



National  
Defence

Défense  
nationale

Canada



*General  
Armour Reserve Training  
Competition  
Leopard 2  
New Capabilities  
Our Allies*

# 2012 **ARMOUR BULLETIN**



National  
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Canada

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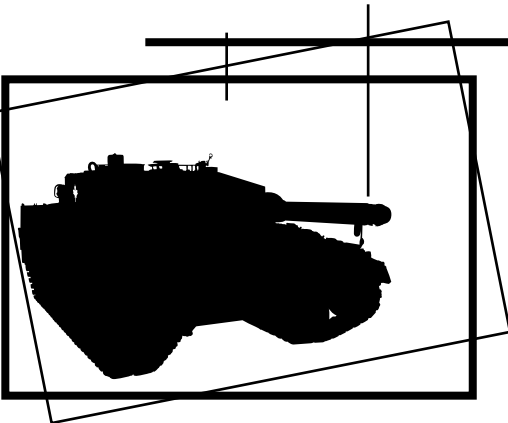
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#### **Vision Statement**

The Armour Bulletin is the official journal of the Royal Canadian Armour Corps. The mission of the Armour Bulletin is to annually publish unclassified, bilingual articles of professional interest, with a view to stimulating discussion.





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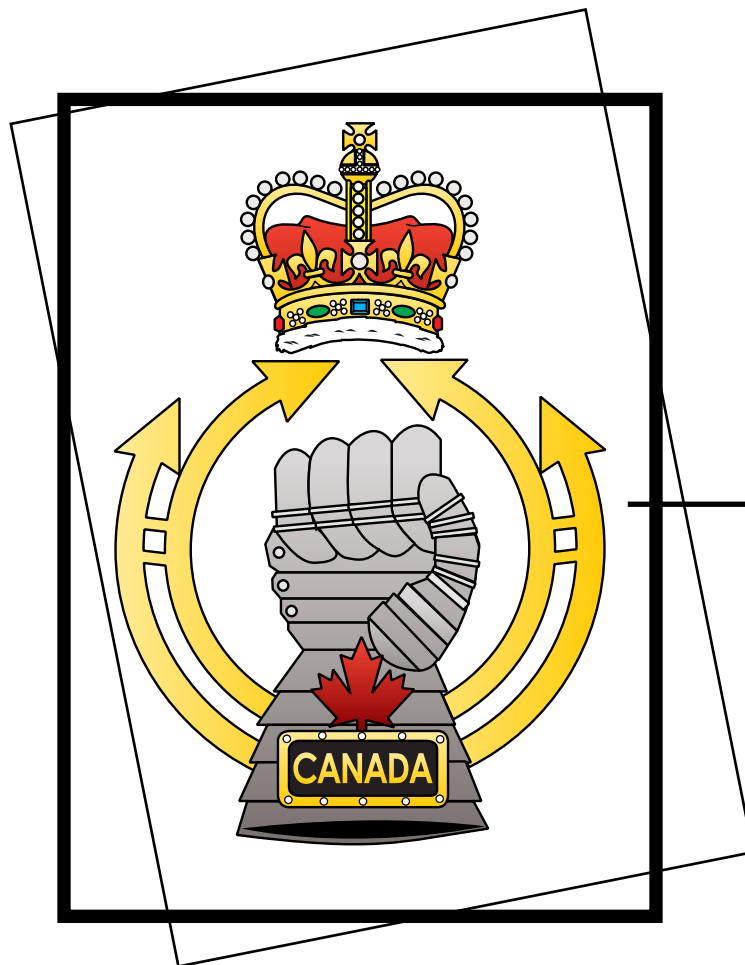
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# ARMOUR BULLETIN





**THE COLONEL  
COMMANDANT'S  
FORWARD**

I would like to commence this article by paying a special tribute to our past Colonel Commandant MGen CJ [Clive] Addy OMM OSTJ CD. General Clive has served our Corps long and loyally for over forty years. During his tenure as our Colonel Commandant he extended for an additional year to wait for others to become aligned in the succession plan. Our Corps owes him a debt of gratitude for his leadership and guidance during the many tours to our regular regiments and our militia counterparts, who greatly assisted in manning during operations in Afghanistan and the various peacekeeping/peace making tours assigned to our Corps. Thank you for your devotion, dedication, and service to our soldiers, our Corps and our Country.

In August of this year I attended the graduation parade of our Primary Reserve and Regular Force Armoured Reconnaissance Troop Leader courses. I would like to compliment LCol Malejczuk and all the Armour School staff for the fine product they are producing for our regiments. I was particularly delighted to see the grads conduct a roll-past which included Leopards. This is the first in many years and certainly, I hope, won't be the last.

I would like to pass on to you all, the message that I passed on to our recent graduates. The Canadian Forces, including our Corps is and will continue to go through a period of transition and organizational change through 2012 to 2014. All of us from the newest trooper to the Colonel Commandant must remember: We are an armoured corps equipped to do battle centrally in armoured fighting vehicles which, if used properly by determined and skilful leaders, can be decisive. Working with other arms and combat support units, armour can break the enemy's will. That is what battles are all about.

We are not support troops, or special purpose troops, or environmental troops or cannon fodder. We are meant to be the tough, breakthrough attackers or the resilient, flexible defenders or the violent, audacious pursuers always in the van of the theatre battles. Although we can also do light and medium reconnaissance or economy of force missions or double temporarily in other roles for peacekeeping or internal security or whatever, those are peripheral. Our basics are firepower, mobility, mass, shock, action protection, manoeuvre and endurance in the heavy going of war. The return to conventional armoured fighting skills took place in the Armour School in September 2012 with the roll out of the new Leopard's and the regimental gunnery competition.

Therefore, armoured officers who are to be truly professional must strive to master the intricacies of leadership at all levels, the training of our soldiers and the self development of subordinates, the nuances of tactics, the essentials of strategy and last but not least, everything there is to know about past, present and future armoured fighting vehicles in general and gunnery in particular. Knowing those things, we can lead our troops in battle and train our troops for contingencies skilfully.

In closing, I look forward to working with and for all of you during my tenure as your Colonel Commandant.

Worthy,

Darrell M. Dean CD  
BGen [ret'd]  
Colonel Commandant



## DIRECTOR OF ARMOUR INTRODUCTION

Having recently assumed the position of Director Armour, I must admit that the sheer complexity of the many issues facing the Corps can appear daunting. Until, that is, I took the time to peruse back issues of the Armour Bulletin, and realized that our Regiments, our Corps, and indeed our Army are constantly facing challenges. Over the past decades we have faced the challenges of too few and antiquated vehicles, the challenges of growing our establishment and implementing new equipment; the challenges of vague training standards and not enough training opportunities for our Primary Reserves, the challenges of tempering expectations for training levels once standards were imposed, the challenges of fighting a war with sub-optimal establishments, the challenges of shrinking our establishment... our history is that of facing, and overcoming, challenges. And while I think that the next few years will continue to bring challenges, they will be faced with logic, determination, and a recognition of the need to preserve our core fighting skills and the versatility of our officers and NCMS.

Issues of primary concern to me at the moment are the establishment of Persistent Surveillance Suites (PSS) as a viable capability embedded in the Armour Reserves, career management

of our CWOs once they have completed their demanding tours as RSMS, the large numbers of officers in our Regular Force training systems, the availability of platforms for our Reserve Force to train on, and setting the Corps up for success with the introduction of the new vehicle fleets which will soon begin arriving. I look forward to working with my Deputy Directors, both Reserve (LCol Bell) and Regular (LCol Malejczuk), the Corps RSM CWO Head, our Col Cmdt and our Corps Association as we maintain and perpetuate the history, traditions and legacies of those who have gone before us. We will also begin putting meat on the bones for the Corps Anniversary to be celebrated in 2015 in Borden, a great opportunity for us to gather and remember.

Worthy!

S.M. Cadden  
Col  
DARmd



## ARMOUR BULLETIN EDITOR- IN-CHIEF FOREWORD

This past year has seen a number of notables within the Corps and a glimpse of what the not too distant future will hold. Introduction into service of the Leopard 2A4 Canadian, announcement of Textron's Tactical Armour Patrol Vehicle (TAPV) as Coyote's replacement not to mention bridging the 'platform divide' between Regular and Reserve, the move to decentralize and export some School-house courses to the Field Force, NCM Progression Realignment, and the remaining establishment changes over the next two years are just some examples that will continue to engage us all as we continue to narrow arc markers and refine the target sets associated with continued transition. Major Brian Corbett's article *The Thinning Red Line: The British MOD, Force Reductions and a New Model Army* reinforces that our Allies are also embracing the challenges of change. As well, I would like to welcome to the pages of the Armour Bulletin our new Colonel Commandant Brigadier General (Ret'd) Dean, Director of Armour Colonel Cadden, and Corps RSM Chief Warrant Officer Head, and to thank the former, Major General (Ret'd) Addy, Colonel Nixon, and Chief Warrant Officer (Ret'd) Belcourt.

The articles found within this Year's edition of the Armour Bulletin are representative of the discourse that continues to occupy our Corps' discussions as we move forward in a dynamic yet exciting

period. Building upon last Year's edition, it is truly impressive to see the number of articles that have been submitted. As a result, the Bulletin has taken on a new structure and is organized upon the following five themes: Reserve Training, Competitions, Leopard 2, Our Allies, and New Capabilities. Of course, a publication of this calibre must heavily rely on those that work behind the scenes. In my capacity as Editor-in-Chief, I have been very fortunate to have Major Dale Childs and Captains Cameron Meikle and Simon Godin with team assemble and produce yet another outstanding edition.

In closing, I would like to thank all those that contributed to this Year's edition. The Armour Bulletin provides a professional forum in which we can all benefit from the accumulated experiences of others as well as stimulate healthy and constructive debate on what the future should, could, and will be. Good shooting!

WORTHY!

J.J. Malejczuk  
LCol  
Editor-in-Chief



**Corps RSM's  
Message**

This being my first letter as your Corps RSM let me state what an honour and privilege it is to be able to serve the Corps in this capacity. Please join me in thanking the outgoing Corps RSM, CWO Mario Belcourt, for his outstanding contribution to not only the Corps but to the Canadian Forces as well. CWO Belcourt retired in July of this year after 34 years of loyal and dedicated service. Mario, we wish you all the best in your future endeavours and hope you enjoy your well deserved retirement. Bonne Chance!

I was given the opportunity to attend the Leopard 2 Roll-Out Ceremony at the Armour School in September. I must confess that after witnessing the professionalism of our soldiers and the capabilities of the new tank, I was left with a strong sense of pride mixed with a small measure of jealousy. Watching the Leopard 2's scream by the bleachers with those 120 mm cannon's belching fire.....Whooa!! Well done to the Armour School on an incredible job. Now, if only I were 20 years old again!

The future of the Corps looks brighter than ever. There's new equipment on the way; the Leopard 2 and the Tactical Armoured Patrol Vehicle (TAPV) will be great additions to replace our aging vehicle fleets. The Corps remains a great career choice for those wishing to pursue that avenue. The Canadian Forces and the complexities of the modern day battlefield, combined with the high tech equipment, demands more from

soldiers today than those of previous generations. If there is one piece of advice that I would give to today's generation of crewmen it would be this: stay current, continue to educate yourselves and pursue second language training early in your careers. Though it is a chain of command responsibility to ensure that you receive the required professional development at the appropriate time along your career path, you are in the best position to influence this as your own career manager.

In closing, I would like to extend a warm welcome to the new Colonel Commandant of the Corps, Brigadier General(retired) Darrell Dean and the new Director Armour, Colonel Steve Cadden. I have known both these fine gentlemen for many years and look forward to assisting them as they continue to guide the future of Corps. I will also take this opportunity to say farewell to our outgoing Director, Colonel Mike Nixon and to wish him all the best on his new appointment as Commander Combat Training Centre in Gagetown, NB.

WORTHY!

D.W. Head  
CWO  
RCAC RSM



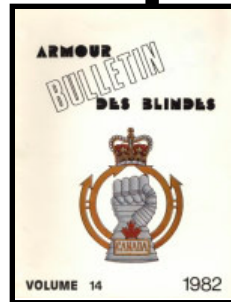


# Flash Back

## 1982

30 years ago

In 1982 the indoor miniature range (IMR) in Lahr Germany was lacking in its ability to be realistic or fun; one of the basic principals of soldiering according to the RCD stationed in Lahr in their Armour Bulletin article titled "Making a Good Training Aid Better." To increase the value of this simulation they made a 32' x 32' playground complete with night flares, indirect lighting, pop-up and moving targets creating the feel of actually surveying the German countryside.



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.



# 1992

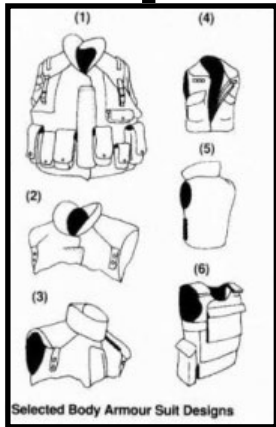
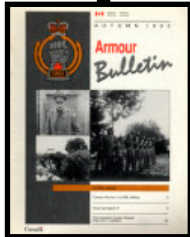
20 years ago

In 1992 the Armour Corps was concerned with crew safety, specifically how crewman were forced to remove their webbing prior to entering the fighting compartment of a tank. As such, in the Armour Bulletin article "AFV Crewman Vests" by Lt J.J. Malejczuk AO C Sqdn RCD proposed a crewman vest that would both provide the crewman extra protection, while allowing him to keep key pieces of equipment on his person both in and out of a tank.

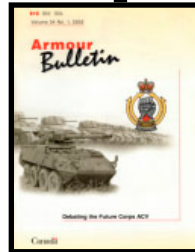
# 2002

10 years ago

In 2002 the Armour Corps was faced with an aging Leopard 1C2 tank and requiring a replacement during a time where the Army was required to become more sustainable. In the article "ACV – The Way Ahead" by Capt Darren Bromley of the LdSH(RC), the argument is made that Leopard 1C2 serves no purpose other than a tank trainer and the Armour Corps should look at the vast methods of employment and flexibility a wheeled Armour Combat Vehicle (ACV) could provide.



Selected Body Armour Suit Designs

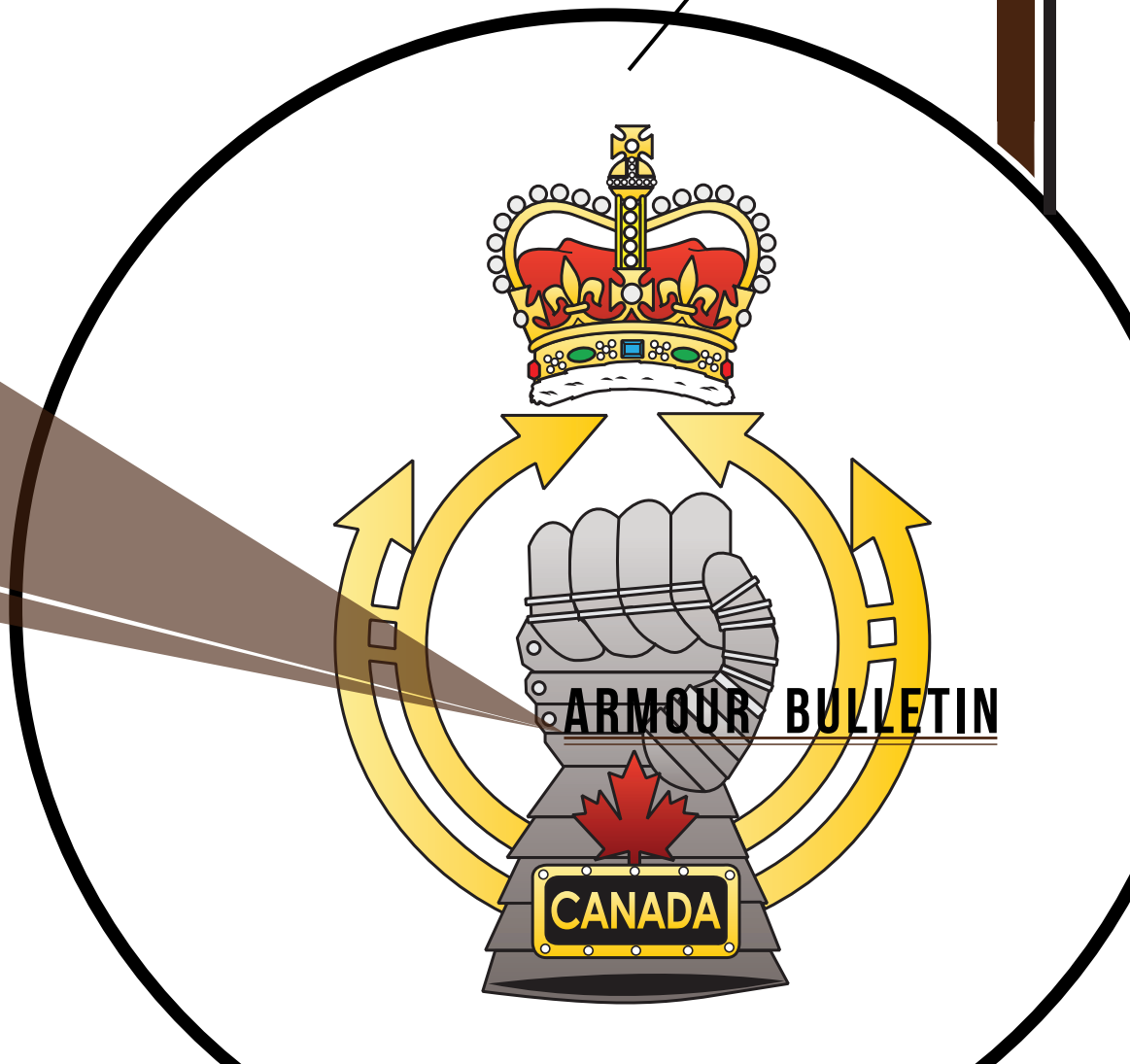


The Leopard and Cougar: both nothing more than tank trainers.



Right Side View    Front View    Back View    Left Side View

# GENERAL





## Force 2013: A Short History

Written by  
Maj D.L. Childs

While some may have heard of Force 2013, many have seen the impacts perhaps without the benefit of the background. In April 2011, the three Regular Force Armoured Regiments were initially cut by a total of 315 positions, at the time equivalent to three under-strength recce squadrons. Cuts like this occurred throughout the Army in order to create the positions necessary for the reinforcement of the Intelligence Branch, the creation of the Medium Lift Helicopter capability in Petawawa and to reinvest in combat service support to name a few. Cutting these 315 positions meant that each Regular Force Regiment lost a reduced recce squadron in structure along with the people.

At this stage, the structure of the Corps was to be based on nine fighting squadrons: two tank and one recce with the LdSH(RC) in Edmonton; three recce with the 12<sup>e</sup> RBC in Valcartier; and for the RCD, two recce in Petawawa with a tank squadron in Gagetown. Although we had lost positions, the intent was to fill each squadron to approximately 87% of their doctrinal full strength thus avoiding the hollow structures of the past. It was immediately clear that this structure had two shortfalls: the 12<sup>e</sup> RBC was completely removed from tanks; and there was no ready mechanism to support conversion between tank and recce should there be a surge along one of these lines.

When Director Armour spoke to Commander Canadian Army, he was able to secure 32 additional positions and permission to form a tenth squadron. Distribution of the 32 positions was determined largely based on capability

densities and most positions went to either the LdSH(RC) Recce Squadron (as the only Western Area recce squadron) and the Gagetown Tank Squadron (as the only Armour sub-unit in Gagetown). This reinforcement brought Crewman and Armour Officer manning to 100% thus enabling their force generation. The tenth squadron proved slightly more problematic.

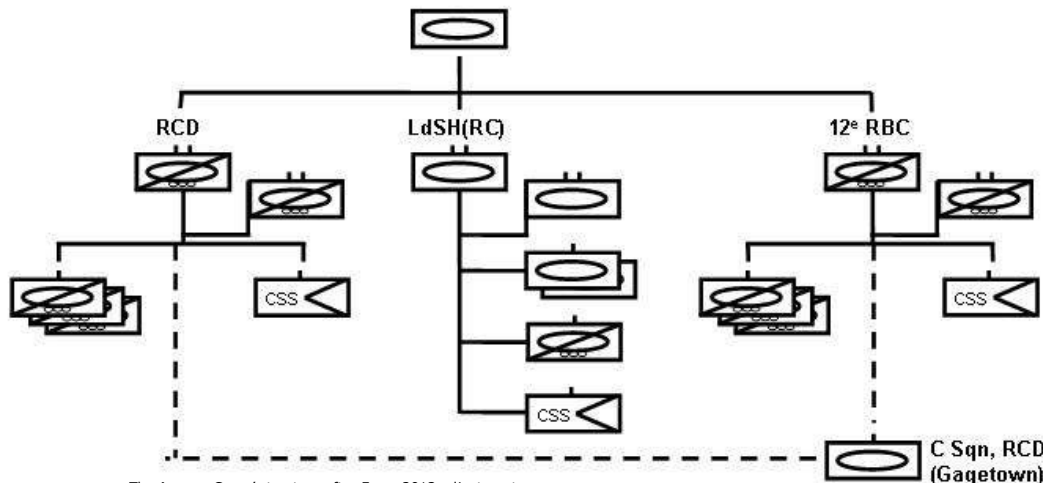
Although there was structure, there were no additional positions. How then to populate this tenth squadron and address the 12<sup>e</sup> RBC tank deficiency? To maintain tank skills, Gagetown squadron positions were divided between the RCD and 12<sup>e</sup> RBC. By sharing this squadron (to include alternating command teams) both regiments can maintain tank qualified personnel. To populate the tenth recce squadron, half of the third 12<sup>e</sup> RBC recce squadron was transferred. The result is a zero-sum game where both the RCD and 12<sup>e</sup> RBC each lose and gain half a squadron. However, the third recce squadron in Petawawa and Valcartier were now reduced. The Army later decided to place the Gagetown Tank Squadron under the command of 2 CMBG and the RCD as C Sqn RCD. This created a "paper imbalance" when not viewed through respective preferred manning levels.

While these third squadrons did not have sufficient equipment to begin with, it left a problem for each unit to resolve in terms of distribution throughout their regiment. The reduced recce squadrons were intended to generate flexibility for the Corps; a sudden requirement to force generate additional tank squadrons could use the reduced squadrons as the nucleus. However,

why have two recce squadrons of 125 crewmen and one of 60 when you could average them so that each has about 100-105? The spectre of hollow structures returns but this time without the external pressure of the Afghanistan mission.

There have been a number of sidebar discussions about how to resolve the issues with the current structure. The 12<sup>e</sup> RBC could abandon tank altogether to focus solely on recce, although that ignores lessons learned from Afghanistan and the flexibility intended above. Perhaps the most interesting idea is the creation of a fourth tank squadron in Gagetown, this one belonging exclusively to the 12<sup>e</sup> RBC. The RCD and 12<sup>e</sup> RBC would then each have two recce and one tank squadron although the regimental footprints in Valcartier and Petawawa would be substantially reduced. There would be two tank squadrons operating in semi-isolation without the same level of HQ Sqn and Service Battalion support. While there appears to be no single, comprehensive solution, maintenance of flexibility remains essential for the future Armour Corps.

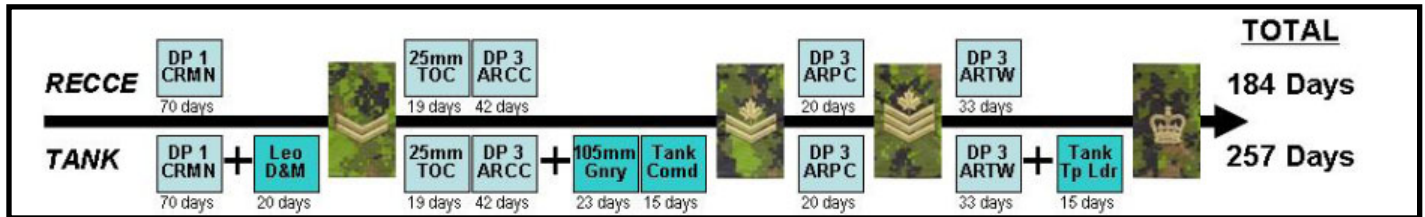
**Editor Note: Force 2013 is an Army-wide effort aimed at restructure and proper accounting and distribution of equipment. It is by no means the end of transformation as Force 2016, and Force 2021 loom on the horizon. This restructure has not been without its associated issues: the asymmetric distribution of tanks compared against the desire to maintain tank skills in each Regular Force Regiment; eliminating hollow recce squadrons only to replace some with reduced structures that encourage averaging across regiments thus recreating hollowness; and geographic dislocation and the associated real-time issues. As new capabilities are fielded the pan-Corps analysis will continue to inform the Corps evolution towards Force 2021.**



The Armour Corps' structure after Force 2013 adjustments.

## Crewman Career Progression and Course Review

Written by  
Maj D.L. Childs



This picture depicts the current NCM Career progression course path and the length of time it takes to train a Recce Tp WO and a Tank Tp WO.

There is a requirement to overhaul the development period progression for crewmen and the courses associated with that progression. There are several broad issues that this review aims to address, integration of tank training being at the forefront. Put bluntly, training the entire Corps for recce and converting a sizeable portion over to tank is inefficient; it doubles the time required to train soldiers to do a primary combat function. That said, there is a considerable amount of similarities in the training that can be leveraged to facilitate conversion between recce and tank, especially at key experience levels like crew commanders and troop warrant officers. Also, while courses seem to exist in a constant state of flux, very little attention has been paid to modernizing training delivery. Modernization aims to improve the quality of training, improve the overall success rate and – should push come to shove – facilitate the rationalization of individual training (read reduction). Finally, given the importance placed on the Armour Reserve, training needs to be harmonized between the Regular Force and Reserves with a view to a single standard for both.

A common question that arises is the separation of the Armour Corps into two military occupations, one recce and one tank. This is an inappropriate option for a number of reasons. First, if one of the strengths of the Corps is its flexibility, then establishing multiple occupations only establishes unnecessary barriers for conversion. Second, to Corps Force generation, unity is essential and flexibility paramount.

The work done to date has focused exclusively on Crewmen with some very impressive results. The DP 1 Crewman course will be modified. Instead of two recce primary combat functions (PCF), students will get one PCF from a larger selection. This will enable the training of tank drivers and, should operations require, a number

of PCFs could be substituted without need of a waiver. For the Armour Reserve, the DP 2 Recce Observer will be eliminated and amalgamated into the Reserve DP 1 Crewman. Not only will this harmonize the Regular Force and Reserve training but will result in an up to 10 day savings.

As of now, completion of the Primary Leadership Qualification – Land (PLQ-L) will enable appointment to MCpl. Retention of that appointment will be linked to completion of the crew commander qualification within two years. The vital ground for the Regular Force is crew commanding from a stabilized, direct-fire manoeuvre platform. The corresponding intent is to have a common theoretical portion of the course then split into a Recce and Tank mod depending on the student's future employment with the use of the LAV (Coyote, LAV III or LAV UP) for the recce mod or the Leopard for the tank mod. The Armour Reserve will have the flexibility to complete their training on either TAPV or LUVW, depending on their qualifications.

The DP 3 Patrol Commander simply does not fit within tank progression. This course will no longer be a requirement for promotion to Sergeant and instead become a requirement for employment as a patrol commander. There is a strong case to expand this course to enable additional, specialized training. The DP 3 Troop Warrant Officer will be modeled similarly to the Armour Crew Commander course to allow tank and recce focus. This course will remain a prerequisite for promotion to WO.

Conversion between tank and recce streams will be largely gunnery-based to enable the same operation of the platform. Training deltas, for the most part, will be made up using on-the-job training vice formal retraining. While this approach is not without criticism the logic is sound. Converted crew commanders will be under close supervision within their patrol and/

or troop thus placing the onus on the units to develop them. Converting patrol commanders proves the exception in that the DP 3 Patrol Commander is required. For Troop Warrant Officers, risk is assumed by relying heavily on on-the-job training. While a marked departure from current practices, it is interesting to point out that we typically accept sizeable risk when training officers (who have no experience) but are arguably risk adverse when it comes to senior Sergeants with 15 years or more experience.

Considerable work remains on this initiative. Progress into the remaining courses will likely start early in 2013. Despite the work remaining, those involved are highly motivated to "sort out" training and enable the Corps for the future.

**Editor's Note:** This revision has been a long timing coming and the conditions are being set to start DP 3 pilot courses in Fall 2013. We look forward to the continued contribution of the Corps – both Regular Force and Armour Reserve – to ensure that these solutions meet the needs of the field force.



## Army Driving and Maintenance Team

Written by  
MWO J.M.E. Robichaud

In an effort to increase the level of operator driver and maintenance skills across the Army, the Armour School has created the Army Driving and Maintenance Team (AD&M Tm). Although still in the development stage, it is envisioned that this team will enable all D&M courses for the Army by maintaining, promoting and monitoring of D&M training standards, modernizing training methods and techniques, and serving as the Centre of Excellence (CoE) for these courses. In its current form, the AD&M Tm currently provides this function for nearly all Army vehicles:

AVAMs	LFC Dvr Wheel	Leopard C2	Leopard 2A4M	Leopard 2A6M
Leopard 2A4 CAN	LUVW	LUVW Milcot	LSVW	MLVW
HLVW	MSVS	RG31	Bison all variants	TLAV
Coyote	TAPV			



Courtesy of Combat Camera Photographer MCpl A. Abbey

Corporal Fredrick Rodrigue from 12e Régiment Blindé Canada (12 RBC) checks the hub oil on a Leopard 2A6 tank during routine maintenance in Afghanistan

The primary challenge in creating the AD&M Tm is buy-in from the rest of the Army. Although the Team is the CoE for a wide fleet of vehicles, these vehicles are widely used and taught without knowledge of this. Building on the Army Instructor Gunnery Team (AIG Tm) construct as an example, the AD&M Tm will likely spend time becoming known by the rest of the Army and assisting other Corps and Branches with training delivery issues. The principle benefit, as witnessed through the AIG Tm, will be a single source of subject matter expertise related to operator driving and maintenance.

The current requirement for the AD&M Tm is rooted in the past. In the mid 1990s a decision was made to stop conducting the Advanced Driving and Maintenance course (Adv D&M). This very important course was used to develop subject matter experts (SME) on all Combat Arms D&M related material. Since cancelling this course the Army has seen a decline in the quality of D&M instruction as many of the qualified SMEs were either moving on to other trades, releasing, or retiring from the military. Further, in-service skill was further reduced by reliance on contractor support for driver training. While essential due to our operational tempo in recent years, we have lost a skill-set that needs to be regained. Analysis is currently ongoing for the re-establishment of an Advanced D&M course focused on instructor skills and qualifications given the fielding of the new Family of Combat Vehicles (FLCV).



Courtesy of Cpl M.R.F. Elley

Students on the Leo 2 Instructor Cadre Training learning how to remove the pack. This type of training and standard is now the responsibility of the newly created Army D&M Team.

**Editor's Note:** *The inaugural AD&M Tm has already completed work on driver simulation and continues to define advanced training. Considerable training is required to conduct driver training on our vehicles and the advanced course may be the best method to package and promote such training. This is not just an Armour Corps issue but rather affects the entire Army. It is in support of the Army that the AD&M Tm, like the AIG Tm, will prove its worth.*

## Training a “Specialist” on the ADFS

Written by  
 WO J.I. McGregor

The Armour School graduated 31 new Army Direct Fire Specialists (ADFS) in April 2012. Graduates were given the technical skills required to instruct and coach Armour Fighting Vehicle (AFV) gunnery, plan and conduct individual and unit level gunnery training, and provide specialist advice to their chain of command on direct-fire weapon systems. However, this year’s course attempted to go a step further.

In an effort to revitalize the “Specialist” aspect of the ADFS course several initiatives were undertaken by course staff. The first was the reintroduction of technical classes or “advanced knowledge on the weapon system,” as students no longer receive detailed instruction on the 25mm cannon. This was taught by Weapons Technicians and allowed for a more thorough look at the intricacies of the complex weapon system. Also included was advanced troubleshooting and remedying of a jammed cannon, which the students themselves were able to offer plenty of analysis. Although the extra training was well received and that more of these classes were welcome, it was clear that these should be taught by IGs themselves. A full day, 10 period technical class has been prepared by the Army Instructor in Gunnery

Team (AIG Tm) and will be taught by IGs on the next ADFS.

With a better understanding of the 25mm cannon the students went out to the range. The focus of the live-fire range is coaching an AFV crew through a series of basic engagements as per the course firing table. The course staff wanted to provide more and through clever use of ammo was able to form a strategic reserve for student-run range trials. Each crew was given the task of planning and conducting an unofficial range trial. The intent was to evoke critical thought, expose the ADFS students to the trial process (which is part of being a specialist), and to reinforce AFV gunnery techniques. The trial subjects were, however, deliberately picked by the Armour School RGWO and AIG Tm Leader as they were very relevant to some current and future projects the AIG Tm were working towards. The ADFS students did an excellent job given the limited resources at their disposal.

Some of the trials included a proposed new start mode for the Leopard, potential future changes in fire orders, new engagement techniques, time and accuracy standards, and battle aiming marks for different ammo types

to name a few. The results of the unofficial trials were shared with the AIG Tm and in some cases with the Regular Force Armour Regiments through their RGWOs. The consensus from both staff and students was that the training value gained from the range trials was excellent; the higher level of understanding of techniques, procedures, and equipment handling gained was beyond measure. Dynamic and challenging shoots or a mini-competition as well as trials could be set up providing the students further confidence in their weapons platform. The next ADFS will conduct a similar project to pave the way for the rewrite of the course.

Just as the UGO or UGW0 must look for new and exciting ways to challenge their units gunners to excel, the course staff for ADFS needs to ensure they are providing the best resources and time to produce outstanding IGs.

**Editors Note: the ADFS course continues to evolve and analysis is on-going for inclusion of PrRes candidates. With the complexity of direct-fire systems within the Army’s inventory, this skill-set that the ADFS graduate provides can’t be underestimated.**



Students and Staff of the ADFS course on the 25mm range in the Gagetown training area.



The ADFS Course Officer Capt Lambert overseeing the safety aspect of the live-fire range portion of the course.

## Armour Reconnaissance Squadrons Add Eyes in the Sky with the MUAV

Written by  
WO D. Cobbett



Courtesy of Cpl M.R.F. Elley

Warrant Officer Jason Ellsworth prepares his Maverick Mini Unmanned Aerial Vehicle (MUAV) to get a "bird's eye view" on the terrain to be used for a training operation in CFB Gagetown. Quick and simple to operate, the MUAV can provide near instant real-time information to commanders for planning purposes.

The procurement of a Family of Unmanned Aerial Vehicles (FUAV) began in May 2000 and since that time the project has evolved to include both the Small and Mini UAVs for Battle Group/Task Force and recce sub-units and sub-sub units respectively. In addition to Infantry Recce Platoons, MUAV will be distributed to each Regular Force Armoured Reconnaissance Squadron.

The Maverick MUAV was purchased by the Canadian Army for immediate employment in Afghanistan to fill an Unforecasted Operational Requirement (UOR). Given Canada's mission transition from combat operations to training there is no longer a requirement for this capability in theatre, and they have been returned to Canada. The Army has eight systems in total with each system containing a Ground Control Station (GCS), field repair kit, battery charger, shipping case, three aerial vehicles with storage tubes, and four rechargeable battery packs.

In anticipation of this future widespread capability, the Armour School was issued a complete Maverick MUAV system to develop tactics, techniques and procedures (TTPs)

for employment within Recce Squadrons. To facilitate this, four members of the School attended MUAV operator training and were exercised as an attachment to the Reconnaissance Squadron during 5 Canadian Mechanized Brigade Group's recent exercise in Gagetown, Exercise LION INTREPIDE. During the exercise, several missions were flown to attain situational awareness (SA) for the Squadron, allowing Troops to maintain distance between themselves and the enemy force. While some missions were hampered due to weather conditions, and the occasional technical glitch, the MUAV operators were able to provide real time SA on ground activities and the captured video feed proved invaluable for planning of operations.

MUAV operation requires two qualified personnel, and during the trials it was found to be most effective when the system was placed in the troop leader's patrol. This allowed the troop leader the freedom to manoeuvre and support any of his patrols that encountered a situation requiring the capability. The Maverick proved effective out to a distance of approximately 3 kilometres from the control station and was

able to stay in the air for about 45 minutes with full battery charge. Battery life was noticeably reduced in colder temperatures. During the trials it was determined that by maintaining an altitude of 800 ft above ground, the MUAV was virtually undetectable; the electric motor could not be heard from this altitude and the aircraft was far enough away that if noticed at all, was mistaken for a bird.

While there are several contenders bidding for the contract which has yet to be awarded, system capabilities and limitations will likely be similar to those of the Maverick MUAV. This should provide the modern-day reconnaissance squadron with an extremely flexible tool for developing SA in a broad spectrum of situations and environments.

**Editor's Note:** *The MUAV will provide a unique capability to Armoured Recce Squadrons but, like any capability, it requires training and practice to maintain currency. MUAV is especially hampered by the requirement for frequent confirmation flights in order to retain required certification and will no doubt provide another annual training challenge. The Armour School has had difficulty maintaining the MUAV skill set despite tremendous latitude in scheduling.*



## Combat Team Commander Course (CTCC) – Maximizing Training Opportunities

Written by  
Maj E. Angell



The CTCC students meet for an after action review (AAR) after a hasty attack.

In the spring of 2012, and for the first time in recent history, the field portion of the CTCC was run as part of Exercise WARRIOR RAM (Ex WR), a 1 CMBG training event. It was outstanding and I would argue that we received a better training experience than those who have done the course previously. I would also argue that combining the CTCC with Brigade and Battle Group training events is the way forward.

CTCC 1201 had two square Combat Teams, both of which had been training together for a month before our arrival. Additionally, Wainwright offered a far superior mechanized training area than Gagetown, allowing the construction of 12 different enemy positions without having to cover the same ground twice. After all students had completed the course requirements, a few select students were given the opportunity to command a Combat Team as part of a Battle Group attack or to command the Brigade Recce Sqn for these attacks. Students not only conducted Battle Procedure at a higher level, but also had the opportunity to execute the plan with real soldiers, something that can not be replicated during a computer assisted exercise (CAX) or during a CTCC conducted in isolation.

The students benefitted greatly from having actual Officers Commanding as mentors in addition to the Directing Staff (DS) from the Tactics School. While the Officers Commanding were not acting as DS as far as assessment was concerned, they possessed a wealth of knowledge to impart on the students. This mentorship was key to the success of CTCC 1201, passing on not only the theory of the Combat Team in Battle, but also real world experience and advice on a myriad of topics, from soldiers to tactics.

There were a number of advantages to this combined training model, not the least of which was supporting the Army Commander's desire to maximize every training opportunity and to create synergies when



Courtesy of Master Cpl M.A. Gaudreault, Canadian Forces Combat Camera

A Leopard C2 dozer tank in Wainwright.



Courtesy of G. Cree

The business end of a Strathcona Leopard 2 A4M



A LdSH(RC) B Sqn Leopard C2 on guard in the leaguer.



possible. Combining the two was no doubt a great cost saving measure considering that the bulk of the soldiers and equipment were already in the field. Junior leaders were exposed to a variety of operations and leadership styles from the students and the Brigade was afforded the opportunity to influence the development of its Combat Team Commanders.

For all its advantages this training model may be difficult to synchronize and will not work in all situations. It easily fits into foundation training but may not work well if a Battle Group or Brigade is undergoing Theatre Mission Specific Training. It may not work well as part of an Exercise MAPLE RESOLVE type exercise either, where war-fighting may not be the focus. It also does not allow many opportunities for Level 5 live-fire, as the Combat Team Commanders are students and inexperienced. Finally, coordination between the Tactics School and the Brigade is essential to ensure that the course and Brigade schemes of manoeuvre are properly synchronized (with a bias towards ensuring a proper training environment for CTCC students).

There are further efficiencies to be gained, specifically concerning Armour students. Due to our lower numbers, each Armour student gets the opportunity to be a supporting arms commander four times more than an Infantry student on average. Given that the Brigade Recce Sqn was deployed there were opportunities for Armour students to ride along with OC Recce, instead of simply riding in the back of an Infantry LAV.

In summary, CTCC 1201 was an outstanding training opportunity for both the students and 1 CMBG. This course should be used as a model for future serials and an effort should be made at the Army level to synchronize these types of training events. The students and Brigade soldiers completed the course/exercise with a far greater understanding of not only the combat team in battle but also how it fits into the greater Battle Group and Brigade context. However, we must remain vigilant to ensure the CTCC does not get "watered-down" in order to shoehorn it into a specific exercise merely for cost-savings; the focus must remain on war-fighting.

**Editor's Note:** A challenge with this course is ensuring that Armour students are versed in tank operations, as that is central to the training and the all-arms capability. As Armour courses are revisited, emphasis will be placed on exposing students to both tank and recce in order to facilitate their cross training. Unfortunately, this still means that there is a "bubble" of officers who were only ever trained in recce. Also, if the future of training of this nature is to move it more into the collective training environment, it will be interesting to see applications to other courses of this scale. As an example, the RCD conducted a Regimental-level exercise supported by 2 CMBG in support of the Reserve Armoured Reconnaissance Squadron Commander Course in November, which leveraged a Regimental-level collective training event to provide a greater enabled individual training course. From all accounts, the course was a success but as Maj Angell states, it will be about the deliberate synchronization and war-fighting focus of training events, in order to maintain successes to date.



Courtesy of G. Cree  
Major Clayton Gardner issues orders to his combat team before a night operation as part of a 2 VP BG night attack.



Courtesy of Capt D. Cronk  
The combat team approaches the enemy through the woods.



Courtesy of Capt D. Cronk  
A combat team square leaguer in the badlands.

## Return of Advanced Armour Qualifications?

Written by  
Maj D.L. Childs



Courtesy of Cpl N.J. M.E. Alonso

Advanced courses would allow for skill-sets that have not been the focus of much attention in recent years to be brought back into the arsenal of Armour Crewmen. The Armour School is currently investigating changes to the Advanced Direct Fire Specialist (ADFS) course to improve the utility and focus of the training as well as re-creating Advanced Recce, Advanced Communications and Advanced Driver and Maintenance courses.

The Army Instructor Gunnery Team (AIG Tm) is reviewing the Advanced Direct Fire Specialist (ADFS) course to make it more pragmatic, improve Army-wide gunnery training and enable the Armour Reserve. Combined with work on Crewman Realignment, interest in other advanced qualifications was reignited. Needs Assessments are currently being written for circulation throughout the Corps in an effort to determine the interest and scope of such training.

At present, there are four courses being investigated related to gunnery, recce skills, driving, and communications. Many who attended the August 2011 Crewman Realignment working group were MWOs who immediately linked these ideas to the old Advanced Comms, Advanced Driver and Maintenance, and Recce Specialist. After some analysis, it seems that "old school" is the best school; these are concepts worth reinvigorating.

As mentioned, the ADFS has already been subjected to considerable review. The envisioned end-state is to divide the current course into a gunnery instruction portion and a Unit Gunnery Officer / WO (UGO / UGWO) portion. The primary user of the course, the Infantry, typically sends MCpls in order to maximize their employment. These MCpls are so far removed from UGWO responsibilities that this training is not required. Also, there is no training provided to the Armour Reserve. The proposed division will teach IGs the basics of coaching and instructor supervision/development. The UGO/UGWO portion will then focused on advanced gunnery skills (e.g. ballistics), templating and advising the Commanding Officer on gunnery issues.

An advanced recce course would allow certain specialist skills to be covered with a small, select audience. With assault troop structures falling to the wayside as part of army transformation, certain capabilities such as ambush

/ counter-ambush and mobility / counter-mobility could be consolidated in a new course. With the introduction of new capabilities like the Mini-Unmanned Aerial Vehicle (MUAV) and LAV Recce, there will be a large amount of technical skills that could also be included.

Advanced driver instructor would likely encompass the extensive training that already has to be done by driver instructors (Safe Backing, Defensive Driving, air brake, In-Cab Instructor, Driver Examiner, etc). While this is of particular use to the Armour School due to the amount of driver training, it may not be as valuable for the Regiments. For the latter, emphasis will be placed on the Fleet Management System (FMS) and accident investigator qualifications to improve employment in a regimental transport troop.

Finally, advanced communications is perhaps the most controversial idea. It was born out of a desire to lean into a wide range of forthcoming communications capabilities like satellite on-the-move (SOTM), Tactical Vehicle Network (TVN) and other aspects of Land Command Support System (LCSS) Life Extension Project. Taking a lesson from the Tactical Command and Control Communications System (TCCCS), personnel conversant with the equipment and capable of conducting basic troubleshooting are a valuable asset.

With any of these ideas it is essential to obtain Corps and, in the case of ADFS, Army buy-in. To ensure that the concepts survive contact with a training system aiming at rationalization, the requests need to deliver valuable, relevant capabilities efficiently.

**Editor's Note:** *There is value in courses of this nature, especially given the complexity of capabilities emerging in the Corps in the next several years. While some of these ideas may not "survive contact" with the units, we look forward to the discussion it will generate.*



## Exercise LION INTRÉPIDE 2012

Written by  
Capt C. Chevalier

Last spring, 12<sup>e</sup> RBC was deployed as a battle group (BG) for the first time in several years. The deployment was part of Exercise LION INTRÉPIDE 2012, involving 5 CMBG, which included four days of force-on-force training in which the BGs of 12<sup>e</sup> RBC and 2 R22<sup>e</sup>R faced off against 1 R22<sup>e</sup>R to practice conventional offensive operations.

For 5 CMBG, it was an important event as, for at least the past 10 years, all of the BGs generated have been infantry-based. The issue of tanks was the focus of many discussions.

As everyone knows, tanks were re-allocated asymmetrically within the Armoured Corps in order to make the most of limited resources. In a brigade deployment context, the lack of tanks in a semi-heavy Brigade Group had a noticeable impact. Because 12<sup>e</sup> RBC is only a Reconnaissance Regiment, it no longer has the logistical support capabilities, the expertise nor the density of qualified personnel to use tanks in a brigade deployment. When C Sqn RCD joined the 12<sup>e</sup> RBC BG, the difficulties immediately became apparent.

When it came to using tanks in conventional operations, the expertise no longer resided with the RHQ, as it had in the past. There was a lack of interaction with the tanks and, more specifically, a lack of officers and non-commissioned officers with the necessary experience and qualifications. In addition, the Bde HQ did not have the combined arms combat experience which used to be second nature. As a result the planning and employment of this manoeuvre sub-unit suffered greatly. The fact that C Sqn RCD is a predominantly Anglophone squadron also resulted in a number of communication problems.

The loss of expertise was also an issue from a logistical standpoint. For example, the 12<sup>e</sup> RBC BG maintenance section was not prepared for the mechanical challenges of a tank squadron with respect to parts, tools and skills. This was a problem at the Brigade-level as well. For example, there was no longer any logistical support expertise within 5 CMBG and as a result the diesel usage forecast was unrealistic because there was no longer any corporate memory of how much fuel a Tank Squadron would use on exercise.

Another problem noted was the different operational tempo of the Sqn commanded by the RCD. Given that the Tank Sqn from Gagetown falls under the responsibility of 2 CMBG, the annual calendar is not synchronized with that of 5 CMBG. That led to problems with operational availability and interoperability. In addition, because of the grouping for TF 3-12, several months later during Exercise MAPLE RESOLVE, 5 CMBG called upon a Tank Sqn from Lord Strathcona's Horse (RC) in order to secure a direct-fire support manoeuvre element. That sub-unit change merely ensures that gateway training must be restarted for every exercise because the synergies of tactics, techniques and procedures (TTPs) and work habits need to be re-established. The lack of tanks in Valcartier limits the Brigade's ability to maintain its basic skills as a conventional combat team, re-synchronize TTPs, and develop the necessary team cohesion.

To end on a positive note, the integration of C Sqn RCD during Exercise LION INTRÉPIDE 2012 was eventually completed and everyone adjusted and learned excellent lessons. In spite of that, 5 CMBG will always be required to restart combined arms cooperation efforts if armoured resources continue to be distributed unequally.

**Editor's note: As indicated earlier, tank support for 5 CMBG will remain a problem so long as the structure of the Corps remains asymmetric. There is a risk that C Sqn will be required to support the entire formation of 2 CMBG and 5 CMBG, the former due to command relationship and the latter due to geography. (i.e. Gagetown training area)**



Courtesy of Capt D. Noel, Public Affairs  
A Leopard C2 tank from C Sqn RCD participates in an attack during Ex LION INTRÉPIDE.



Courtesy of Capt D. Noel, Public Affairs  
Members of the 2<sup>e</sup> Bataillon Royal 22<sup>e</sup> Régiment attack an enemy position during an assault undertaken with battle tank - Leopard C2 and an Alpha Jet in the Canadian Forces Base (CFB) Gagetown training area.

## Persistent Surveillance System: Lessons Learned from the last operationally deployed PSS Platoon

Written by  
Capt M. Vergeer

The Persistent Surveillance System has many factors that affect its employment including, connectivity to command posts (CP), equipment considerations, manning, instruction, training, and tactical capabilities. The PSS is an incredible intelligence, surveillance, target acquisition and reconnaissance (ISTAR) asset that was in very high demand during counter-insurgency (COIN) and force protection operations.

The Roto 3-10 PSS Platoon (PI) organization was composed of three detachments of 10 people each with one Sergeant as Detachment (Det) Commander, two Master Corporals as shift supervisors, and seven operators of the rank of Private or Corporal. This composition allowed for three 8hr shifts within a 24hr period. This structure should be the ultimate goal for future deployment of the PSS in order to ensure operators do not become fatigued. The composition of each PSS Det allowed for three people to be in the Ground Control Station (GCS) at all times. This is important as the Persistent Surveillance Aerostat (PSA) and the Persistent Surveillance Tower (PST) need to be controlled by an operator. The shift supervisor needs to coordinate the surveillance between these two systems, communicate on the radio, monitor changing weather patterns, and compose the daily PSS surveillance reports. The Platoon fell under the command of the battle group (BG) ISTAR coordination centre (ISTAR CC).

The PSS command was located at the BG Headquarters (HQ). It was composed of the PSS PI Comd, the PSS PI 2I/C, and a storeman. It is important that this command group be located at either the BG or Brigade (Bde)-level as the PSS PI Comd needs to be able to coordinate moves with the Engineer Support Coordination Centre (ESCC) and brief the S3/G3 and/or Comd of all considerations for the persistent surveillance plan. A key position that is not a part of the PSS PI structure but has a great impact on operability are LCIS Technicians. They must be able spend a great deal of time familiarizing themselves with the technical aspects of the system in order to trouble shoot problems and provide support.

The members of the PSS PI were predominantly from the combat arms and were members of the Regular Force. The majority had previously served in theatre "outside the wire". This

greatly assisted their ability to provide relevant information higher and coordinate surveillance with ground manoeuvre elements. It is highly recommended that future PSS PI members be drawn from a combat arms background and that they have experience in surveillance operations.

What became evident throughout was that there is a significant knowledge gap between of what is required as a PSS operator and what is required from as a Shift or Det Commander. PSS Det Commanders can be called upon often to support operations from the section to Battle Group level. A separate course may be required for this position to include the hasty battle

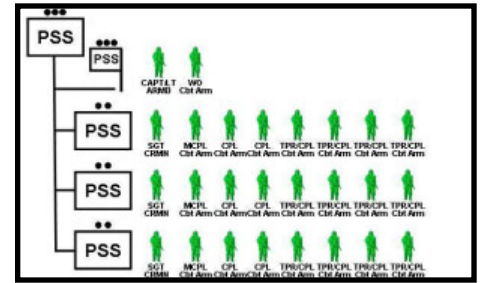


*PSS Members being instructed on the first train-the-trainer course prior to deployment on EX MAPLE GUARDIAN 10*  
Courtesy of Mr P. Richer

procedure required to support these operations, how to conduct reconnaissance for potential moves of the system, and qualify them as an image analyst. Many opportunities were missed in which a potential engagement could have been initiated by the PSS Det because they lacked this qualification.

As part of Force 2013, the Primary Reserve has been tasked to force generate PSS with the Armour Corps as the lead. While it remains unclear how PSS will be distributed throughout the Army and the degree of currency that is to be maintained, it is already widely understood that PSS will have to compete with other unique force generation requirements such as CIMIC and PSYOPS. This – on top of the Armour Reserves' requirement to force generate the Forward Support Group's Recce Troop – will require continued analysis to ensure that force generation expectations can be met as the Army continues its transformation to Force 2013. A potential interim strategy may be that these systems remain with the Reg Force who fill the Shift Commander and above roles and that the

Reserves are called upon to augment an existing structure by filling the operator positions (75% of the PI).



*Figure 2: PSS Organization recommended during the September 2012 PSS Working Group*

How the PSS will be deployed in the future depends on many variables. What is important to consider for future force generation plans is that the position of operator is easily backfilled by members with a simple course on the PSS but those in positions of leadership need to have experience with the system. The consequence of neglecting this point is that future deployments of the PSS will continually experience the same growing pains which the PSS PI Roto 3-10 experienced.

**Editor's Note:** Recommendations from a September 2012 PSS Working Group included an organization based on eight personnel per detachment, with the reduction based largely on the capabilities of the updated PSS. Of note, a key recommendation was the incorporation of the PSS command element within the Bde HQ, most likely in the ISTAR CC as but one of many systems in a layered ISTAR strategy. Just as mentioned here, this will enable the command and control of the systems and proper advisement to the Bde staff on PSS employment. Although a relatively static capability, it is transportable and we should refrain from defining the future employment of PSS strictly in terms of its employment in COIN support in Afghanistan.



## 2012 Instructor Gunnery Conference - Breaking new Trails

Written by  
Capt A. Lambert

The Armour School, as the Army Centre of Excellence (CoE) for mounted direct-fire, hosted the 2012 IG Conference from 20-22 November 12 in London, Ontario. The event was very well attended and a considerable success in terms of the exchange of information between the Army Instructor in Gunnery Team (AIG Tm) and the field units. The event plays a significant role in maintaining a gunnery standard across the Army and providing the necessary forum to discuss issues, problems, and solutions related to gunnery training.

It was the hope of the AIG Tm to continue the success from last year's event where the conference produced increased tangible results and a clear action plan. For example, last year the units strongly emphasised the re-establishment of CoE visits by the AIG Tm in order to maintain proper oversight and improve training delivery. Over the last 12 months the AIG Tm has conducted eight CoE Visits, compared to only one over the previous 24 months.

Due to the varying levels of success at running the event in past years and the claim at the 2011 conference that the standard of gunnery was diminishing, the AIG Tm attempted to increase the profile and prestige of the event by moving it away from CFB Gagetown and therefore perhaps attracting higher attendance (we specifically targeted greater infantry participation). The three-day event was held in London, Ontario, and leveraged the immense interest in the LAV Upgrade by making a field trip to General Dynamics Land Systems - Canada (GDLS) in order to view the hull and the turret during the production phase. There was a 50% increase in attendance from 24 in 2011 to 36 in 2012.

The first day comprised AIG Tm updates on major projects and unit presentations on the status of gunnery training at their units. Day two was a field trip to GDLS where delegates received a detailed presentation on the LAV UP, with an emphasis on its lethality and the turret itself. Delegates also received briefings on the latest trends in AFV design and toured the massive and impressive plant. On day three, Directorate of Land Requirements (DLR) provided briefings on the Family of Land Combat Vehicles (FLCV), namely TAPV, CCV, LV-CTS, and Leopard II, and their impacts on gunnery training. Delegates

also participated in an Army Direct-Fire Specialist (ADFS) working group where the AIG Tm conducted a needs assessment and made proposed changes to the course. Lastly, the key issues discussed over the three day event were summarized and a consensus was formed on the way forward, with action plans developed for the AIG Tm and the units.

Much of the discussion centred on training issues and deficiencies that the field units experience when conducting Turret Operator Courses. These mostly stem from ignoring or avoiding the requirements within the Training Plan for the course to include: the tried and true 4:1 student to instructor ratio; 5-day mandatory course standardization; and the employment of an IG-qualified instructor to provide supervision and assess non-IG instructors. All issues have mirrored the observations of the AIG Tm during their CoE Visits over the last 12 months. There was a general consensus that these transgressions are having a negative impact on gunnery training and has greatly reduced the proficiency of new gunners and crew commanders across the Canadian Army. Although this may sound like doom-and-gloom in the gunnery world, most of the problems are easy fixes at the unit level.

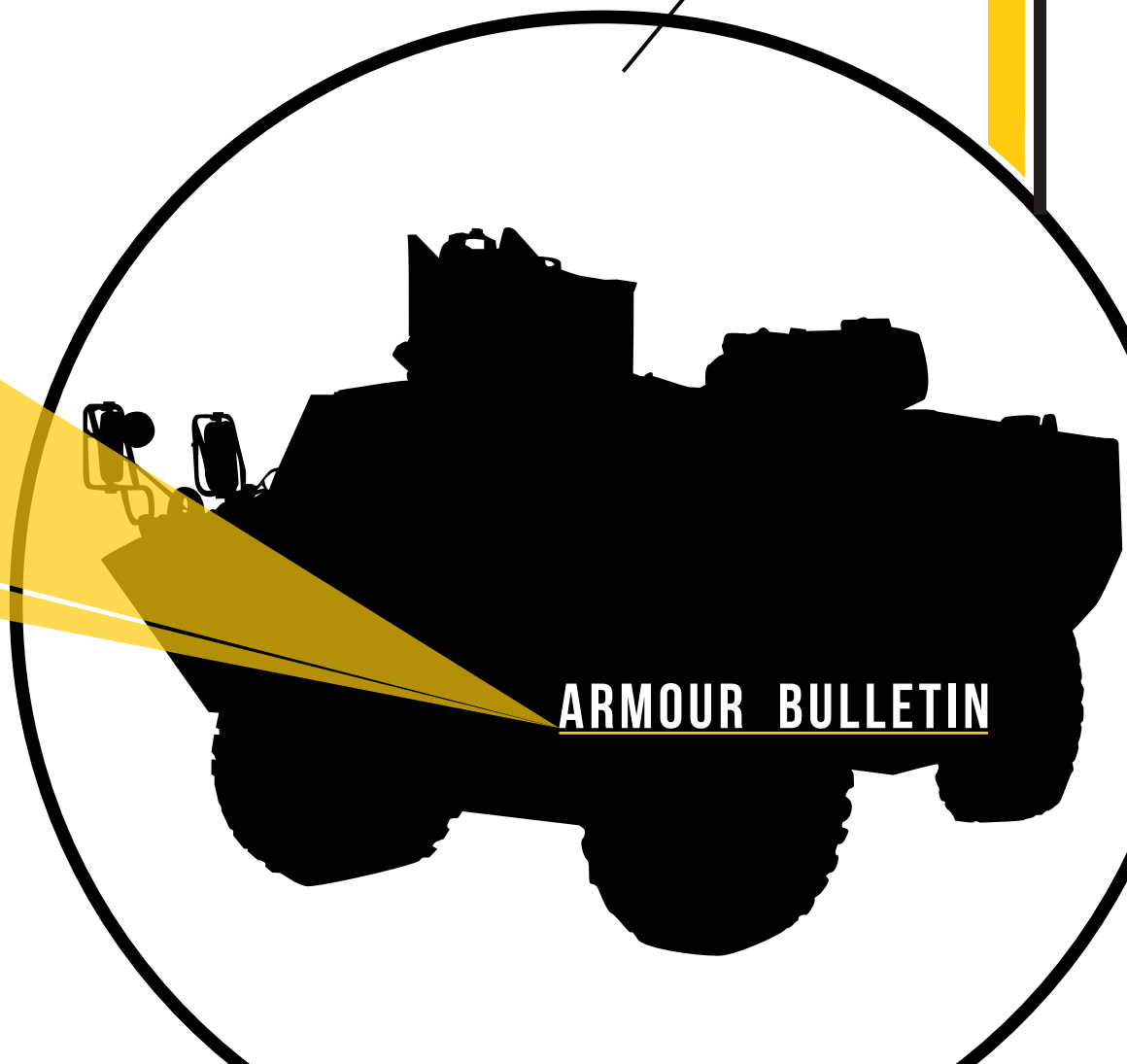
The rest of the conference covered a wide range of topics. This included the initial success of Leopard II initial cadre training (ICT) and conversion training at the Armour School; however, delays to the delivery of simulation and a sub-calibre training device (SCTD) will have impacts on future training. There was also discussion on the Precision Gunnery System (PGS) WES as an alternative to SCTD. The impact of the Worthington Challenge (see "The Worthington Challenge" in the Competition section) and the future of a Canadian Army Gunnery Competition also peaked unit interest. Units were encouraged to conduct more unit-level competitions in order to generate excitement about gunnery and produce more confident gunners. The LAV UP "simulation gap" (between vehicle delivery and deliver of LVCTS) and possible interim-solutions was the most heated debate; the AIG Tm attempted to paint a clear picture of changes in gunnery methodology as any solution will have less fidelity than then

current "high-fidelity" LAV Crew Gunnery Trainer (LAV CGT). The LAV CGT itself and its future sustainability were open to debate as anecdotal evidence suggests that the fleet is suffering serious reliability issues. However, currently the numbers do not reflect this, despite AIG Tm attempts to capture a more concrete assessment. Units were urged to track individual units during peak hours so that the longevity of the LAV CGT fleet can be better defined.

I would like to think that this conference had "less pointless arguing" and therefore accomplished more in terms of a "clear way forward" than previous events. However, the gauge by which success is measured is the action that takes place in the months after the conference itself, and that is yet to be determined. As for next year, the format will be largely the same, where the involvement of industry was seen as a point to sustain. However, it will be re-branded as the IG Working Group and the AIG Tm will seek Army funds to support, thereby ensuring greater unit participation. In the meantime, it's back to work, improving the "world of gunnery" one day at a time.

**Editor's Note: Considerable improvement has been made to the IG Conference in the last two years. It was resurrected in 2011 and given a new purpose as a liaison opportunity between DLR, industry and the Field Force on the gunnery front. This liaison is all the more important given the changes to direct-fire gunnery through the fielding of Leopard 2, LAV UP, the Tactical Armoured Patrol Vehicle (TAPV) and eventually the Close Combat Vehicle (CCV). This year's inclusion of gunnery related working groups has only improved the effectiveness of an already outstanding event.**

# ARMOUR RESERVE TRAINING



ARMOUR BULLETIN



## Decentralized Training for the Primary Reserve

Written By

Capt S. MacKillop and Capt S. Payne

There is a critical shortfall in the number of Armoured Reserve Crewman qualified as crew commanders. Tactical movement of a Combat Reconnaissance Vehicle (CRV) requires the direction of a trained crew commander for command and control purposes in a combat environment. While waivers may be granted to allow trained crew commanders to act as patrol commanders, the crew commanding qualification is a foundational skill necessary for safety. A shortfall in producing qualified crew commanders ultimately affects retention efforts for each Armour Reserve regiment as well as its ability to fulfill training and support requests. It directly impacts the subsequent generation of Sergeants and Warrant Officers, the back bone of any regiment and essential to commanding patrols. It is for these reasons that we advocate the decentralization of crew commanding

augmented course staff and assistance to ensure the course is executed to our well-established standard of conduct.

Funding constraints under our restrictive budget have forced prioritization of courses. Courses may have to be transferred from the Armour School to provide the funding base for decentralization to be successful. Transferring funding and increasing the support function of the Armour School will deliver refined training to the Primary Reserve units and achieve the necessary crew and patrol commanders for training and operations. Other avenues such as funding from the national budget hold another option to afford the standard number of Armour School courses for Canada-wide Armour regiments while still providing specific funding for decentralized courses.



Courtesy of SALH archives  
Patrol live-fire from the static position in Wainwright, AB during Exercise PRONGHORN GUNNER 1101.



Courtesy of SALH archives  
SALH preparing their patrols for a mounted night fire serial in Wainwright, AB, during Exercise PRONGHORN GUNNER 1101.

and patrol commanding to Armoured Reserve regiments.

The precedence has already been achieved by the 12<sup>e</sup> RBC (Reserve) who completed this training successfully over a series of weekends with support from the Armour School. Decentralizing crew commander training among the Western units will increase the pool of potential candidates by decreasing the amount of time required for soldiers to be away from their civilian employment. Standardization would come from the centre of excellence (CoE) at the Armour School with support from the Area Reserve Standards Detachment (ARSD). Staff at each unit would lecture soldiers in their home location, or using video conferencing and the See and Share program to lecture PowerPoint presentations. Field training exercises for the course would be integrated into the training year of the unit. Module 3 or other longer exercises would be coordinated with the Armour School for

Retaining qualified leadership will have significant impacts on the future strategic growth of the Armour Corps. The long-term benefits to the Western Armour units reside within the large number of crew commanders that will be produced for command and control, safety and retention purposes and to support the ability of units to effectively respond to training and operational duties.

**Editor's Note: At the heart of this article is the debate of centralized versus decentralized training. While there are key benefits and challenges to each option, the vital ground remains maintenance of the standard and sustainment of skills within the Armoured Reserve units; both aspects are essential to the health and capability of the Corps. While there has been success through the provision of limited support to specific units, the cost effectiveness will continue to be disputed, especially in a fiscally constrained environment. Clearly, success rests on the ability of units and the Armour School to work together in order to achieve training and production objectives.**



## Decentralized Armour Reserve Training

Written by  
Capt D. Gray

The Primary Reserve DP3 Armour Reconnaissance Crew Commander Course (ARCC) is split into 3 modules. The first two modules are decentralized and may be taught at the Unit level but the final module is taught at the Armour School. While this enables the School to maintain the standard of crew commanding, as the Corps vital ground, it can hinder Reserve Unit training and force development. With a shortfall of qualified Crew Commanders identified at many units, the Reserve Units have developed a number of creative solutions to complete crew commander training on their own terms.

One such solution to this issue was implemented during the winter of 2012 by the 12<sup>e</sup> Régiment blindé du Canada (Militia) (12<sup>e</sup> RBC(M)). They successfully completed all three modules at their own unit with oversight and support from the Armour School and were able to qualify several new crew commanders. With the successful completion of this course run by the 12<sup>e</sup> RBC(M), other units have identified possible solutions to their manning issues which satisfies the increased flexibility some of their students require. The South Alberta Light Horse (SALH) in coordination from other Reserve Units from the Western Area are now trying to capitalize on the success of 12<sup>e</sup> RBC(M) and run their own decentralized ARCC.

One of the key difficulties in exporting training from the Armour School is instructor and course standardization. At the Armour School, every effort is made to conduct standardization prior to the course to ensure the instructors are adequately prepared. With the implementation of the Armour School Instructor Course (ASIC) run this year at the School, we have ensured that all instructors receive continual instruction on the best methods to coach and mentor and ensured that all instruction is standardized. This can be difficult to achieve with dozens of Reserve Units placed across the country.

Another issue is that with the limited resources of Reserve Units, this level of training can be difficult to achieve. In this case, pooling resources and training requirements appears to be the best solution. The SALH intent is to pool the resources from other Reserve Units to ensure they can effectively deliver the training and ensure that they have the proper student course load.

Finally, there is the issue of authority. The Armour School has been proactive in this regard by providing limited course staff and standards oversight to enable units to meet training aims without officially decentralizing the course. Although not without its challenges, the end-state of generating more crew commanders among the Armour Reserve is worth supporting. Exportation of ASIC training is also under investigation to maximize the potential of training delivered at the Units.

**Editor's Note:** Force generation in the Armour Reserve, especially crew commanders, is hampered by the requirement to conduct training at the Armour School. Given that crew commanding is the Corps vital ground, there is a natural reluctance to completely decentralize this training to any unit (Regular Force or Armour Reserve). That said, every opportunity to support the Armour Reserve in the completion of this qualification needs to be explored. While not always the most cost effective way to deliver training, consideration must be given to the training availability of the Armour Reserve.





With the limited resources of Reserve Units, executing a complete Crew Commander course can be difficult to achieve. Pooling resources and training requirements appears to be the best solution.



## Tactical Armoured Patrol Vehicle (TAPV) Distribution and the LUVW

Written by  
Capt M. Kaye



The Light Utility Vehicle Wheeled (LUVW) or G-Wagon as it often referred as is the only mechanized platform that the 18 Armour Reserve Reconnaissance units have and it is the only mechanized capacity of the Reserve Brigades. It is readily accessible to all the Armour Reserve units and is an excellent platform in support of a wide range of tasks and Domestic Operations (DOMOPS) in particular. The LUVW is also the standard "jeep" for overseas deployment within permissive theatres of operation. Keep in mind that the LUVW saw extensive service during early rotations in Afghanistan and was used extensively during Op HESTIA in Haiti.

Courtesy of Sgt C. Morissette, Canadian Forces Combat Camera

Members of Canadian Forces and Royal Canadian Mounted Police are conducting a presence patrol in the town of Argandab located a few kilometers from Camp Nathan Smith.

Due to age and numerous limitations, the LUVW is destined for divestment in the near future. The LUVW Command and Reconnaissance (C&R) has been excluded from this for the time being which will provide the CF with an opportunity to identify a replacement for the LUVW. There are currently 253 LUVWs divided amongst the 18 Armd Reserve Units (see the article of LUVW Replacement).

For expeditionary operations, the Tactical Army Patrol Vehicle (TAPV) will provide the capability currently filled by the LUVW and other support vehicles. Given the TAPV's role in support of future operations (both permissive and non-permissive), the Army has decided to distribute a training pool of up to 27 TAPVs to each Area Training Centre (ATC). Although there is tremendous interest to have TAPVs on the armoury floors of Armour Reserve units, there are limited numbers and a wide Reserve audience to be served from Military Policy, CIMIC, PSYOPs, Infantry as well as Armour. Options related to distribution are typically reduced to matters of service support – namely how TAPV will be supported wherever they are distributed. While distribution to individual units would aid training and maintenance of skills, there would be a conspicuous lack of maintenance support and insufficient vehicles ready to support larger collective training (i.e. Troop/Platoon and above). While this leads to the conclusion of centralization with the ATCs, the Areas are not necessarily equipped to support such significant fleets nor are the ATCs always geographically situated to enable the training of all its Reserve units.

While much work remains to determine the best distribution for the TAPV, the necessity of the LUVW (and LUVW Replacement) is all the more clear. Regardless of the distribution option, the Armour Reserve needs a readily accessible vehicle capability to enable their training in mounted warfare.



Courtesy of Cpl L. Brunet, Canadian Forces Combat Camera

The G Wagons are used to provide tactical transport for command and control, liaison, military police and reconnaissance.



Courtesy of MCpl R. Bottrill, Canadian Forces Combat Camera

Canadian Forces G Wagons patrol through a neighbourhood in Kandahar, Afghanistan.

## Training Tomorrow's OCs – Reserve Armour Recce Squadron Commander Courses

Written by

Maj D.A. Hone and Maj T.S. Halfkenny

The Reserve Armour Recce Squadron Commander Course (ARSC), like the Combat Team Commander Course (CTCC) for the Regular Force or the Infantry Dismounted Company Commander Course (IDCCC) for the Infantry Reserve, is the formal training in preparation for employment as a Reserve Recce Squadron Commander. This course saw a hiatus between 2006 and 2011 due to lack of support. Following an extensive re-write, it was reinstated in 2011 to assist in the development of Reserve Armour Officers.

A logical question is whether or not there is a need for this course? Clearly there was a lack of focused requirement from 2006 to 2010 and some argue that a Reserve Recce Squadron Commander never really commands a squadron. While this is the perception, it is clearly not the case. A Squadron Commander needs that breadth of understanding at the squadron level and in support of a brigade to support a wide range of contingencies, support to domestic operations being paramount.

The current construct of the course is based on distance learning (DL) and a two week residency. The DL is approximately nine days of training delivered over several months, in this case from September to November 2012. In addition to reconnaissance theory review, students complete assignments and teleconferences aimed at sharpening their analysis and planning skills. In particular, emphasis was placed on the combat estimate at the squadron level. Although the DL does not require much in the way of resources, it was supported by experienced instructors from the Royal Canadian Dragoons, Tactics School, Armour School, and the 1<sup>st</sup> Hussars.

The residency portion is fast-pasted with 12 consecutive training days wherein tactical skills are tested. The 2011 serial of the ARSC relied solely on tactical exercises without troops (TEWTs) and computer assisted exercises (CAXs) to simulation commanding a squadron while this serial was conducted initially in simulation and then in the field. Doing so required a considerable amount of resources to train all 14 students and the RCD proved up to the task.

The RCD had been tasked to support the Tactics School in the delivery of this serial. Leveraging this opportunity, they conducted a regimental-level exercise that employed three recce squadrons and a host of enablers from 2 Canadian Mechanized Brigade Group and the American 1-71 Cavalry. Each evening saw the Sqn consolidating at a central location to allow the student who had been doing battle procedure and planning all day to deliver their orders for the next day's trace. Throughout the field portion each student had the opportunity to conduct at least two traces as the OC of the Recce Squadron and when they were not in the hot-seat, they had a chance to work with the SSM and see how much work is involved from the echelon's perspective; refuelling the Sqn, conducting casualty evacuations and replacements, and ensuring that the fighting troops have all the beans and bullets they need to get the job done.

The RCD was very supportive throughout the course and conducted an outstanding field training event. There is little doubt that this will be a formative experience in the development of these 14 squadron commanders.

**Editor's Note:** Like other training at this level, there is a desire to fuse courses with unit-level training to benefit both the unit and the students. This year's approach has seen great success with the Combat Team Commander Course / 1 Canadian Mechanized Brigade Group and now the Armour Recce Squadron Commander Course / RCD.

## RCD Support to the Reserve Recce Squadron Commander Course

Written by  
Maj R.M.R. Morin

The Royal Canadian Dragoons (RCD) were tasked to support the Armour Reserve Squadron Commanders Course (ARSCC 1201), from 24 September to 23 November 2012, in order to enhance the training delivery of the Primary Reserve Armour Squadron Commanders. Support to the ARSCC was enveloped as part of a Regimental training event, Ex CHARGING DRAGOON, embedded into the RCD annual Operating Plan.

This training event was conducted in three distinct phases for the 14 students. Distance Learning from 23 September to 9 November which was facilitated by the RCD Squadron Commanders as Directing Staff (DS), conducting weekly assignments and teleconference discussions. Garrison activities from 12 - 17 November to include Tactical Exercise Without Troops (TEWT) and computer aided exercises (CAXs) based on GUARD and SCREEN tasks. Finally the students and the Regiment participated in a six-day field training exercise (FTX) from 18 - 23 November throughout the rural manoeuvre area (RMA), conducting doctrinal reconnaissance tasks with a RCD Limit of Exploitation in the vicinity of PERTH / STITTSVILLE.

An added bonus for the students was the exposure to enablers and attachments not normally seen at Squadron and Regimental levels within the Reserve Community to include six Forward Observation Officers / Forward Air Controllers (FOO/FACs), fast air sorties, Fire Support Coordination Cell (FSCC), Surveillance and Target Acquisition Coordination Cell (STACC), All Source Information Cell (ASIC), two engineer light recce detachments, the Engineer Support Coordination Centre (ESCC) and Influence Activity enablers from Central Area to include partnered American support from 1-71 Cavalry in Fort Drum. Finally the imposed time and space considerations onto battle procedure and the execution of tasks was a great learning tool for these Squadron Commanders who commanded their Recce Squadrons on multiple traces throughout the exercise.

The ARSCC not only benefited the students but was also an exercise for the entire Regiment. Three Recce Squadrons, Headquarters Squadron, Regimental Headquarters and all the enablers deployed to the RMA. Core competencies were exercised, communication integration capability was tested, and doctrinal recce tasks successfully executed. The initial deployment saw the Regiment conduct four days of zone recces, a day of rear area security tasks, convoy escort and the deployment into a screen by night. The exercise culminated with a withdrawal under pressure. Squadrons were subjected to a strenuous tempo given the pace of the course as two complete sets of squadron orders were issued daily. Down to the troop level, patrols and crews were given an excellent opportunity to hone their recce skills, standing operating procedures and drills in an environment that challenged them from both a C2 and communication perspective.

In all, there were multiple levels of training throughout the exercise. The students departed having been afforded the opportunity to command a Recce Squadron throughout the battlespace and gained a better understanding of the time and space challenges that the Recce Squadron faces. Bold and Swift.

**Editor's Note: This serial of the ARSCC serves as an example of how a move to exporting and/or decentralizing traditional School house courses can be leveraged to achieve multiple training objectives.**



The course photo for the Armour Reconnaissance Squadron Commander course serial 1201.

# COMPETITION

The image features a stylized, high-contrast graphic design. At the top, the word "COMPETITION" is written in a large, bold, black, sans-serif font, set against a semi-transparent red rectangular background. Below this, a large black silhouette of a tank is positioned in the lower right, partially enclosed by a thick black circular line. To the left of the tank, there is a silhouette of a tree. The entire scene is overlaid with various geometric shapes: a large, semi-transparent red shape on the left, a vertical red bar on the right, and several thin black lines, including a prominent diagonal line crossing the tank and a horizontal line underlining the text "ARMOUR BULLETIN".

ARMOUR BULLETIN

## Sullivan Cup: Tank Crews going for Gold!

Written by  
Sgt F.J. Thibault

The Army Instructor in Gunnery Team (AIG Tm) had the opportunity to visit Fort Benning, Georgia, in May 2012 to observe the US Army tank crew competition, the Sullivan Cup. The aim of this visit was two fold: first, we wanted to understand the scope and obtain detailed knowledge of this event; and second, we wanted to foster relationships with US Army Master Gunners in hopes of conducting international gunnery competitions. I believe we accomplished both aims and we have set a precedent that will encourage gunnery competitions for years to come.

The Sullivan Cup is a four day competition with a focus on individual tank crews and a wide array of events that challenge a variety of armour crewman tasks and skills. The first day began with a two-hour physical test followed by maintenance challenges. Crews replaced track and exchanged several tank parts while being timed. That afternoon each crew member had to complete a main armament and secondary weapons handling test followed by a test on vehicle identification, which was very similar to our Armoured Fighting Vehicle Recognition level 1 exam.

The second day was composed mainly of evaluations in simulators with the crews being separated into drivers and turret crew groups.

The drivers completed a convoy escort simulation while the turret crews engaged targets in the simulator with judges scoring both time and accuracy. The day ended with crews bore-sighting and zeroing their vehicles on the range, again these activities were timed; this ensured crews that were confident in their skills would be the most successful.

The third day was spent at the range and started with a live-fire dismounted scenario of a casualty evacuation in a hostile environment. Nothing was held back in this scenario, which included battlefield simulated explosions under the supervision of a range safety staff. The afternoon focused on tank static shoots and included full NBC scenarios. The last day of the competition ended with a live-fire battle run with a vehicle engaging several static and moving targets.

The Sullivan Cup is a massive and impressive event and participation by the Armour Corps will ensure our tank crews are recognized for their outstanding professionalism and our ability to tackle any obstacle.



A portion of the live fire range during the Sullivan Cup. Crews were forced to dismount and react to the enemy situation.



Tank crews participating in the Sullivan cup are competing for time on maintenance tasks in Fort Benning.



## Inaugural Armour School Recce Skills Competition

*Written by*  
Capt A. Lambert and Capt D. Gray

This September, the Armour School had an opportunity to showcase some of their Reconnaissance skills and create some healthy competition between Squadrons. The first Recce Skills Competition was held on a rainy Saturday on the 22<sup>nd</sup> of September. The competition consisted of an austere field range conducted by the Army Instructor in Gunnery Team (AIG Tm) and a variety of dry stands which tested the patrols on various recce and crewman skills.

The range was designed to test a mounted Recce Patrol in a live-fire route recce scenario. This was an austere range in the southern portion of the training area and the planning process was excellent experience for the AIG Tm. This was a full field firing exercise without arc markers and targets located on the verges of the road. Additional dismounted mounted targets were located at prominent defiles and gaps for dismounted drills in order to challenge every member of the crew.

The stands consisted of a dismounted Recce patrol, a mass casualty scenario (MASCAS), weapons handling and a written exam. The Recce patrol saw the Patrol Commander receive orders and then was scored on his battle procedure, how he conducted the dismounted patrol, and the quality and quantity of information gathered at the objective. The MASCAS scenario had the patrol come across a scene with multiple injured personnel with the threat of an enemy and the patrol was scored on their scene management, tactical application, and first aid abilities. The written exam had questions pertaining to AFV recognition, D&M, comms and map symbols with each portion completed by a different member of the crew. The patrols were also tested on their handling drills of the 9mm pistol, C8, and C6.

Overall, this competition proved an excellent start-state and demonstrated the tremendous value of such competitions. Armour School staff, whom we often overlook due to the focus on students, will undoubtedly focus their training in preparation for next year's competition, thereby improving the calibre of the competition and inter-Sqn rivalry. The competition staff looks forward to expanding this event next year.

**Editor's Note:** *With the focus shifting from training for missions in Afghanistan, the time, space and interest in re-invigorating such competitions is needed. While this event was run solely for the benefit of the Armour School, next year will see inclusion of LFAA Armd PRes units. Perhaps there will be scope and opportunity to eventually graduate back to a Merit Cup.*



The Recce Patrol from A Sqn of the Armour School is performing a live-fire short defile drill when the dismounts come under fire from an enemy plus of the obstacle.  
Courtesy of Cpl N.J.M.E. Alonso



The winning Recce Patrol from B Sqn of the Armour School led by Sgt M.M. MacMillan receiving their trophy from the Commandant and RSM of the School.  
Courtesy of Cpl N.J.M.E. Alonso



A Recce Patrol during the competition is treating the injured in a mass casualty scenario while providing security from a possible enemy attack.  
Courtesy of Cpl N.J.M.E. Alonso



## The Worthington Challenge

Written by  
Capt A. Lambert



Courtesy of Cpl N.J.M.E. Alonso

Sgt Cory Bulmer and his crew fire their first round during the Worthington Challenge. Their tank, identifiable by the Armour School pennant, assisted the Armour School in winning the inaugural Worthington Challenge trophy.

The Armour School, as the Army's Centre of Excellence (CoE) for mounted direct-fire, hosted the 2012 Worthington Cup, a Leopard 1C2 Gunnery Competition that was incorporated into the Leopard 2A4 CAN Roll Out celebration. The three Regular Force regiments and the Armour School each provided a fire team to participate. Each team conducted two live-fire battle runs, each consisting of an array of main armament and secondary (COAX or MG) engagements. Scores were awarded based on accuracy and speed of engagement. The Army Instructor in Gunnery Team (AIG Tm) developed the format and rules based on the original Canadian Army Trophy (CAT), last held in Germany in 1991.

Overall, the event was three days. Day 1 consisted of teams signing and preparing vehicles for the range. Tanks were provided by A Sqn, Armour School, except for C Sqn, RCD, who brought their own. Next, teams received a formal and comprehensive brief on the format and rules. They also had an opportunity to spend time on the Leopard Crew Gunnery Trainer (LCGT). Day 2 saw the competitors deploy to the range

and conduct dry runs to better understand the sequence and range layout. Bore sighting and zeroing was completed but only one round was provided vice the typical five. Although some teams had just received their call signs, the AIG Tm decided that a well-trained crew given the proper bore sighting values only required the one round if their first round was within the inner circle (only one crew required to fire a second round). While controversial, we believe the results of the competition validated our assumptions.

Day 3 was the start of the competition. The live-fire battle run consisted of two static shoots and two battle runs in one seamless scenario. Each tank had 13 main armament rounds and a box of 7.62mm. All main armament targets

were presented as multiple engagements of four targets each to emphasize distribution of fire. The range of individual engagements was between 800 and 2000m. There were 22 main armament targets in total between the two tanks. All exposures were 40 seconds long putting pressure on teams with slow target acquisition. Some of the engagements were done hatches down to further challenge the crew's target acquisition. COAX engagements were only conducted during the mobile battle runs in



Courtesy of Cpl N.J.M.E. Alonso

After a successful competition battle run, a crew from the Worthington Challenge returns from the firing lane in preparation for their second run.



Courtesy of Cpl N.J.M.E. Alonso

The winning fire team of the first Worthington Challenge, from the Armour School, pose in front of their tanks with the Worthington Challenge trophy.

the form of falling plates. All falling plates were located in dead ground making them difficult to pick up until the last moment. The target array was certainly challenging which was the aim of the competition.

The winning team was the Armour School followed very closely by the visiting 12<sup>e</sup> RBC, LdSH(RC) and the RCD. One positive aspect was that each team dramatically improved their score on their second iteration despite a more difficult target array. The 12<sup>e</sup> RBC had the highest main armament score and highest individual battle run. The Armour School had excellent COAX shoots, fast engagements, and the highest overall score. While there may have been some disappointment and frustration across all teams, they all agreed it was an excellent event and starting point for future competitions.

What separated the teams? Was it training, experience, preparation, or the awkward situation where the visiting teams were borrowing vehicles and not using their own (and of course the latter compounded by an arguably unfair zeroing procedure)? All teams had virtually the same level of accuracy, between 69- 73%; this was simply calculated by taking

the number of targets struck divided by total rounds fired. And if you think this number is low, you are wrong; the short exposure times and multiple engagements added significant pressure and difficulty to the overall target array. The real disparity in terms of score boiled down to target acquisition and aggression; the top teams simply fired significantly more rounds and thus struck that many more targets. Aggression and the speed of target acquisition proved far more important than the zeroing procedure.



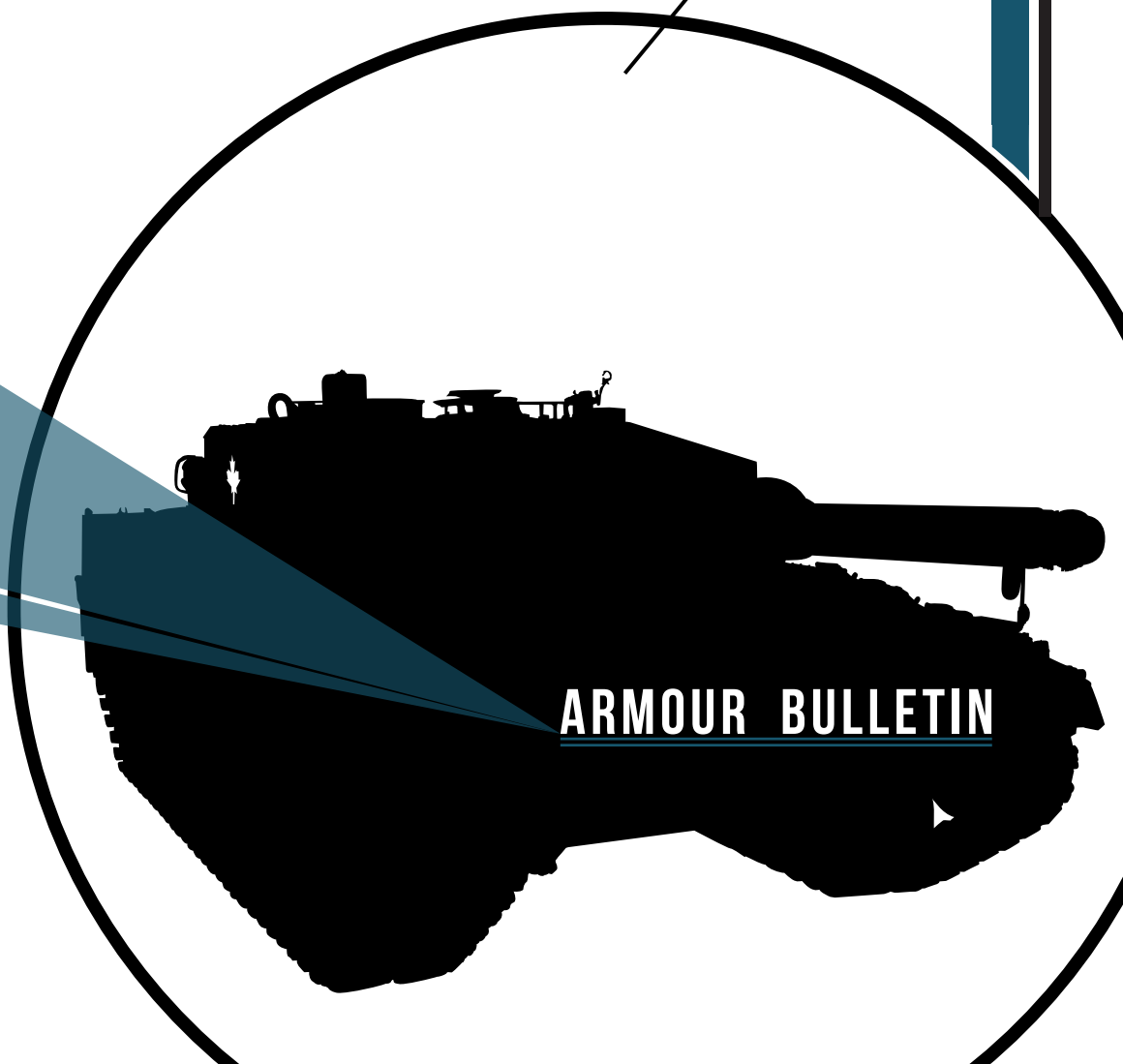
Courtesy of Cpl M.R.F. Elley

Lt Mike Bastien adopting the first bound position during the inaugural Worthington Challenge tank competition.

The planning process for next year has already begun and will follow a similar format. The idea is to keep the focus on gunnery and to adopt a troop-level competition in the future. I would like to thank all the participating crews and look forward to seeing you on the range next year.

**Editor's Note:** This is another example of a relatively low cost, high value competition that rekindles competition between the Regular Force Units. With initial Commander Canadian Army support given in May 2012, this style of competition will be expanded next year to the 25mm turret and a broader, Army audience. Of particular note is the value of ingraining aggression in our soldiers. While years of focus on counterinsurgency and reconnaissance may have dulled that edge, we do not need tanks to reawaken that spirit.

# LEOPARD 2



**ARMOUR BULLETIN**



# The Leopard 2A4 Canadian Introduction Into Service

*Written by*  
Capt K. Rosenkranz-Galindo

On 13 September 2012 the Armour School hosted the unveiling of the final Leopard 2 gun tank variant in an event known as the "Leopard 2 Introduction Into Service". This event involved every soldier at the School at some level and included a number of very important guests. Foremost, our Minister of National Defence, the Honourable Peter MacKay was on hand to observe the ceremony, conduct a media conference and mingle with the troops.

The event started to take shape on the morning of 13 September at CTC Gagetown's Firing Points 4 & 5. "H-Hour" was marked by the signature sound and ground-shaking feeling that only a tank can produce. Within seconds, two Leopard 2A4s appeared on each side of the stands. They engaged targets down range and started to conduct their battle run with a Troop-size demonstration of fire power and mobility. Some of the highlights seen during the event were the ability of the Leopard 2A4 to discharge their smoke canisters and accurately engage targets on the move while reversing. The event was followed by an address from the Minister, and a field reception where all guests, including the Minister had an opportunity to talk with all members present.

At the end of the day, every soldier present - regardless of trade or affiliation - clearly understood the capabilities and importance of the tank in the battlefield. The Armour School is looking forward to the commissioning of all Leopard 2A4 Canadian's and fielding complete by end-December 2013.

<sup>1</sup>Ottawa Citizen article 13 Sep 12 "Peter MacKay Announces Arrival of "Canada's New Next Generation Tank AKA the Used Leopard 2s Purchased Years Ago"



The Press conference layout for the Leopard 2 Introduction Into Service ceremony in the Gagetown Training Area  
*Courtesy of Cpl M.R.F. Elley*



Leo 2A4 CAN conducting a troop shoot with Service HEAT during the Leopard 2 Introduction Into Service Ceremony  
*Courtesy of Cpl N.J.M.E. Alonso*



Our government has a proven record of ensuring that the men and women of the Canadian Forces have the equipment they need to take on the challenges they face. Our government's procurement of this impressive platform will ensure the Canadian Forces have the capability they need to support future operations.<sup>1</sup>

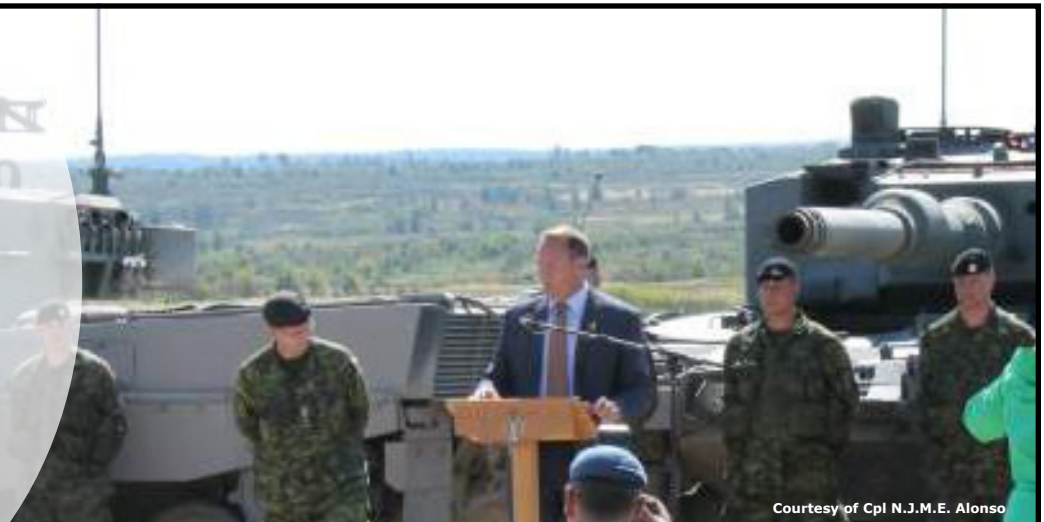


Photo of Hon P. MacKay, Minister of National Defence in front of the Leopard 2A4 Canadian with crew while addressing the guests and spectators present.  
*Courtesy of Cpl N.J.M.E. Alonso*

## Leopard 2A4 CAN Enters Service

*Written by*  
 Capt C. Duncan

The first group of Leopard 2A4 CAN completed commissioning at the Armour School in Gagetown on 6 June. These will be the last of the Leopard 2 variants to enter Canadian service next to the Leopard 2A4M and Leopard 2A6M which have already seen extensive service in Afghanistan. The Leopard 2A4 CAN, purchased from the Netherlands in 2007, will go through an extensive repair and overhaul process at Rhenmetall Canada in St-Jean, Quebec before being commissioned at the Armour School. The Commissioning process allows a final inspection of each tank followed by confirmation firing. Once complete, each tank is accepted by the Army and then distributed to its unit.

With support from crews from the Lord Strathcona's Horse (Royal Canadians) and technicians from Rheinmetall Canada the commissioning process has been an outstanding success. Participants were greatly impressed with the accuracy and lethality of the 120mm and cannot wait for tactical training to commence.

As of the publishing of this article, 14 of 42 Leo 2A4 CANS have been commissioned in Gagetown with the remainder being completed in 2013. End-state distribution of this variant will be: 11 to the RCD, 20 to the LdSH(RC) and 9 to the Armour School .

Tremendous thanks are due to the LCol Perry Wells, Maj Mike Wionzek and the Tank Replacement Project Team for their outstanding work.



Courtesy of Cpl N.J.M.E. Alonso

After discharging a 120mm round down range in the CFB Gagetown training area, this Leopard 2A4 CAN main battle tank's main gun returns to the load position in preparation of firing another accurate and devastating round. During this first round of Leopard 2A4 CAN commissioning, all the tanks were verified to ensure that they were fully operational and exceptionally accurate.



Courtesy of Cpl M.R.F. Elley

Following two weeks testing, culminating with a live-fire examination, the Leopard 2A4 CAN stands ready for training in CFB Gagetown. After years of hard work, Leopard 2A4 CAN tanks are amongst the Canadian Army's fleet of vehicle and ready for any challenges ahead.



Courtesy of Cpl N.J.M.E. Alonso

The symbolic start to the new era of tank operations for the Royal Canadian Armour Corps as Cpl A.J. Elms (LdSH(RC)), Cpl R.E. Albert (12e RBC) and WO J.C. Moreau (RCD) prepare to fire the first remote round from a Leopard 2A4 CAN. After satisfying the requirements during the commissioning, the first group of six Leopard 2A4 CAN main battle tanks were accepted into the Canadian Army's fleet.



Courtesy of Cpl M.R.F. Elley

Successfully being commissioned into the Canadian Army, the Leopard 2A4 CAN will be a regular sight and sound around the CFB Gagetown area. With its 120mm Main Gun, the largest in the Royal Canadian Armoured Corps, the sound of students becoming qualified gunners will join the symphony of training area noises local residence have become accustomed to hearing.

## Leopard 2 Conversion Training - Shape of Things to Come

*Written by*  
Capt D. Gray and Capt M. Kaye

Although the Army has brought many vehicles into service before, lessons learned from the implementation of the Leopard 2 will greatly impact forthcoming implementation for Future Land Combat Vehicles (FLCV) such as the Tactical Armoured Patrol Vehicle (TAPV), LAV III Upgrade (LAV UP) and Close Combat Vehicle (CCV). This past year the Corps ran inaugural Leopard 2A4 driver and maintenance (D&M) and gunnery training. A lot of hard work was put towards ensuring everything was in place so that these courses would be ready in accordance with aggressive timelines. While very successful these courses were not without their lessons that should be captured for future vehicle implementations.

The Armour School ran the inaugural Leopard 2 D&M conversion course in July and August with eight students instructed on all three variants of the Leopard 2. The course material was sound and



Courtesy of Cpl M.R.F. Elley

The inaugural Leopard 2A4 CAN D&M courses learning how to replace the pack with the assistance of the ARV.



most of the effort was placed on refining the time allotted to each subject. Leopard 2 gunnery training in October was designed to convert already trained Leopard 1C2 crews on the Leopard 2A4. While the Armour School had all three Leopard 2 variants, there was a lack of simulators and training aids. In order to overcome the simulation gap, already qualified Leopard 1C2 crews were converted. However if we receive a vehicle for which conversion is not possible, the delivery of simulation and training aids prior to the start of a course becomes essential.

Overall, there has been a high level of excitement from both course staff and students with D&M and gunnery training finally beginning on the Leopard 2 tank. With the key lessons learned from the first courses training will continue to improve on future serials. In turn, this will enable the implementation of the remainder of FLCV.



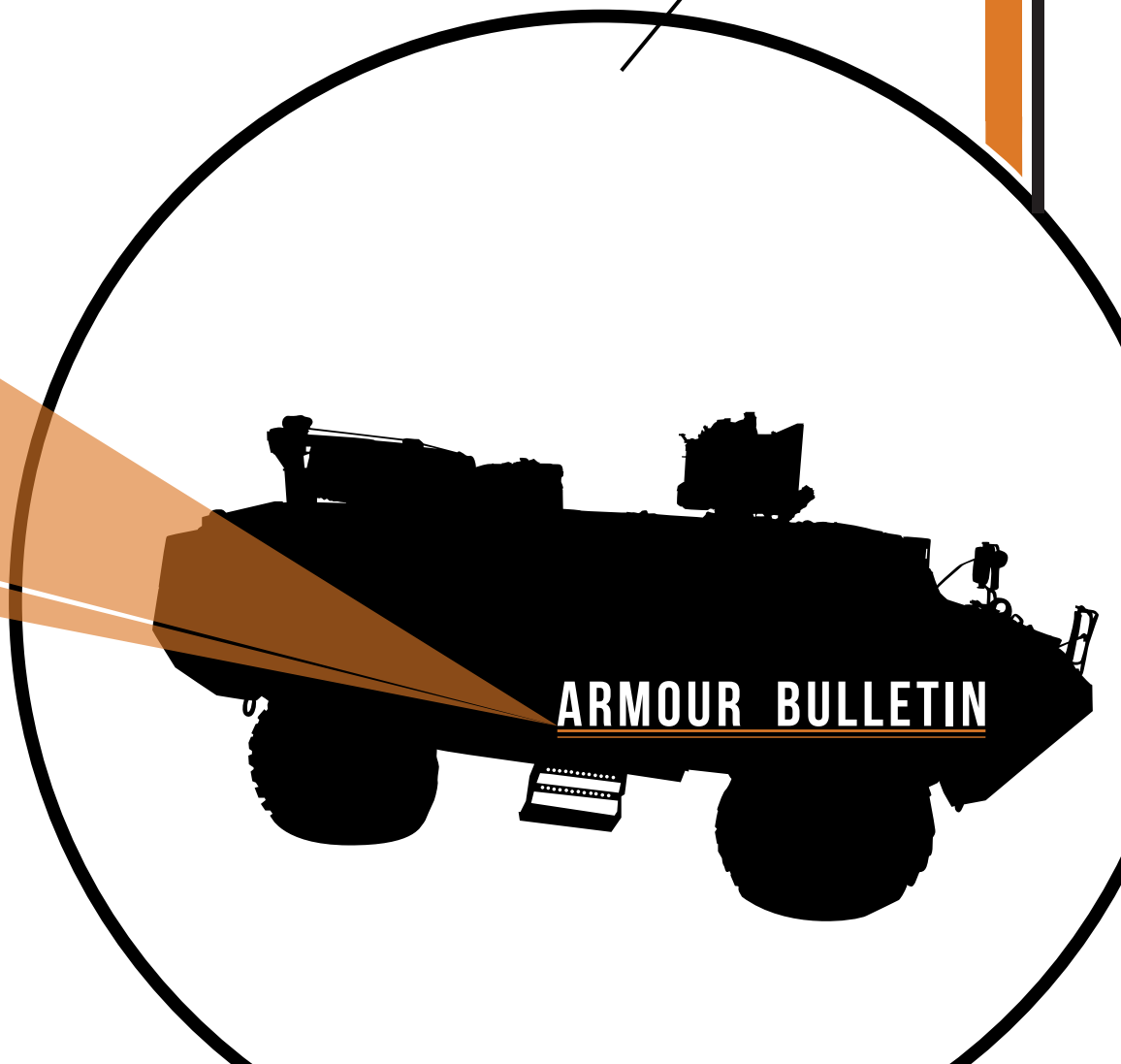
The inaugural Leopard 2A4 CAN gunnery course class photo.  
*Courtesy of Cpl M.R.F. Elley*



Leopard 2A4 CAN firing in the Gagetown training area during the Leopard 2A4 CAN inaugural gunnery course.  
*Courtesy of Cpl N.J.M.E. Alonso*



# NEW CAPABILITIES



ARMOUR BULLETIN



## Tactical Armoured Patrol Vehicle (TAPV)

Written by  
Project Management Office TAPV

On June 7, 2012 the Government of Canada awarded Textron Systems Canada Inc. (TSCI) contracts for the acquisition and long-term support of up to 600 Tactical Armoured Patrol Vehicles (TAPV). Specifically, the project will procure 193 Recce and 307 General Utility variants and, if funds become available, an option exists to procure an additional 100 vehicles (40 Recce and 60 General utility). The first vehicle is scheduled to be delivered to the Canadian Army in 2014 and the last delivery is scheduled for 2016. The new TAPV will enable the Army to field a modern fleet of tactical armoured vehicles for use in domestic and expeditionary operations that are highly mobile and will provide a very high degree of protection.



Sneak and peek? Future reconnaissance patrols will be based on a TAPV and a LAV Recce. Additional testing is required to determine the best way to employ these vehicles together in order to maximize the strengths of each.

Courtesy of Textron

The TAPV will replace the Coyote Recce vehicle and the RG31 Armoured Patrol Vehicle and will also complement the capabilities of the G-Wagon Light Utility Vehicle Wheeled. Timing is extremely important as the Coyote is currently operating at the limit of its capabilities, the RG31 has limited off-road mobility, and the G-Wagon is limited due to its inadequate protection; support costs associated with these vehicles are also escalating.

The TAPV will be employed in recce, surveillance, patrolling, and command and liaison tasks. The Recce variant will be configured for a driver, RWS operator, crew commander and one or two passengers. Primary users for the recce variant will be Armoured Recce Squadrons and Infantry Recce Platoons. The General Utility variant will be configured for a driver, RWS operator, crew commander and three passengers. Primary users for the General Utility variant will be Light Infantry Companies as well as deployed Task Force support units such as: National Support Element troops, Operational Mentor and Liaison teams, Provincial Reconstruction teams, Military Police patrols and Civil-Military Cooperation Teams.

A two-stage procurement process approach was used. For the first stage, the Solicitation of Interest and Qualification, potential bidders were invited to meet predetermined qualification criteria to be allowed to participate in a second stage, the Request for Proposal. As a result of this competitive process, seven companies were eventually pre-qualified to bid their candidate vehicles. These companies were free to enter teaming arrangements to respond to the Request for Proposal. The TAPV pre-qualified bidders were as follows:

Pre-Qualified Bidders	Contending Vehicles
BAE Systems Hägglunds AB, Sweden	Alligator 6x6
BAE Systems Land Systems OMC, South Africa	RG31 Mk5 EM
Force Protection Industries Inc, USA	Cougar 4x4
Nexter Systems, France	Cougar 6x6
Oshkosh Coporation, USA	Aravis
M-ATV	Mobile Survivable Vehicle (MSV)
Thales Australia	Bushmaster

Ultimately, four of the bidders submitted proposals for the TAPV. These vehicles were then put through an extensive and demanding physical testing and evaluation process with 70% of the points being awarded for technical requirements and 30% for the price. The physical testing was conducted at the US Army Aberdeen Test Centre in Autumn 2011 and included tests on firepower, human-systems integration, mobility and blast protection. In the end, the TSCI TAPV received the most points for technical performance and, combined with an aggressive price, emerged as the clear winner.

The Textron TAPV balances increased mobility with high levels of protection. The vehicle's comprehensive blast protection system includes a V-shaped hull, energy absorbing belly armour, a monocoque design, vented wheel wells, significant ground clearance and a wide stance for added blast



The Tactical Armour Patrol Vehicle (TAPV) Recce Variant will have a crew of four with space for an additional passenger. The armament will be a Kongsberg Remote Weapon Station (RWS) capable of mounting a 7.62mm machine gun and the 40mm Automatic Grenade Launcher. While crew protection was the vital ground for this project, mobility is a key concern for the end user. Of the vehicles competed, the TAPV provided the best overall manoeuvrability.

Courtesy of Textron

resistance. To further increase crew survivability the vehicle is fitted with multi-hit, mine-blast-protected seats. Testing has confirmed that blast and ballistic protection levels are equal to those of an MRAP vehicle.

Mobility is another feature of the Textron TAPV. The Textron TAPV has demonstrated good off-road and urban manoeuvrability. In addition, the TAPV is designed with a focus on ergonomics and interior layout options for multiple mission capabilities. This allows the vehicle to be configured for patrol, convoy protection, ambulance or personnel carrier missions.

Lastly, the Textron TAPV mounts a Kongsberg PROTECTOR Remote Weapon System (RWS). The TAPV RWS mounts the C16 40mm Heckler and Koch Automatic Grenade Launcher, a 7.62mm C6 General Purpose Machine Gun and four 76mm smoke dischargers.

Out of four very solid contenders, the TSCI proposal obtained the highest overall score during the evaluation and represents a low-risk, production-ready solution which meets or exceeds 100% of the Canadian Army's requirements. The Textron TAPV features superior off-road and urban mobility, advanced ballistic and blast protection, weapons lethality, enhanced crew comfort and ergonomic design, an open architecture digital data network, large payload capability, and enhanced durability, maintainability and reliability.

**Editor's Note: The TAPV and the LAV Recce will complete the transformation of our Armoured Recce Squadrons. In addition to the tasks noted here, the Armour Reserve will employ the TAPV as part the Forward Support Group's Recce Troop, essentially the convoy escort Troop for sustainment convoys. Deployment into a non-permissive environment will have the Army lean heavily on TAPV to provide crew protection for a wide range of operators and enablers. Unlike the RG-31, real attention now needs to be paid to the scope of Armoured Fighting Vehicle (AFV) training throughout the Army, especially if enablers are to be expected to crew and fight the TAPV.**

## Familiar Platform; New Capabilities and Challenges

*Written by*

Sgt L. Chevalier-Boisvert and Sgt C. Keith

The modernization of the LAV III, known as the LAV Upgrade project (LAV UP), is entering its final phase. Having had the opportunity to participate in live-fire product testing, which took place in Nevada this past September, the Army IG Tm now has a full appreciation of the changes to come in the LAV UP turret.

The new thermal imaging system, called IRTAS (Infra-Red Target Acquisition System), allows the crew to positively identify enemy vehicles at a greater distance. This system is coupled with an improved version of the Fire Control System (FCS) and turret processors (TP) to obtain a ballistic solution in super-elevation and lead angle. The product of these new systems is the "lay" function. This new capability takes into account distance to target, strength and direction of the wind, altitude and temperature of the ammo as well as that of the outside air. A better hit probability than the legacy turret was proven during live-fire testing, with all targets within our engagement ranges hit with initial bursts.

To add to the superiority of the new turret, the Field of View (FOV) for the IRTAS has been upgraded to include a 14x using narrow FOV and 28x using the 2x narrow FOV function. The thermal rendering provides a never before seen level of image clarity in the infra-red spectrum, even under extreme hot or cold conditions. A new day camera and II sight have been integrated to the crew commander head sight with a panning option of up to 21x. The Crew Commander Tactical Display (CCTD) allows the crew commander to easily toggle between all viewing options with a selector switch.

Part and parcel to this new configuration, are new problems; with the fielding of the LAV UP and Land Vehicle Crew Training System (LV CTS) projects, the AIG Team has identified a significant simulation training gap. Given the obsolescence of the LAV Crew Gunnery Trainer (LAV CGT) simulators, their incompatibility with the LAV UP and the reliance of simulation as part of our current approach to gunnery training, there is a necessity to create an interim solution to satisfy the training needs of this new platform. Possible solutions for this deficiency have already been proposed by industry; known by the Army IG Tm as the Interim Crew Gunnery Trainer (ICGT). The majority of discussion has been centered on a desk top trainer which will need to leverage software and touch screen technology. It would ideally have potential to simulate other vehicles and have key peripherals such as proper hand controllers while maintaining portability. Regardless as to how this problem is solved, the ICGT will remain a keystone in reaching the implementation, individual and collective training goals of the Army.

A joint venture implementation team, staffed by both the AIG Tm and the Inf Sch, is in the process of being stood up to support and provide continuity for the testing and integration of the LAV UP. This team will be responsible to their respective Centers of Excellence, but will work in conjunction in order to negate double efforts. The first LAV UPs are scheduled to arrive at the Centers of Excellence as soon as early as Summer 2013, with Initial Cadre Training to take place sometime in the Fall of that year. From there, the Army IG and LAV UP implementation teams will have a long road of trials, training and implementation ahead.



## LAV RECCE

Written by  
Capt D. Saucier



Courtesy of Department of National Defence

Light Armoured Vehicles (LAV) III undergoes testing activities at Canadian Forces Base Gagetown. These vehicles were built to test the various upgrades that are planned for the fleet as part of the LAV III Upgrade project.

The Light Armoured Vehicle Reconnaissance Surveillance System Upgrade Project (LRSS UP, aka LAV Recce) continues to make strides towards delivering an up-to-date Ground Manoeuvre Reconnaissance platform to the Army. The project will deliver 66 x LAV RECCE vehicles, which will have a new LRSS integrated into a LAV UP chassis. In addition to the procurement of an enhanced surveillance suite, the new LAV RECCE will incorporate a reconnaissance on-the-move (OTM) capability, whereby the vehicle will be capable of travelling with the mast and sensor suite deployed. Also, as another improvement over its predecessor, the LAV Recce will be comprised of a dual-purpose surveillance suite, which includes both the remote and mast kit in each vehicle, providing the Recce Squadron with invaluable flexibility.

Since the last LAV Recce article published ("The LRSS UP and the Future of GMR" by Maj F.Z. Lozanski, 2010 Armour Bulletin), we have entered into the Definition Phase and there have been several minor changes to the project. These minor changes provide the potential for a significant capability upgrade from what was originally proposed in 2010, all while remaining within our allotted budget.

Doctrinally, reconnaissance troops understand the requirement for long-range, beyond line-of-sight communications. The Army has also recognized this capability gap and is investigating the possibility for satellite communication on the move (SOTM), which we intend to include in the LAV RECCE. This capability will support our requirement to operate within the Formation (and higher) area of operations without reliance on radio rebroadcast (RRB). We are also investigating the possibility of purchasing a completely new radar system which will be integrated into the the rest of the sensor suite. A third minor change could be the refinement of requirements to include the possibility for a short-wave infrared (SWIR) sensor. This requirement was initially stated as a need for a low-light imager; however, with the rapid advances in technology over the past few years, we discovered the feasibility of the SWIR. This sensor would not only satisfy our requirement, but it would also provide us additional flexibility in sensor utilization, as the SWIR performs effectively in daytime, low light, no light, and bad weather conditions.

Over the next year, we will be conducting several studies to refine our requirements, thus ensuring the best possible reconnaissance and surveillance system for the Armour Corps within our allotted budget. One of the most important studies being conducted is a silent watch evaluation, where we will be testing the feasibility of incorporating lithium-ion batteries and/or a diesel-powered Auxiliary Power Unit (APU) into the new LAV UP chassis. The results of this study will help ensure that we ask for a power system that is state-of-the-art, yet financially feasible and tactically sound.

A second important study that we will be conducting is a human factors engineering trial where we will evaluate the optimal seating arrangement for the Surveillance Operator (Surv Op) in the back of the LAV RECCE. This test will ensure that the Surv Op can comfortably operate the Operator Control Station (OCS) while on the move.

We will be conducting a third study on the optimal configuration of the back deck of the LAV RECCE. Several factors will be considered, such as minimizing fire inhibit zones and communication radiation emissions to the exposed crew, as well as the maximization of fields of view for the surveillance system while on the move.

Although time-consuming, these studies are very important in ensuring the best system is provided to the Armour Corps and the Canadian Forces in general. The LAV Recce team is working diligently on moving this project through the procurement process, with hopes to deliver the first vehicle in early 2016. Until then Armour Corps, continue refining your reconnaissance and surveillance skills as we guarantee this new capability will be sure to impress.

**Editor's Note:** While the LAV Recce will provide a significant technological improvement to the current Coyote, it comes at a cost of significantly fewer vehicles. The composition of an Armoured Recce Patrol will need to be amended to include both the Tactical Armoured Patrol Vehicle (TAPV) and LAV Recce ("The Reconnaissance Troop of the Future" by Capt P.L. Nicolas, 2011 Armour Bulletin). The changing nature of the Patrol and the new, impressive capabilities of the LAV Recce will require a shift in many of our tactics, techniques and procedures (TTPs) as we re-orient for future tasks.



Courtesy of Department of National Defence

The LAV III Upgrade Project will improve the LAV 3s' protection against mines and improvised explosive devices, improve their mobility, improve the safety of Canadian Forces members travelling on board, and incorporate ergonomic and information management improvements.

## LUVW Replacement – A Major Issue for the Reserves

Written by  
LCol P. Halton

The LUVW has been described as part of a “self-divesting fleet.” This is an unenviable but familiar position for Reserve armoured reconnaissance (Armd Recce) units to be in, given that it is our sole “F echelon” platform. A similar situation occurred with the Iltis, where their rust-out outpaced their replacement, leaving a gap that negatively affected training and deployability for domestic operations.

Despite a number of high profile capital projects underway to reinvigorate the existing armoured fleet (LAV UP, CCV, TAPV, etc), none of these vehicles will be held by Reserve units, nor readily available to them for anything other than training at centralized locations in each Area.

The Reserves will continue to play a key role in domestic operations in future. For Reserve Armoured Recce units to contribute to such operations in a meaningful way, they must have access to a domestically deployable platform. These vehicles must exist in sufficient numbers within each unit to allow them to mount a response in case of an unplanned domestic operation within their local area.

This vehicle need not be as robust as any of the major acquisitions noted above. In fact, in terms of maintenance and the training bill to retain currency, it must not be as complex. It must, however, be more capable than the current fleet of B vehicles which is often used to replace LUVWs on a local basis.

Using the five operational functions as a guiding structure, the general requirements of such a vehicle could be described as follows:

Operational Function	Requirement
Command	- 1 x tactical radio per vehicle with min. 2 headsets - dual tactical radio installations in command and LO vehicles
Act	- cross country capable - capable of carrying four crew members and their equipment
Sense	- 360 degree viewing by crew to allow use of binos and LRF - Possibly capable of being “top down” to facilitate local SA - potential for mounting of in-use surveillance gear (i.e. NODLR)
Shield	- soft skin - must protect crew from vehicle rollovers / collisions
Sustain	- capable of self recovery (ie winch?) - should have a trailer to increase self sustainability



Courtesy of Sgt N. McLean, Canadian Forces Combat Camera  
Corporal José Lauzon, Military Police from Canadian Forces Base Valcartier Quebec explains the military involvement with respect to their response to the floods in Montérégie, Québec in front of this Military Police pattern LUVW.



Courtesy of MCpl Y. Proteau, Combat Camera  
Iltis light utility vehicles on patrol in Kabul in February 2004.

It would be fiscally irresponsible to purchase and distribute a vehicle such as this, and not consider how it would be used for other than domestic operations. A vehicle with the capabilities described above, with perhaps the addition of a pintle mount, would serve well for general purpose combat training. I hesitate to add the caveat that the vehicle would never be expected to deploy overseas, given the Corps’ collective experience with the Cougar, but it should not be purchased with an international role in mind. Kept simple, sufficient numbers could be purchased that would allow for squadron level training that would keep skill-sets alive that would wither should we have a smaller number of more capable vehicles.

Experience has shown that a doctrinally structured and equipped Reserve Armd Recce sqn is a highly robust and flexible tool for domestic operations. Its ability to move long distances rapidly, observe large areas of terrain, communicate internally and to higher headquarters, and sustain itself is unique within the Reserves. The capability of such a sub-unit could perhaps best be understood by

comparing it to the domestic deployment capability of the average Reserve infantry unit – which consists largely of unsupported troops travelling by rented yellow school bus.

A wisely chosen Reserve domestic operations vehicle would represent a very favourable return on the investment made. Besides better aligning Reserve capability with the Canada First Defence Strategy, it might also sustain the ability of the Reserve Armd Recce units to train themselves for all roles for many years to come.

**Editor’s Note: The Armour Corps is currently investigating LUVW replacement with a view of procuring and modifying a commercial off-the-shelf (COTS) or military off-the-shelf (MOTS) that meets the requirements outlined above. Like the GMC Silverado “Milcot” truck, it is possible to procure an inexpensive vehicle that provides a wide range of capabilities. It is imperative that the Armour Reserve be provided with a capability that, unlike TAPV, resides on the Armoury floor and is ready for use. This will represent the only integral “mechanized / motorized” capability for the Reserves when supporting domestic operations. The Armour Reserve requires a vehicle capable of maintaining both mounted reconnaissance skill-sets while supporting the domestic operational environment. If the tentative list of minimum mandatory requirements noted above are embraced, the Armour Reserve community will have a solid “mount” to see it well into the future.**



## LUVW Replacement Requirements

Written by  
Army Driving and Maintenance Team

Working closely with several Armour Reserve units, and based on the "LUVW Replacement" article by LCol Halton, the Army Driver and Maintenance Team (AD&M Tm) has spent some time expanding on the requirements for this future vehicle. As this initiative proceeds, a clear definition of the mandatory and desirable requirements will help ensure that the Armour Reserve is provided with a vehicle that meets its needs.

Requirements are typically subdivided between mobility, survivability, effects, information and human dimensions. The following are general assumptions that contributed to initial requirement definition:

<p><b>Mobility</b></p> <p>The vehicle needs to be able to operate easily on civilian roads and highways but must also retain a limited cross country capability.</p> <p><b>Survivability</b></p> <p>The crew needs to be protected in the event of a roll-over. As there is no intent for this to be a deployable vehicle, there will be no consideration of reducing the vehicle signature (acoustically, visually or thermally), no additional ballistic, blast, incendiary or mine protection, no add-on-armour and no consideration for CBRN protection.</p> <p><b>Effects</b></p> <p>Intent is to use in-service weapons with no desire to purchase new or unique weapons. There would be no optics provided with the vehicle.</p>	<p><b>Information</b></p> <p>Vehicles need to be Land Command Support System (LCSS) enabled. Intent is to use in-service communications equipment.</p> <p><b>Human Dimension</b></p> <p>Vehicles have to be capable of holding a standard four person crew with all their equipment. Ingress/Egress needs to be simple and unobstructed for each crew member.</p>
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Mandatory requirements are essential capabilities of the vehicle, as typically outlined in the Statement of Operational Requirements (SOR) of any project. The tentative list for LUVW replacement consists of the following:

<p><b>Mobility</b></p> <p>Diesel engine and an automatic transmission. It should be either 4x4 or 6x6 capable depending on the number of axles. A front and/or rear mounted winch should be provided to enable self-recovery. It should be mounted with a trailer hitch to include a military variant and standard ball (civilian) version. It should have a sufficiently side wheel base to reduce the possibility of roll overs (e.g. better than LUVW).</p> <p><b>Survivability</b></p> <p>The crew compartment should be suitably protected in the case of a vehicle roll over. There should be heavy bush guards on the front of the vehicle.</p> <p><b>Effects</b></p> <p>There should be a traversable, roof-mounted cupola capable of accepting the C6, C9, or a C16 grenade launcher.</p>	<p><b>Information</b></p> <p>Minimum of a single radio installation with some capable of dual installation. Radios should be easily accessible from inside the crew compartment. Capable of mounting the issued GPS (DAGR).</p> <p><b>Human Dimension</b></p> <p>Vehicle should be capable of seating four personnel, with personal protective equipment (PPE) and personal weapon, with the cab of the vehicle to include a vehicle gunner. Kit storage sufficient for all vehicle equipment, crew personnel equipment to include ruck sacks, weapons equipment and some operation equipment (e.g. NODLR). The vehicle should be equipped with climate control (air conditioning and heat). Blackout light controls.</p>
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The AD&M Tm also developed a list of desirable requirements consisting of the following:

- Fording packages.
- Vehicle should be enabled for limited fording in support of flood response;
- Mounted spare tire. This should be an externally mounted, full-sized replacement tire;
- 110 volt AC circuit. Provision of this capability turns the vehicle into a mobile generator without the need for a power inverter;
- Mount for a snow plough;
- Search light; and
- Run flat tires.

Based on the preliminary research, there is scope to include additional variants beyond the recce variant outlined above. The first is a troop transport and cargo variant. This can be either a hard or soft shell with benches, like many of our existing troop carrying vehicles. The additional cargo space will enable SQMS stores and improved resupply in the absence of MSVS support. A basic ambulance would be much like the cargo variant except with the ability to mount and carry additional stretchers. With this variant there would be no intent for specialized medical equipment although it would likely have a dome light and concealable Red Cross placard. Finally, a command post variant would likely be a hard shell of the same approximate size as the LSVW CP. Potential would exist for additional radio installations.

# OUR ALLIES



ARMOUR BULLETIN



## The Thinning Red Line: The British MOD, Forces Reductions and a New Model Army

Written by  
Maj B. Corbett

As a result of economic austerity measures, the UK Ministry of Defence (MOD) overspending on operations, and the forecast drawdown of the combat mission in Afghanistan in 2014, it was necessary for the British government to rebalance the defence budget and reduce some of the overhead costs of infrastructure and personnel. A Strategic Defence and Security Review (SDSR) was commissioned with the intent of making the military a more “formidable, adaptable and streamlined armed forces.”<sup>1</sup>

The SDSR conducted in 2010 directed that the UK armed forces adopt a more adaptable posture, and manage risks before they materialize in the UK. It identified three strategic priorities:

<b>A</b>	<b>B</b>	<b>C</b>
Contingent capability for deterrence and defence;	Overseas engagement and capacity building; and	UK engagement and homeland resilience.

Further, SDSR also dictated that the strength of the regular army would be reduced from 102,000 to 82,000 by the end of 2015<sup>2</sup>. The Navy, Air Force and MOD civil servants are also facing similar levels of cuts. To realise this level of manpower reductions, the Army will undergo three rounds of redundancies, the first of which was announced in June 2012 which reduced the Army by 2,900 people. Two more tranches of redundancies will take effect in June 2013 and 2014 respectively. Whilst they have endeavoured to find volunteers, over one-third of the personnel made redundant in the first round were not volunteers.

To compensate for the capability gap generated by the loss of manpower in the regular army, SDSR recommended that the reserve force double in size to 30,000 soldiers and have much better integration with the regular force training structure. While the theory behind this initiative is understandable, there is currently no coherent plan, or resources allocated to achieve this. The British army reserve force, unfortunately suffers from the same issues as the Canadian reserves: a very passionate and dedicated group of soldiers but a lack of funding and access to equipment to conduct meaningful training. Further, previous attempts by the Canadian Army to better integrate Reserve and Regular Force units has been met with limited success; recall the 10/90 battalions and other similar experiments. Whether the British Army will be able to achieve the levels of integration they desire has yet to be seen.

As a result of the reductions dictated in SDSR the British Army will undergo a complete transformation into a new structure known as Army 2020. Under the proposed construct, as shown in Figure 1, the field army will consist of two combat Divisions, one Reaction and one Adaptable, as well as Force Troops to provide support. Their primary tasks are as follows:

<b>A</b>	<b>B</b>	<b>C</b>
<i>Reaction Forces.</i> The reaction force division will consist of three Armoured Infantry Brigades and an Air Assault Brigade. These will be the heavy brigades equipped and trained for main contingency operations. For the Royal Armoured Corps (RAC), each brigade will have a tank regiment (Challenger 2) and an Armoured Cavalry Regiment to provide the mounted reconnaissance capability. These regiments will be equipped with the Scout Specialist Vehicle (SV) which is due to replace the CVR(T) – Scimitar fleet in 2020.	<i>Adaptable Forces.</i> The Adaptable Force Division will consist of seven Infantry Brigades supported by three Light Cavalry Regiments from the RAC. The adaptable forces training will focus on Counter Insurgency (COIN) operations. They will be equipped with Jackal and Foxhound type vehicles as shown in Figure 2.	<i>Force Troops.</i> Consists of division level Force Troops which will provide the necessary Combat Support (CS) and Combat Service Support (CSS) to enable both reaction and adaptable force divisions.

The units within each division will be on a rotating three-year Operational Readiness Mechanism (ORM) as follows:

<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
<i>Other tasks:</i> This phase will support force regeneration to include career courses and training support.	<i>Training:</i> During this phase units will conduct road to high readiness training.	<i>Contingency:</i> This is the high readiness cycle where units will conduct theatre mission specific training and deploy on operations.

For the RAC, the reduction in numbers will mean the amalgamation of some regiments and in other cases a complete re-role of capability. With regard to amalgamation: the Queen’s Royal Lancers (QRL) and 9<sup>th</sup>/12<sup>th</sup> Lancers will merge to form the Royal Lancers (RL), in addition, 1<sup>st</sup> and 2<sup>nd</sup> Regiments of

1 Right Honourable Philip Hammond, UK Secretary of Defence quoted in BBC News 5 July 2012

2 This will be the smallest the British Army has been since the 1700’s. Also of note, thirty years ago the British Army was almost twice this size with 163,000 regular soldiers.



the Royal Tank Regiment (RTR) will also merge into a single unit. The RAC will then consist of ten Regiments: three heavy armoured regiments, three armoured cavalry regiments, three light cavalry regiments and the Household Cavalry Mounted Regiment which will conduct ceremonial duties in London.<sup>3</sup> The RAC reserve unit structure will remain unchanged at four reserve regiments: one armoured regiment and three light cavalry regiments.

As a comparison, after some amalgamations, the Infantry Corps will consist of 31 infantry battalions (reduced from 36 battalions) structured into 13 Regiments.<sup>4</sup> The infantry reserve force will remain unchanged at fourteen battalions.

In addition to the reduction in the number of RAC units, the Corps' Directorate has also undergone a significant transformation. Director Royal Armoured Corps has been merged with Director Infantry to form the Capability Directorate Combat (CD Cbt). Unlike the Canadian model where Directors of the Armoured and Infantry Corps are secondary duties designed to provide overall guidance and direction on Corps matters, the British Army model is much more all encompassing. The Director is a Brigadier with a headquarters and staff who are responsible for all training and doctrine development as well as requirements management for equipment procurement. In the Canadian context this is equivalent to taking the infantry and armour staffs from DAD (Directorate of Army Doctrine), DAT (Directorate of Army Training), DLR (Directorate of Land Requirements), DLCD (Directorate of Land Concepts and Designs), career management functions and some bits of the recruiting group and putting them into one organisation. Within the British Army separate directorates are also being created for Combat Support, Combat Service Support and Information.

The end result is that the combined Armour and Infantry directorate, CD Cbt, with almost 150 personnel is structured with four main pillars as shown in Figure 3, each commanded by a Colonel. The rough breakdown of responsibilities is as follows:

A	B	C	D
<p><i>Mounted Close Combat (MCC).</i> Responsible for all aspects of mounted manoeuvre including armoured, mechanised infantry, reconnaissance and CBRN</p>	<p><i>Dismounted Close Combat (DCC).</i> Responsible for all dismounted operations and capability development as well as aspects of command and C4ISTAR</p>	<p><i>Force Development (FD).</i> Responsible for the development of tactical level doctrine, training and experimentation.</p>	<p><i>Organisation and Plans (Org/Plans).</i> Their primary focus is the staff effort surrounding transformation and the process by which the Armour and Infantry units will adopt the Army 2020 force structures.</p>

Also within CD Cbt are the Armoured and Infantry Trials and Development Units (ATDU and ITDU respectively). These units conduct user level testing and trials on any kit and equipment that will be used by RAC or Infantry soldiers.

Despite the challenges of a reduced force structure, there is some good news for the equipment programme. The MOD has allocated approximately £5.5B (\$9B Cdn) over the next 10 years for AFV procurement. The four key programmes that form the "AFV Pipeline" are as follows:

A	B	C	D
<p><i>Scout Specialist Vehicle (SV).</i> As shown in Figure 4, the Scout SV project will procure 540 vehicles to replace the CVR(T) – Scimitar reconnaissance vehicle fleet with fielding scheduled to start in 2020. The vehicle will be fielded to the Armoured Cavalry Regiments within the Reaction Brigades. The platform is based on an ASCOD<sup>5</sup> chassis with a 40mm Cased Telescopic Weapon system and weighs in at approximately 35 tonnes. The Scout SV's reconnaissance capabilities will be unparalleled with excellent mobility, firepower and protection as well as a completely digital electronic architecture that will provide the vehicle with state-of-the-art surveillance and data processing capabilities (including automatic target detection and tracking).</p>	<p><i>Warrior Capability Sustainment Programme (WCSP).</i> This project represents a significant upgrade to the Warrior platform, as shown in Figure 5, and includes automotive upgrades, the installation of electronic vehicle architecture and a new two-man turret with a 40mm Cased Telescopic weapon system. The programme will begin to field vehicles in 2019.</p>	<p><i>Challenger 2 Life Extension Programme (CR2 LEP).</i> This project is still in the requirements definition stage, the intent is to manage the obsolescence issues with Challenger 2 and extend its service life to 2035 – 2040. Starting to field in 2020, the project will include upgrades to the fire control system (including new thermal imaging sights) as well as upgraded suspension and gearbox to deal with the increased weight of the add-on armour.<sup>6</sup></p>	<p><i>Utility Vehicle (UV).</i> Although not yet fully approved within the funding lines, this project is set to deliver an 8-wheeled AFV, similar to LAV III or Boxer, starting in 2022. This platform, as shown in Figure 6, will replace Bulldog (UK version of M113) as well as several Protected Mobility (PM) vehicle fleets such as Mastiff that were purchased as unforecasted operational requirements (UORs) for operations in Iraq and Afghanistan.</p>

<sup>3</sup> Note that within the Household Cavalry Division units will be rotated to conduct ceremonial duties and army force generation tasks.

<sup>4</sup> The most controversial and sensitive amalgamation was the merger of all the Scottish based Regiments into a single Royal Regiment of Scotland formed of five battalions.

<sup>5</sup> The ASCOD chassis is currently in service with the Spanish Army, known as the Pinzaro and with the Austrian Army where it is called the Ulan.

<sup>6</sup> Challenger 2 Theatre Entry Standard (TES) weighs in at just over 76 tonnes.



Although not part of the funded AFV pipeline there is a considerable staff effort to determine which UOR vehicle fleets will be brought back from Afghanistan including the cost and level of effort to make them suitable for use in the UK<sup>7</sup>. Many of these vehicle fleets will be required to fill the capability gap until the vehicle programmes mentioned above begin fielding in 2020.

To say there is a lot of uncertainty in the UK MOD is an understatement. Whilst the soldiers wait to see if they will be made redundant, the Headquarters staffs are trying to plan the transformation roadmap that will allow the Army to adopt the 2020 force structures and at the higher political levels they are fighting the sensitive issues of Regimental amalgamations and infrastructure changes within each Member of Parliament's home riding. Meanwhile the pundits and opposition party debate whether or not an Army of 82,000 soldiers can deliver the UK's strategic priorities. No words sum up the current situation better than Winston Churchill's famous quote following the victory in the Battle of Britain where he said, "This is not the end, it is not even the beginning of the end, but it is perhaps the end of the beginning."

Hopefully the dust will begin to settle in 2015 after the last tranche of redundancies is finalised and the Army 2020 plan becomes clearer. Whilst the road to achieve transformation will not be straight or smooth, there is light at the end of the tunnel; on the whole, the Reaction and Adaptable Division structure represents a good balance of capability with the ability to force generate light, medium and heavy forces across the spectrum of conflict. In addition, the equipment programme is set to deliver cutting edge, battle winning capability. More importantly, you should never bet against the professionalism and dogged determination of the British soldier to achieve the mission.

***Editor's Note: Parallels between what the British Army is going through and our own changes in Canada are noteworthy. Both Armies are attempting to develop sustainable, forward looking structures to meet the unknown challenges of the future. The British, through Army 2020, and Canada, through Force 2013, are experimenting with restructure, reinvestment and re-rolling of capabilities. Most Western militaries are dealing with budgetary and personnel reductions although between the British, Canadians and Americans, the British reductions seem the most substantial. While DND is supporting our Government's Deficit Reduction Action Plan (DRAP), the impact has been largely budgetary with a slight decrease to the civilian DND workforce – very similar to the American experience to date. We, unlike the British, are not facing troop cuts or amalgamation of units and capabilities. Finally, both the British and Canadians are attempting to modernize through the fielding of new equipment while concurrently restructuring and rationalizing. Also of note is a common approach to addressing force generation shortfalls through reliance on Reserves. As noted in this article and through our own experience within the Army and Corps, such strategies are only functional if sufficient integration is achieved. While integration is best enabled at the lowest levels between individual units, it must also be synchronized, resolved and supported at the strategic level.***

<sup>7</sup> As these vehicles were procured under a UOR contract the MOD was able to obtain waivers for many of the health, safety and road worthiness certifications. When these vehicles are returned from operations, a significant amount of testing and modification will need to be carried out to meet these legislative requirements.

Figure 1: British Army 2020 Force Structure

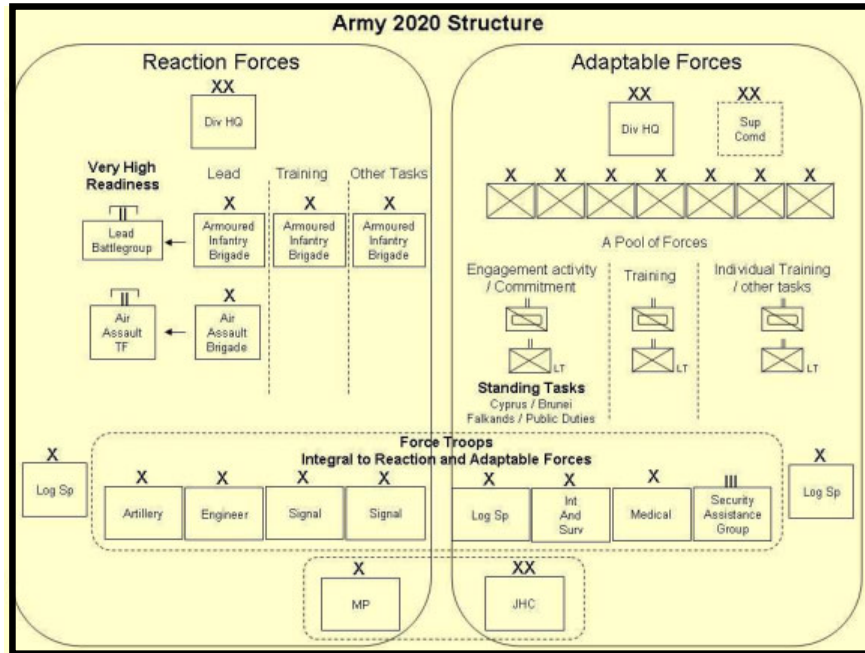
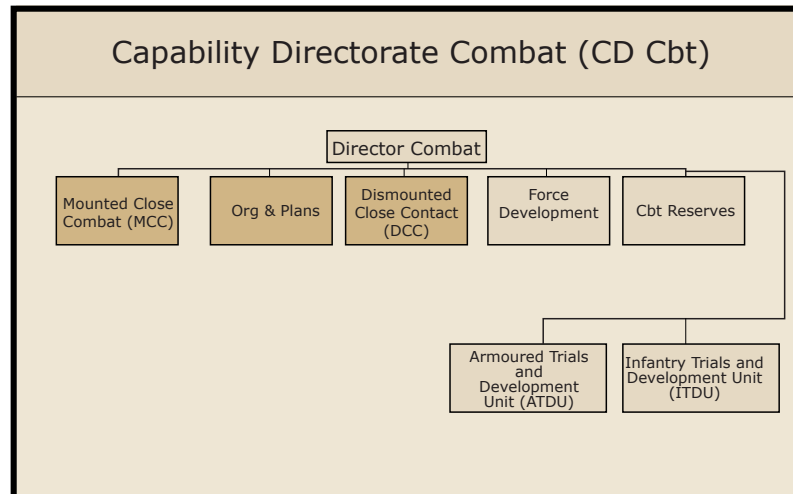


Figure 2: Jackal and Foxhound vehicles which will equip the adaptive force units.



Figure 3: Capability Directorate Combat (CD Cbt) Structure

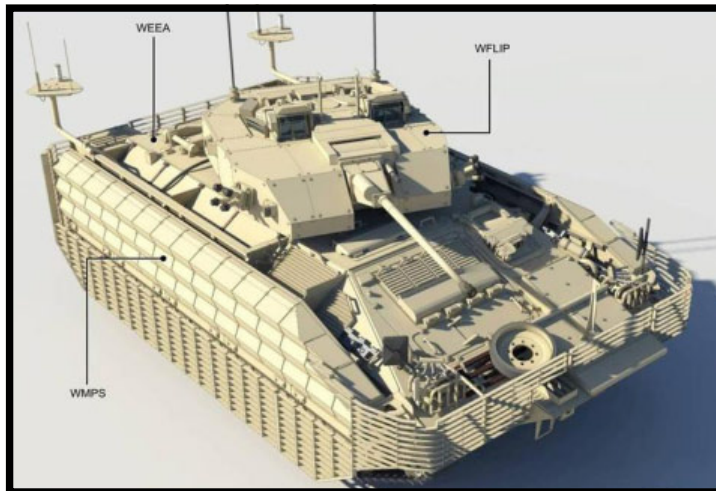




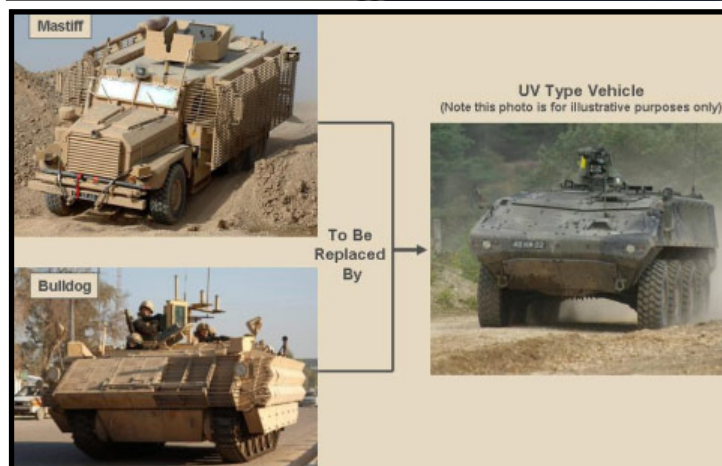
**Figure 4:** Scout SV Reconnaissance Vehicle



**Figure 5:** Warrior Capability Sustainment Programme (WCSP)



**Figure 6:** Type of Vehicle being considered for the UV programme and an example of the UOR vehicle it is intended to replace.



## Small Unit Exchange – Chile

Written by  
Maj D. MacIntyre

LdSH(RC) participated in a Small Unit Exchange (SUA) with the Chilean Army at their Armour Manoeuvre Training Centre called Centro de Entrenamiento de Combate Acorazado Del Ejercito (CECOMBAC) between 21-25 Nov 2011. It encompassed 13 soldiers mixed in rank from Maj to Tpr with the purpose of determining interoperability between tank crews and sharing information on Leopard 2 implementation and desert warfare. CECOMBAC is used to train Armour crews (both Infantry (MARDER) and Armour (Leopard 2)), as well as conduct Army Officer staff courses. The training centre holds all of the simulation for training Armoured crews such as the Leopard Crew Gunnery Trainer (LCGT), the Turret Crew Procedures Trainer (TCPT), and full motion driving simulators. Tactical collective training simulation is conducted using the professional video game series "STEEL BEASTS" which is very similar to the Canadian Armour School VBS simulation system. The training area is approximately 100 km x 300 km in size stretching from the coastal mountain chain to the Andes Mountains.

The Chilean Army has received all of its Leopard 2A4 tanks and constructed facilities for maintenance, training and storing the vehicles. The process started in late 2007 and took 4 years to complete. This implementation process was difficult for them as they had to build the support infrastructure, but they now they have excellent purpose-built facilities for training crews and to conduct maintenance. For gunnery training they only use a mixture of SABOT and HEAT live ammunition to train their crews. Based on their excellent simulation capabilities, including a laser range capability, they qualify new gunners with only 12 rounds of live ammunition. The use of sub-calibre ammunition devices is being phased out by the Chilean Army in favour of a laser training system. The primary reason was that the laser systems are effective beyond the range of the sub calibre device and the laser system works on their range targetry.

The Chilean Army uses a performance-based logistics contract with a company called FMI for all maintenance other than monthly crew maintenance. The company has been contracted to provide 75% reliability/availability of the tank fleet at any time. To this date, the company has been very successful and reliable and has achieved



Courtesy of Maj A.D. MacIntyre

Leo 1 ARV modifications to support Leopard 2



Courtesy of Maj A.D. MacIntyre

Desert Training Area with Andes Mountains.



Leo 1 ARV modifications to support Leopard 2  
Courtesy of Maj A.D. MacIntyre

levels much higher than 75% especially during peak training requirements. This process is similar to what is being investigated for Canada's future vehicle fleets. Instead of purchasing Leopard 2 ARVs they have modified their existing Leopard 1 ARV fleet with modifications to better support the Leopard 2. This includes modifications to the suspension, engine horsepower and crane. It can recover, tow, and pull power packs.

The Chilean Army operates remarkably similar to the Canadian Army. Tactical interoperability can be easily facilitated as the Chilean Army uses NATO map and tactical symbology, employs combined arms fire and manoeuvre and uses a Leopard 2A4 variant that is very similar to the Leopard 2A4 CAN. The Spanish language barrier will pose some challenges, but for a small tactical group exchange of up to a Leopard Troop in size, this could be facilitated with one interpreter/loader in the group commander's vehicle. This would be facilitated by the officers of CECOMBAC as several of them are crew commander qualified and speak English well.

The Chilean Army and specifically CECOMBAC were fantastic hosts. They provided in-depth information on their training systems, equipment and their culture and heritage of the Chilean Army. We, in turn, were able to provide lessons learned in desert warfare of Afghanistan, our echelon system and our gunnery training methodology which was very well received. Interoperability between our Armoured units is achievable and tactical SUEs would be very valuable training opportunities in diverse geographical terrain. These opportunities must be planned for well in advance to ensure that both countries receive the most benefit from the exchange.

**Editor's Note:** This article clearly outlines the benefits of small unit exchanges. This visit provided interesting insight into how the Chilean Army conducts tank training, especially in terms of gunnery. Of particular note is their move towards laser-enabled targetry much like our current efforts with WES Precision Gunnery Systems (WES PGS). Their success has been such that they are moving away from sub-calibre as a gunnery training solution, again of particular note to our current challenges with 120mm sub-calibre training devices (SCTD). Finally, their logistics contract is remarkably similar to the intent for some new capabilities like the Tactical Armoured Patrol Vehicle (TAPV) and the Close Combat Vehicle (CCV). There are many curious to see if our Army will have the same success with this integrated logistics support as the Chileans.



SUE Team in front of Historical Vehicles at CECOMBAC  
Courtesy of Maj A.D. MacIntyre

## GENERAL

### **Forces 2013: A Short History Crewman Career Progression and Course Review Return of Advanced Armour Qualifications?**

**Written by: Maj D.L. Childs**

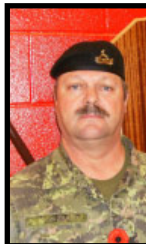
Maj Childs is Officer Commanding Standards Squadron at the Armour School and is the Corps force development lead.



### **Army Driving and Maintenance Team**

**Written by: MWO J.M.E. Robichaud**

MWO Robichaud is currently employed with Standards Squadron of the Armour School as the inaugural Army Driving and Maintenance Team Leader.



### **Training a "Specialists" on the ADFS**

**Written by: WO J.I. McGregor**

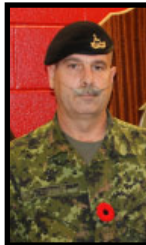
WO McGregor is currently employed as the Regimental Gunnery Warrant Officer at the Armour School.



### **Armour Reconnaissance Squadrons Add Eyes in the Sky with the MUAV**

**Written by: WO D. Cobbett**

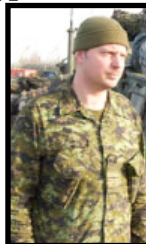
WO Cobbett is currently serving in Standards Sqn at the Armour School. He has been the Armour Corps lead for MUAV implementation since Fall 2011.



### **Combat Team Commander Course (CTCC) – Maximizing Training Opportunities**

**Written by: Major E. Angell**

Maj Angell is Officer Commanding A Squadron, LdSH(RC). He completed CTCC in May 2012.



### **Exercise LION INTREPIDE 2012**

**Written by: Capt C. Chevalier**

Capt Chevalier is currently the Adjt of 12 RBC.



### **Persistent Surveillance System : Lessons Learned from the last operationally deployed PSS Platoon**

**Written by: Captain M. Vergeer**

Capt Vergeer is currently the Operations Officer with the 12e Régiment Blindé du Canada (Militia). He was employed as both the 1 R22R BG ISTAR Comd and PSS Pl Comd in Afghanistan with TF 3-10.



### **Instructor Gunnery Conference – Breaking New Trails**

**Written by: Capt A. Lambert**

Capt Lambert has been the Army Instructor in Gunnery Team Leader since 2011.



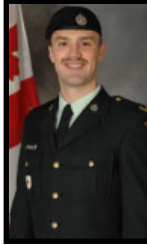


## ARMOUR RESERVES TRAINING

### Decentralized Training for the Primary Reserve

Written by: Capt S. MacKillop and Capt S. Payne

Capt MacKillop and Capt Payne serve with the South Alberta Light Horse as the Operations Officer and Adjutant respectively.



### Decentralized Armour Reserve Training

Written by: Capt D. Gray

Capt Gray is currently the Tactics Troop Leader in Standards Squadron of the Armour School.



### Training Tomorrow's OCs – Reserve Armour Recce Squadron Commander's Courses

Written by: Maj D.A. Hone and Maj T.S. Halfkenny

Maj Dan Hone is currently Officer Commanding of B Squadron at the Armour School and was an instructor on this course.

Maj Tim Halfkenny (RCD) is currently the Deputy Commanding Officer at the Tactics School in Gagetown.



### Tactical Armoured Patrol Vehicle (TAPV) Distribution and the LUVW

Written by: Capt M. Kaye

Capt Kaye is currently the Technical Troop Leader in Standards Squadron of the Armour School. His responsibilities include overseeing the newly formed Army Driving and Maintenance Team.



### RCD support to the Reserve Recce Squadron Commander Course

Written by: Maj R.M.R Morin

Major Ryan Morin is the Officer Commanding D Squadron, the Royal Canadian Dragoons. He and his squadron supported the recent Reserve Recce Squadron Commander Course in Petawawa.

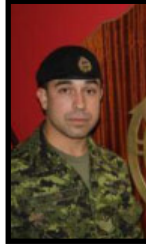


## COMPETITION

### Sullivan Cup: Tank crews going for Gold!

Written by: Sgt F.J. Thibault

Sgt F.J Thibault is formerly of the Army Instructor Gunnery Team. He is currently the Squadron Gunnery Warrant Officer in C Squadron, RCD in Gagetown.



### Inaugural Armour School Recce Skills Competition

Written by: Captains A. Lambert and D. Gray

Capt Lambert and Gray are the Army Instructor in Gunnery Team Leader and Tactics Troop Leader of Standards Squadron of the Armour School.



### The Worthington Challenge

Written by: Capt A. Lambert

Capt Lambert is currently the Army Instructor in Gunnery Team Leader.





## LEOPARD 2

## NEW CAPABILITIES

### The Leopard 2A4 Canadian Introduction Into Service

Written by: Capt K. Rosenkranz-Galindo

Capt Rosenkranz-Galindo is currently the Training Officer at the Armour School.



### Leopard 2A4 Canadian (CAN) Enters Service

Written by: Capt C. Duncan

Capt Duncan was the Leopard 2 Implementation Team Leader



### Leopard 2 Conversion Training - Shape of Things to Come

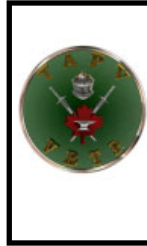
Written by: Captain D. Gray and Captain M. Kaye

Capt Dan Gray and Mike Kaye are employed in Standards Squadron of the Armour School as the Tactics and Technical Troop Leaders.



### Tactical Armoured Patrol Vehicle (TAPV)

Written by: Project Management Office TAPV



### Familiar Platform; New Capabilities and Challenges

Written by: Sgts L. Chevalier-Boisvert and C. Keith

Sgts Chevalier-Boisvert and Keith are both members of the Army Instructor in Gunnery Team.



### LAV RECCE

Written by: Capt D. Saucier

Capt Dan Saucier is currently serving in the Directorate of Land Requirements (DLR) on the LRSS UP Project.



### LUVW Replacement Requirements

Written by: Army Driving and Maintenance Team



### LUVW Replacement – A Major Issue for the Reserves

Written by: LCol P. Halton

LCol Halton is the Commanding Officer of the Queen's York Rangers 1st American Regiment in Toronto.





## OUR ALLIES

### **The Thinning Red Line: The British MOD, Force Reductions and a New Model Army**

**Written by: Maj B. Corbett**

Major Corbett, a former editor of the Armour Bulletin, is currently serving in England with the Armoured Trails and Development Unit at the Armour Centre in Bovington.



### **SMALL UNIT EXCHANGE – CHILE**

**Written by: Maj D. MacIntyre**

Maj MacIntyre is currently the Officer Commanding of Headquarters Squadron of the Lord Strathcona's Horse (Royal Canadians)



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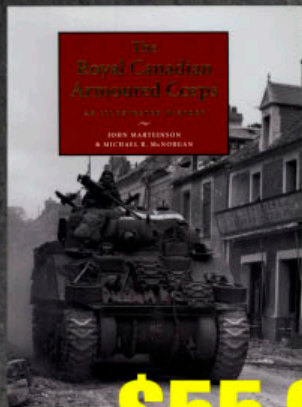
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