting ammunition that weighs 43 to 58 lbs (depending on the type) and is very awkward to handle.

In battle, since speed could very well determine the success of an engagement, i.e. life or death, it is unlikely women could be placed in a crew position due to the many problems that would

be encountered. With the necessary knowledge and experience, the role of tank crew commander could probably be assumed by a woman. However, as a crew commander, one is required to share in the maintenance responsibilities with the crew such as changing tracks, cleaning the gun, etc. If, by the nature of the job required, a servicewoman in a crew commander's position is not capable of sharing responsibilities, it would mean more work for the rest of the crew and less of a "crew team" approach. This would have an adverse effect on the crew's spirit and performance.

Over 100 crewmen were asked if they were ready to accept women as a crew member of their tank. The survey showed that 25% favour women as a crew member on the battlefield; however, their reasons were more for physical attractions than practical reasons. After discussions, only 2% still favoured it. None of the persons questioned were willing to accept a woman as a crew commander in a combat situation.

Another serious negative reaction would probably come from the soldiers' wives as it is unlikely they would favour their husbands leaving for a long campaign knowing they would be fighting and living side by side with a woman. One can foresee possible complications occurring after a long period of time being separated from loved ones.

The modern woman, who claims equal rights and access to all categories of employment regardless of the type of job, will state examples such as women working with men in hospitals, supply depots, air traffic controllers, etc., but one must admit there is a big difference between working on base in a technical environment and living and fighting side by side on the battlefield.

In many trades such as administration, medical, dental, and air observer, to name a few, the employment of women is successful as they succeed to help create a high degree of efficiency and team work in their respective field. However, in the Armoured Corps, the employment of women would most likely disrupt the troop cohesion, productivity and efficiency. Consequently, it is the author's opinion that Canadian servicewomen should not be employed in the Armoured Corps.

Before accepting the servicewomen in the Armour Corps, an evaluation would have to take place for that particular function to ensure that candidates could perform all aspects of the job to the required standard, thus ensuring that men and women in the service share equal responsibilities and help maintain cohesion. Further studies are necessary to establish a definite requirement for the employment of women in combat duties both advantageous to the Forces and country.

TACTICAL MOBILITY FOR RAPID DEPLOYMENT FORCES: THE SOLUTION IS AT HAND

By Capt Richard A. Stewart, USMC

Editor's Note: The following article arrived on the editor's desk via an indirect route through CDLS Washington, DLR Ottawa and finally the Director of Armour, Ottawa. It is one view towards a solution for the problems facing the RDF role of the United States Army. It is a very topical article and your comments would be appreciated.

The recent Soviet invasion of Afghanistan highlighted our woefully inadequate ability to rapidly deploy forces capable of handling sudden crisis in remote areas such as the Persian Gulf region. Although the Department of Defence has undertaken a new program designed to develop a rapid deployment capability based on improved transport aircraft and prepositioned ships, the initial package of this program will not be ready until at least 1983. Events in the Middle East and elsewhere may not wait for the U.S. to prepare. Given the fixed constraints inherent with existing strategic transport capabilities, we must look for answers now to the problem of rapidly moving a combat force whose firepower and tactical mobility can match that of a potential threat.

To seek a solution, we should first determine the requirements which must be met by the combat spearhead of a rapid deployment force. Let us assume a plausible, and logical, Middle Eastern scenario in which a mechanized multi-brigade aggressor force invades Saudi Arabia near its border with Yemen. There is no advance warning of the crisis and the bulk of the Saudi forces deployed near the frontier are engaged in combat with the invaders within seventy-two hours of the incursion.

Several key requirements are immediately evident:

1. U.S. Forces must reinforce Saudi forces as rapidly as possible to prevent a Saudi defeat or debacle and to demonstrate U.S. determination.

2. The U.S. Force should, ideally, be capable of reaching the remote battle zone within five days of the invasion if a serious Saudi setback is to be averted.

3. At least one mobile combat brigade will be required, initially, to stem an attack. Follow-on forces amounting to as many as several divisions could be introduced in the weeks that follow.

4. To meet the time factor stated, the brigade and its support equipment must be capable of being transported in a single lift by existing airlift assets (assuming intermediate refueling bases are available).

5. Tactical air requirements could initially be satisfied by carrier-based naval air or regionally based capabilities (should, for example, the U.S. decide to use the Sinai airfields recently offered by the Egyptians). This would facilitate greater availability of immediate airlift for ground forces.

6. Saudi airfield and port facilities, such as Jidda, can be located as far as five hundred miles from frontier combat zones. This necessitates that the brigade have the capability of moving hundreds of miles from debarkation points to rapidly reach combat areas. Vehicle maintenance and troop fatigue must be minimized to preserve combat effectiveness.

7. Upon arriving in the combat zone, the brigade must have a reasonably balanced combined arms capability (i.e. anti-tank, anti-air, artillery, engineers, infantry, etc.) to provide effective firepower against the type of threat encountered.

8. The brigade's combat vehicles must possess adequate armor to prevent them from becoming "soft" targets to enemy fire. The brigade must also have sufficient tactical mobility to operate in marginal terrain.

Undoubtedly there are many who would say that, although the above requirements are valid, they would be impossible to satisfy even with existing capabilities. It is true that the U.S. military does not currently possess the requisite capabilities, but such capabilities do exist and could be easily and even relatively cheaply acquired.

In their recent article, "The Light Armored Corps-- A Strategic Necessity", Generals Hollingsworth and Wood indicated that the ideal answer to the problem of mobility and firepower for a rapid deployment force lies in the creation of a family of lightweight armored vehicles which can be easily airlifted (as the Soviets currently do with their BRDM's, BMD's, and ASU-85's) to remote trouble spots. This family could also be heli-lifted by the CH-53E to provide tactical flexibility and surprise. The authors indicated the Marine Corps development of a Mobile Protected Weapons System (MPWS) as typifying the type of vehicle required.

The MPWS was originally conceived as a sixteen ton, tracked, lightly armored platform mounting an anti-tank weapon such as the new high velocity 75mm gun currently under development. The vehicle's primary purpose was as an infantry support weapon and, as such, could only marginally address the rapid deployment mobility problem.

The various revolutionary design features envisioned for the MPWS have resulted in a projected initial operational capability of at least the late 1980's. Spurred by the immediate need for such a capability, the Marine Corps has been studying and testing existing alternatives which could generally satisfy the MPWS requirement until a more sophisticated vehicle is ready. Driven by weight constraints, Marine Corps efforts have inevitably focused on the examination of lightweight wheeled armored vehicles.

These vehicles, which exist in many varieties and configurations, may present the best immediate, if not long term, answer to the tactical mobility problem associated with rapid deployment. The tactical mobility of these vehicles is essentially equal, and in many respects superior, to that of tracked vehicles. During the recent Marine Corps Mobile/Mechanized Assault Test held in March, 1979 at Twentynine Palms, California, two Cadillac Gage 4X4 V-150 "Commando" vehicles were tested as to their compatability with tracked vehicles such as tanks and LVT's. The results were impressive. The vehicles proved capable of traversing terrain inaccessible to their tracked counterparts. Although there were cases where, when employed tactically, the vehicles lagged behind the tanks in rugged terrain, this was viewed more as a function of using only a 4X4 vehicle rather than the more mobile 6X6 versions. The maintenance and reliability record of the vehicles was highly praised by the participants. Shortly after this test, the Marine Corps invited the Canadian Army to demonstrate their wheeled 6X6 Grizzly armored personnel carrier (APC) and Cougar anti-armor vehicle. The demonstration was held at the Marine Corps Development Center in Quantico, Virginia and the results, again, were positive. Both vehicles were driven tactically through rugged terrain, heli-lifted by the CH-53E, and taken to the Potomac River where they demonstrated their amphibious capabilities. As a result of the demonstration, the Marine Corps has contracted with the Canadian government to lease six of these vehicles (which are produced in Canada under license from Swiss MOWAG) in order to test MPWS concepts at Twentynine Palms. This testing does not necessarily mean that the Marine Corps intends to procure this type of vehicle, but the Director of the Marine Corps Development Center, Brigadier General Al Gray, has repeatedly stated that wheeled armor is under definite consideration as an MPWS short term alternative.

There are a number of reasons why wheeled armored vehicles would provide the ideal answer to the rapid deployment dilemma. The vehicles meet the space and weight requirements for both strategic airlift and helicopter transportability. The Commando V-150 is only eight tons and the MOWAG vehicles can be produced at under ten tons. In computing the load factors for moving the 6 MOWAG vehicles almost 4,000 miles from Canada to California, it was discovered that a C-141 can transport three vehicles while a C-5A can transport six. This fact would significantly limit the number of transports required to rapidly deploy a brigade in a crisis.

Virtually all current wheeled armored vehicles possess armored protection against 7.62mm machinegun fire (or equal to that of the M-113 APC). Newer models are being produced with additional protection in key areas, such as the frontal presentation, against 14.7mm fire, thus providing survivability comparable to that of the Army's new Infantry Fighting Vehicle (IFV), the XM-2.

There are some skeptics who believe that the vehicle wheels are too vulnerable to be employed in a combat role. All current vehicles are being produced with combat run-flat tires to ensure mobility. To test the ability of these tires, the Canadian Army recently conducted an experiment in which they shot out the key tires on a MOWAG vehicle and then ran the vehicle continuously, under simulated combat conditions, through rugged terrain. The vehicle's tactical mobility was unimpeded and it travelled more than fifty miles before the wear on the damaged tires became excessive. Similar damage on a tracked vehicle would be disabling.

An important factor that favors wheels over tracks, particularly in a rapid deployment scenario, is the inherent ability of wheeled vehicles to traverse long distances in short periods of time. When travelling on a road, these vehicles function the same as trucks. In fact, some wheeled armored vehicles have attained road speeds of 70 mph. Tracked vehicles, on the other hand, are designed for traversing marginal terrain and can not be driven long distances at sustained speeds without incurring excessive wear and inviting mechanical failure. During the Marine Corps mobile/mechanized assault test, five days were required to move a predominantly tracked vehicle force a distance of one hundred and twenty miles. Although these vehicles could have travelled this distance much faster, the regular maintenance stops and large logistics train required to support the force was a limiting factor. Wheeled armored vehicles, free of most of the maintenance and many of the logistic burdens, could have traversed the same distance in a matter of hours.

Even when travelling on roads, tracked vehicles can produce fatiguing strains on crews and passengers. In wheeled armored vehicles, where suspensions are designed for both on-road and off-road travel, crews and passengers can journey long distances and arrive at their destinations without excessive fatigue.

If we were to look again at the Saudi Arabian scenario originally presented, we can see that an all-wheeled armored force could probably travel the five hundred mile distance from Midda to the frontier battle area, using Saudi roads and with regular rest stops, within fortyeight hours after debarkation. The troops would not be overly fatigued on arrival either. A tracked vehicle force, on the other hand, could require a week or more to travel the same distance. The maintenance condition of the vehicles and troop readiness on arrival might be less than adequate.

A major advantage associated with many wheeled armored vehicle families is the ability to produce prolific vehicle configurations designed for almost any purpose. Vehicle types can include infantry fighting vehicles with 26mm or 35mm automatic guns, anti-tank missile platforms, anti-armor vehicles with 75mm, 90mm or 105mm guns, anti-air vehicles with radar guided guns or missiles, mortar carriers, ambulances, and logistics vehicles. The West German Army, for example, employs these vehicles for engineer assault and electronic warfare. The development in Europe of a 105mm fire support vehicle has now made it tecnically possible to produce an all-wheeled self propelled artillery piece. Until such a vehicle is ready, a wheeled force can still rely on conventional towed artillery.

Wheeled armored vehicles also have an important cost advantage and extended life cycle compared to tanks. A recent French study, based on the VAB wheeled armored family, indicated that there is a savings of at least 40% when procuring a wheeled vehicle over a tracked vehicle. Cadillac Gage recently estimated the base price of their V-150 at about $100,000 or one third the cost of a new tracked IFV and twice the cost of a 5 ton truck. Wheeled vehicles are estimated to have life cycles three times that of tracked vehicles (as perhaps evidenced by the twenty year old Soviet BTR-60 which continues as the primary Soviet troop carrier). Life cycle costs for a wheeled armored vehicle are low, approximately the same as for a truck. It is also estimated that wheeled armored vehicles consume 40% less fuel than tracked vehicles. This savings can provide some of these vehicles with operating ranges of up to five hundred miles.

Since 1970 there has been a worldwide boom in the production and sale of wheeled armored vehicles. The Soviets were perhaps the first to expand beyond the escort and reconnaissance roles traditionally associated with these vehicles and produce multi-purpose wheeled combat vehicles such as the BRDM, SA-9 and BTR-60. Two thirds of Soviet motorized infantry and all Soviet marines are currently transported in these vehicles. Increasing technology made it possible to produce inexpensive wheeled armored vehicles with capabilities comparable to their tracked counter parts. This provided an economical answer in many countries to the problem of maintaining a mobile fighting force. Virtually every major European country, and some outside of Europe, currently produce a wheeled armored family. More than seventy nations employ wheeled armor extensively including several that have eschewed tracked vehicles altogether.

The Saudi Arabian National Guard recently modernized four of its battalions with the V-150. Each battalion is a self-contained combined arms team equipped with various combat configured vehicles. The Saudi Army also possess several companies of Panhard AML-90 wheeled anti-armor vehicles. The Canadian Army has enjoyed such success with its MOWAG family that there have been serious proposals that it replace the aging M-113 APC's in its NATO brigade with improved MOWAG vehicles. Even South Korea, which has traditionally relied on U.S. equipment and doctrine, has created a brigade equipped with the Italian FIAT 6614 wheeled APC which played an important and visible role in the recent turmoil in that country.

There are arguments that the lightly armored wheeled vehicles would be outmatched by heavily armored tanks such as the T-62. While there is a degree of validity to that point, it must be understood that the primary purpose of rapid deployment is to place mobile fighting units in combat zones as quickly as possible to prevent the collapse of host country forces. The rapid deployment of tanks, such as the M-60 or XM-1, is impossible because of the limited number of C5A's that can carry them. It might also require days for these tanks to reach a combat zone once they have debarked. Moving tanks by amphibious shipping in an unexpected crisis situation presents similar, if not compounded, problems. However, wheeled armored vehicles equipped with effective anti-tank weapons such as the TOW missile or an anti-tank gun, can perform well against enemy tanks. In the 1973 Yom Kippur War, one of the most successful anti-tank vehicles was the Soviet-built AT-3 (with Swatter missiles) using a wheeled BRDM chassis. The Middle East, with its clear weather and open desert, provides an ideal environment for the employment of anti-tank guided missiles, thus placing tanks at a disadvantage.

If the U.S. Army and Marine Corps were to create several brigades of wheeled armored vehicles, it would significantly enhance our rapid deployment capabilities. A brigade consisting of approximately 200 vehicles could be transported to the Middle East in less than 70 C-141 aircraft. Troops, supplies, and support vehicles could be transported on remaining available C-141 or C-5A transports or on civilian wide body transports. Based on existing capabilities, it should be possible to airlift a combat-ready brigade to the Middle East within three days. Upon reaching the debarkation point, the vehicles could be rapidly off-loaded and fueled. The brigade could then be quickly organized, distribute supplies and ammunition, and then depart to the combat area in order to arrive within fortyeight hours of debarkation.

One concept that has been advanced to enhance the short run staying power of such a brigade (until follow-on forces arrive), is to create a completely homogenous unit of wheeled armored vehicles to include vehicles that can be used as both combat troop carriers and logistics transport. In this way a portion of the force could be loaded with supplies such as ammunition, spare parts, and food. As the supplies in these vehicles are consumed, the vehicles would become available as combat carriers capable of replacing other vehicles that may be disabled or lost in combat. In this manner, the force can maintain a relatively stable fighting strength for a projected period of time pending the arrival of follow-on reinforcements.

The wheeled armored concept also has an important application to the prepositioned ship concept. The prepositioned ship concept calls for placing five special logistics ships which are designed for the roll-on/roll-off of vehicles near a potential crisis area. These ships would be loaded with the heavy equipment and rolling stock of a Marine brigade, (such as tanks, LVT's, artillery, trucks, etc.) When a crisis occurs, these ships would be deployed to a port near the crisis area where lightly equipped troops transported by air would meet the ships, off-load the equipment, and move to the battle area. A problem associated with this concept is that of maintaining complex equipment such as tanks and LVT's in proper running order. If a number of these vehicles should be inoperable when the time comes to unload, the brigade's combat readiness could be seriously impaired. The use of wheeled armored vehicles, which are more reliable and

easier to maintain, would minimize this problem.

Another problem with the prepositioned concept is that of long distances to the battle area. Once troops have unloaded their equipment, they may have to travel hundreds of miles to reach frontier combat zones. Although wheeled armored vehicles could make long road marches with relative ease, heavy vehicles such as tanks or LVT's travelling the same distance would create logistical burdens and excessive time delays.

For many reasons wheeled armored fighting vehicles provide the best immediate, if not long term, solution to the problem of rapidly deploying tactically mobile combat forces to remote crisis areas. The types of vehicles required are available now and already under production in the U.S. and Europe. Once a vehicle type has been chosen and preliminaries completed, the initial vehicles necessary to outfit a rapid deployment force could be produced in a matter of months.

The recent Soviet-invasion of Afghanistan, the Soviet-backed attack by South Yemen on North Yemen, and the reported large scale Soviet airlift exercise to South Yemen and Ethiopia indicate that there is precious little time remaining before U.S. interests in areas such as the Persian Gulf are directly threatened. We can not afford to wait years for new capabilities to be developed. There is a potentially viable solution available now among the various wheeled armored vehicle families produced by Western nations. This alternative deserves immediate investigation as a possible answer to the problem of providing rapid deployment forces with adequate tactical mobility and firepower.

MAKING A GOOD TRAINING AID BETTER

By: The RCD (Lahr)

The concept of an Indoor Miniature Range (IMR) is not new to the Corps. It provides crewmen with the ability to exercise their gunnery skills under simulation. Every Canadian Armoured Regiment has or has had one. In principle they are all alike. The only factors that distinguish one from another are the amount of cash devoted to the project and, most importantly, the ingenuity of the designers.

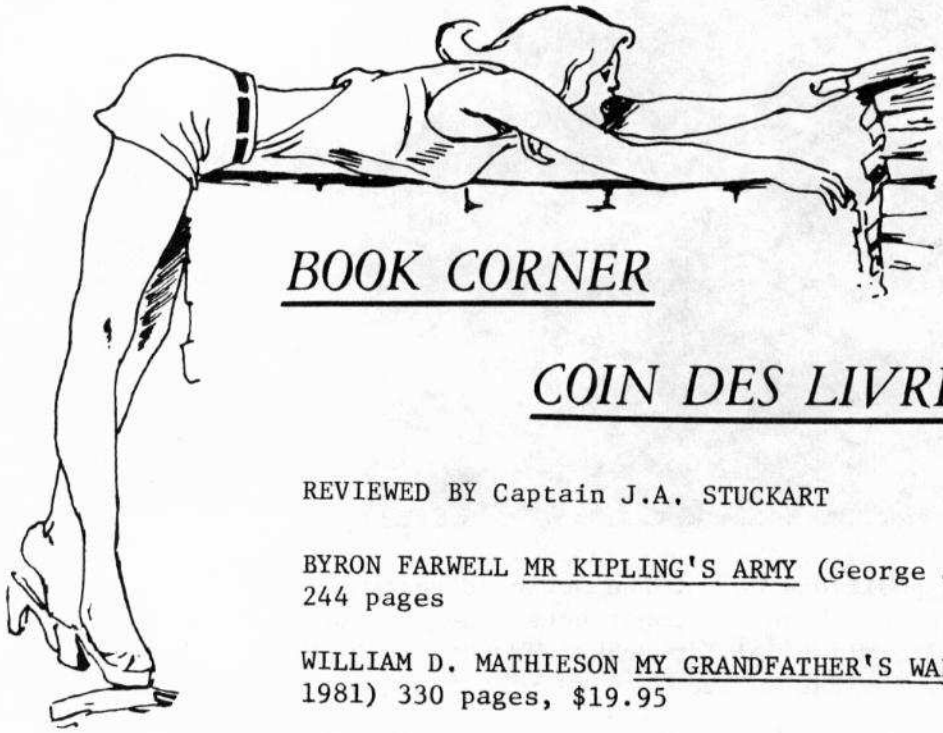
Up until the end of 1980, the IMR of The Royal Canadian Dragoons at Lahr, West Germany was in direct violation of one of the most basic principles known to soldiering; that is, to be both realistic and fun. A trip to the IMR in those days meant facing unrealistic terrain, poor lighting and uncomfortable temperatures during the winter months. In December of 1980, at one of the Commanding Officer's weekly conferences the problem was addressed. The solution, allocation of sufficient funds and the pooling of the expertise within the regiment.

With the help of the Fire Control Systems Technicians, drivers of the regiment and the gunnery WO, the project started to take shape. Targets were manufactured and set in the range lay-out at pre-determined locations, then a master control panel was wired in to operate targets so they would pop up. In addition, a wide variety of moving targets were incorporated into the design. This, of course, was not done without a few obstacles which had to be resolved. Various members of the Regiment built models to scale consisting of farms, gravel pits, people, parks, lakes, villages, hills, etc. These were then brought to the IMR for placement on the range and "WOW" what a playground.

Now, place a crewman in the gunners seat of one of the two tanks always available in the IMR and scan, what you'll see is a whole new concept in miniature ranges. The playground is now alive and you feel as if you are actually surveying the German country side. It's a surprise to realize this all appears through the sights of a Leopard C1 tank located in a stationary position within a building. A person can now appreciate the work that has gone into this project.

This 32' x 32' playground when completed with night flares, indirect lighting and multiple target presentations will enable tank crews to be trained in all phases of gunnery without the cost of main gun ammunition. The rewards are threefold. Firstly, the principle of soldiering being fun has been met. Secondly, maximum use of every live round allocated for annual firing can be achieved; and lastly, we are now better qualified to fight with our equipment should the need arise.

Tpr Pat Lafleur positions one of the moving targets under the watchful eyes of those who constructed the bulk of the IMR. From left to right Cpl Tim Hobbs, MWO Roy Lynk, Cpl Michel Lachance, Tpr Pat Lafleur and WO Ed Bates.



BOOK CORNER

COIN DES LIVRES

REVIEWED BY Captain J.A. STUCKART

BYRON FARWELL MR KIPLING'S ARMY (George J. McLeod Limited, 1981) 244 pages

WILLIAM D. MATHIESON MY GRANDFATHER'S WAR (MacMillan of Canada, 1981) 330 pages, $19.95

MICHAEL CARVER WAR SINCE 1945 (G.P. Putnam's Sons, New York, 1981) 304 pages, $14.50

As always, this issue of the Bulletin contains its share of "military" books for review. The three listed above will provide some light-hearted yet worthwhile reading for the military historian and would be welcomed additions to their libraries. All three have been released this year and are available in both book clubs and the many book shops around. Probably the most important factor this year is that they are reasonably priced considering the wealth of information they contain.

MR. KIPLING'S ARMY is a detailed account by Farwell of the life and times of Britain's Victorian - Edwardian Army. The book deals with the idiosyncracies and eccentricites of the British soldier during this "era of peace". The numerous colonial conflicts that did occur were opportunities for adventure, decorations and made for great storytelling. It was the era in which Britain reached her peak as a "colonial overlord" and she maintained her empire with the smallest army of any major power at the time.

Many aspects of military life are explored. The regimental system, customs, character and possessions are but a few of the topics discussed. Although there were distinct class separations and as a result, rank implications (i.e. officers - upper class; men - middle/lower class), both had similar diversions; food, drink and women. Both had their share of heroes and cowards. Each regiment had its own distinctive uniform and prided itself on its uniquesness.

All in all, it is a most enjoying book to read and one which I would recommend to all. It also holds a few surprises for those officers new to the regiments as it explains many traditions and customs still practised within the regimental system of the Army today.

MY GRANDFATHER'S WAR by Mathieson is written in a far different vein. It is a moving, oral history as seen by Canadian veterans of the First World War. The book is the end result of a three year odyssey by Mathieson across Canada and Europe, meeting with veterans of the campaigns of 1914-1918. It is a most personalized account of those years seen through many, many eyes.

Some of the information is from libraries and public archives but most is from the many interviews done. We get a glimpse of personal diaries, letters, journals and photo albums, treasured by these individuals who lost their innocence in four of the grimmest years of their lives. Included are the heroes, the cowards, the fears, the hopes, the comradeship, the jokes and the amusing anecdotes that kept them going. The book's style is far different than most you'll have read on WWI but that is what makes it so intriguing. It also helps conquer the fear of the author who said "one morning in 1989 or 1991, we might read that the last Canadian Veteran of 1914-1918 died and then it would be too late".

WAR SINCE 1945 is written by FIELD MARSHAL LORD CARVER, a most qualified individual to comment on the numerous conflicts since 1945. The book divides the conflicts into categories dealing with colonial conflicts (British & French), American, Indian and Pakistan and the Arab-Israeli Wars.

None of these conflicts was conventionally structured, and many were prolonged in their development. Carver develops the interplay of military and political events, much in the style of Hackett's THE THIRD WORLD WAR. The enemy was often hidden, the aim of the campaigns changed often as did the political leaders and success proved most difficult to determine for a success-starved world.

The era of anti-guerrilla warfare was well under-way while many military leaders prepared for conventional campaigns. Carver has demonstrated the importance of intelligence and information at all levels of command. As well, he indicates that quick action and determiniation of action were key elements in the more successful campaigns.

The book will undoubtedly be used as reference for many years to come and is a valuable aid to leaders at all levels. To quote the author, "History does not repeat itself, but it has much to teach us, especially about what not to do".

Reviewed by Captain J.M. Snell, CD

Richard Rohmer Patton's Gap (Don Mills: General Publishing, 1981) 240 pages, $16.95

Richard Rohmer! Reaction to this author's name is always Canadian; either love or hatred but no middle ground. To date among knowing Canadian critics (even if one includes the Globe & Mail's bookpage), Patton's Gap has not been entertained enthusiastically. Comparisons to David Irving's War Among the Generals has been both inevitable and unfavourable. This has been an unfortunate contrast as the intent of both volumes is not identical. This review, however, concerns itself only with Rohmer's work.

I liked the book. That is, I liked parts of it. At least, I didn't dislike it.

In fact, Patton's Gap is in actuality two separate endeavours - one autobiographical and the other historical narrative. At the beginning of each chapter, Rohmer sets the scene with an account of the actions of 430 Squadron, Royal Canadian Air Force. As a fighter recce pilot, he spent over a year in 1943-44 flying in support of the Allied Armies eventually involved in the Falaise Gap. These portions are highly entertaining and informative despite their lack of what we would term heroics. We share Rohmer's excitement over meeting Patton as well as his fears after a close encounter with the deadly German flak fire. As an addition to a rapidly expanding collection of Canadian war experiences, the revision of the personal recollections into a distinct volume would be a worthwhile effort.

Rohmer's main thrust, however, is to explain (uncover is perhaps more suitable) the cause for the creation of the misnamed "Patton's Gap". He depicts clearly the sequence of events commencing with the preparation to D-Day through to hard fought battle for Cain and onward to the activities of Patton's Third Army. His particular involvement generated from his inability to do anything after 430 Squadron spotted the large columns of fleeing Germans. He is especially irate over the "Army" decision to move the bombline. "As a gross error in tactical battlefield judgement the 17 August order moving the bombline east away from the overflowing pocket and Falaise Gap must qualify as one of the gravest in the utilization of assembled air power in World War II" (pg 207).

This book is not about good guys and bad guys. If, however, a good one is to be nominated, George Patton is obviously Rohmer's choice. The author's design is to clearly portray who was the father of the decision that led to the creation of the Falaise Gap. This he does in a logical and highly literate manner. Before his declaration on the final page, one is able to readily deduce the culprit.

The volume itself is easy and fun to read. In large face type, it is supported by more than adequate maps. However, the pictorial support leaves something to be desired. One can handle only so many pictures of jaunty Mustang pilots with flat hats and flowing scarves.

Overall, Patton's Gap is a worthwhile inclusion to the military history library. Hopefully Major General Rohmer will add his military autobiography to these shelves in the near future.

ANSWERS TO RECOGNITION TEST

1.	AMX 10 P	FRANCE
2.	SHIR II	U.K.
3.	HIND D (M1-24)	RUSSIA (WP)
4.	COBRA	U.S.A. (NATO)
5.	BMD	RUSSIA (WP)
6.	T-62	RUSSIA (WP)
7.	CHIEFTAN	U.K. (NATO)
8.	BMP	RUSSIA (WP)
9.	LYNX	U.K. (NATO)
10.	BTR-60 PB	RUSSIA (WP)
11.	HIP	RUSSIA (WP)
12.	ASV-85	RUSSIA (WP)
13.	CHIEFTAN	U.K. (NATO)
14.	LEOPARD I	GERMANY (NATO)
15.	HOOK	RUSSIA (WP)
16.	SCIMITAR	U.K. (NATO)
17.	T54/55	RUSSIA (WP)
18.	BRDM II	RUSSIA (WP)
19.	M 48A1	U.S.A. (SPAIN)
20.	M1973	RUSSIA (WP)
21.	SANKEY AT 105E APC	U.K.
22.	T-62	RUSSIA (WP)
23.	T-62	RUSSIA (WP)
24.	T-12 (ANT)	RUSSIA (WP)