VISION STATEMENT

The Armour Bulletin is the official journal of the Royal Canadian Armoured Corps. The Mission of the Armour Bulletin is to annually publish unclassified, bilingual articles of professional interest, with a view to stimulate discussion and exchange ideas concerning topics germane to the Canadian Army and RCAC.

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FOREWORDS

EVENTS AS SEEN FROM THE COLONEL COMMANDANT'S TURRET

I am thrilled to provide the foreword in this 2015 Armour Bulletin. This year's production has provided ample opportunity to discover many areas that influence our Corps now and in the future. Well-researched articles, ranging from crew TTPs to our contribution in advancing the Army's Force Employment Concept 2021, will provide the reader abundant food for thought. Moreover, the editing team has not neglected to add the always tantalizing equipment updates, and stimulating concept papers.

As few have had the privilege of producing the Bulletin, the challenges which it entails are often overlooked by the readership. I recall, while serving as School Commandant, the struggle my successive managing editors experienced in their quest to gather timely, accurate and informative thought provoking articles from the Corps' membership. The Bulletin's perennial success status is predicated on achieving a balance between two objectives: acquiring quality articles and the curiosity of its audience. The former has clearly been achieved and I anticipate that the latter will be fulfilled in due course.

One of the aspects that is not well understood and is often overlooked is the follow-on debate. It is my experience that black hats are not normally passive in expressing opinions as idea divergence is a natural trait. Thoughts and opinions are not carved in stone and unless they are challenged they will remain stagnant. I encourage you all to formalize the discussion by providing your thoughts and comments directly to the managing editor. He will ensure wider dissemination of your views via our Corps/School web site: www.armourschool.ca . I congratulate the School Commandant and his team as their effort has achieved the mark. Now it is up to you to contribute!

I am looking forward to reading your follow-on accolades, rebuttals, comments and/or suggestions. Finally, I encourage you all and particularly the senior leadership of our Corps to sponsor and/or produce an article in the 2016 Edition and/or future Armour Bulletins.

Good Reading!
Worthy

Georges
Colonel (ret) G. Rousseau
Colonel Commandant
Royal Canadian Armoured Corps

DIRECTOR RCAC INTRODUCTION

Innovation and agility continues to be a fundamental dimension to RCAC culture. It is inspired by the tenacity of our soldiers and the will to win in every fight. In practice it is about reflecting on lessons, rethinking convention and simply trying new approaches. Your Armour Bulletin continues to thrive as venue for much of that examination and professional reflection. As the Corps contributes to Directorate Army Doctrine effort to renew Armour doctrine, the body of work included within this bulletin serves to enrich those deliberations.

Change and innovation was a strong theme in last few editions of the Armour Bulletin. Change remains a dominant feature of both the security environment within which the Corps will operate and therefore innovation remains a valued commodity. As readers will quickly learn, this edition is another great collection of articles and thought pieces to that end.

The Corps is strong. As I have said before, the Armour Bulletin offers one of the few opportunities to affirm who we are as a Corps. Knowing who we are and what we contribute, amongst other things, fosters innovation and reflection. We are a multi-platform Corps grounded in expertise in command, armoured warfare and land manoeuvre. Our core capability is not the equipment we master, but the soldiers that enable them. Our responsibility is to continue to perfect our craft, as well as champion and educate in all venues, our unique contribution to the all-arms team. Our expertise is not only the sum of our competencies in reconnaissance and the armoured warfare. It is also the contribution of our command culture that inculcates rapid, aggressive, adaptive and agile thinking at all levels of command. Indeed, a source of pride for all of us.

Worthy,

S.R. Kelsey
Col
Director

ARMOUR BULLETIN EDITOR-IN-CHIEF – FORWARD

It is certainly a great pleasure to provide the readership with this most recent edition of the Armour Bulletin. This edition will no doubt provide some broad situational awareness and insight for all as to the many different areas where the Corps is actively engaged.

Change is ubiquitous in the current environment as all will appreciate, but the Corps is on very good footing going forward thanks to the hard work, dedication and professionalism of Corps soldiers, NCOs and Officers. The Corps faces important challenges in the near to mid-term: the stewardship of aging equipment, the introduction of major capabilities, the continued force generation of capabilities for deployment both domestically and internationally, the continued modernization of individual and collective training and most importantly, the continued care of careful management of our most precious resource – our soldiers.

As present the most pressing issue for the RCAC is to find a way to sensibly and logically divest the Corps' aging Coyote LAV II fleet and implement the Canadian Army's newest capability, the Tactical Armoured Patrol Vehicle (TAPV); which will service, although not fully, both Regular Force and Primary Reserve reconnaissance requirements going forward. This analysis is being scoped in earnest with multiple stakeholders, with a view to ensuring the plan is deliberate and logical – without compromising the Corps ongoing force generation and potential force employment outputs. The Corps' commitments to the Canadian Army endure, and we will continue to meet the Army Commander's commitment of developing a combat effective, multi-purpose land force to meet Canada's defence objectives going forward.

It is with great pleasure that I bring the readership the most recent edition of the Armoured Bulletin. My thanks to all those who contributed to this year's edition and the ongoing professional dialogue within the Corps. In particular, I would like to thank the Managing Editor, Major Ted Dossev and the Editors, Captain Mike Bastien and 2lt Connel for all of the hard work which produced this excellent publication.

After reviewing a number of previous editions, I was struck by how often the words 'change', 'transformation' and 'challenge' served as the themes in the forewords of the Armour Bulletin. Those terms have dominated the strategic landscape since long before most of us joined the Corps and will continue to do so long after we have left. It seems that we have always been on the edge of crisis. However, it has to be recognized that walking hand in hand with those challenges are opportunities.

The Canadian Army is currently re-examining its force generation and force employment models, reinvigorating and modernizing our capacity as an Army to conduct combined arms manoeuvre up to the formation level. This process is already having an impact on our capability development, our training and ultimately, it will change the way we fight. In some ways, what was old is new again. This presents an opportunity for the Corps. An opportunity to consolidate on the successes of our operational experience as well as an opportunity to regain some of our lost manoeuvre space.

We need to align ourselves with the evolving strategic concept and communicate our ongoing relevance to the Army. As masters of land manoeuvre and mounted warfare, the Corps is ideally suited to conduct and lead adaptive, dispersed operations. Simply put, it's an easy fit for the way we operate and the way we think. However, that alignment is going to take some work. We need to re-educate ourselves on what the role, fundamentals and characteristics of armour truly are and then embark on re-educating the wider Army.

Recently, a writing board was convened in Gagetown with the aim of internally aligning and renewing our doctrine. The board was seeking to create a common intellectual foundation for all armoured forces, bridging the gap between reconnaissance and tank operations. A gap that we, the Corps and the Army, had allowed to widen over the last number of years. The resulting doctrine note is being refined and will soon be circulated around the Corps for commentary before being pushed higher for approval. Once we have that approval, we will have the framework to influence the future of capability development, force structure, force generation and force employment within the Army.

Within this edition are a number of articles that discuss these ongoing debates. This internal discourse is essential as we move forward towards the Army of Tomorrow. We need to define who and what we are as a Corps before we can influence any of these. However, if the debate continues without resolution, we risk losing the opportunities that the Corps is currently facing. A fundamental of armour has always been aggressiveness. The Corps needs to act with speed, resolution and boldness.

Worthy

C.G. Hutt
LCol
Editor-in-Chief

CORPS SERGEANT MAJOR'S CORNER

Once again, it is a pleasure to address you all in this year's rendition of the Armour Bulletin. This edition of the Armour Bulletin will address the broader based issues of fielding the new equipment coming into the Corps, along with many subjects pertaining on our business in general. It has become quite evident that business within our great Corps has continued to change over the past year. In particular; increased efficiency with the Leopard 2, and preparations for the introduction of the TAPV into our midst. The Corps has trained on many vehicles over the past decades, so for most "situation normal". As I have stated many times to a number of soldiers and officers within the Corps, these are exciting times and we need to embrace and move forward with such changes. When I see the many issues and or problems that we face each and every day, I do not see them as issues and or problems, but one of a many list of challenges that we as a Corps must and will sort out.

Some of the many changes over the past year have had nothing to do with vehicle introduction, but everything to do with the Corps itself. As all are aware, 2015 was our Corps 75th year. Throughout the year here were many several tributes and celebrations that were held – "all in true Armour Corps fashion". I want to everyone within the Corps for all their efforts for such a great year overall. Finally, we said goodbye to the Colonel Commandant, BGen Dean ret'd and welcomed our new Colonel Commandant, Colonel Rousseau ret'd. Again, it was a great year within the Corps!

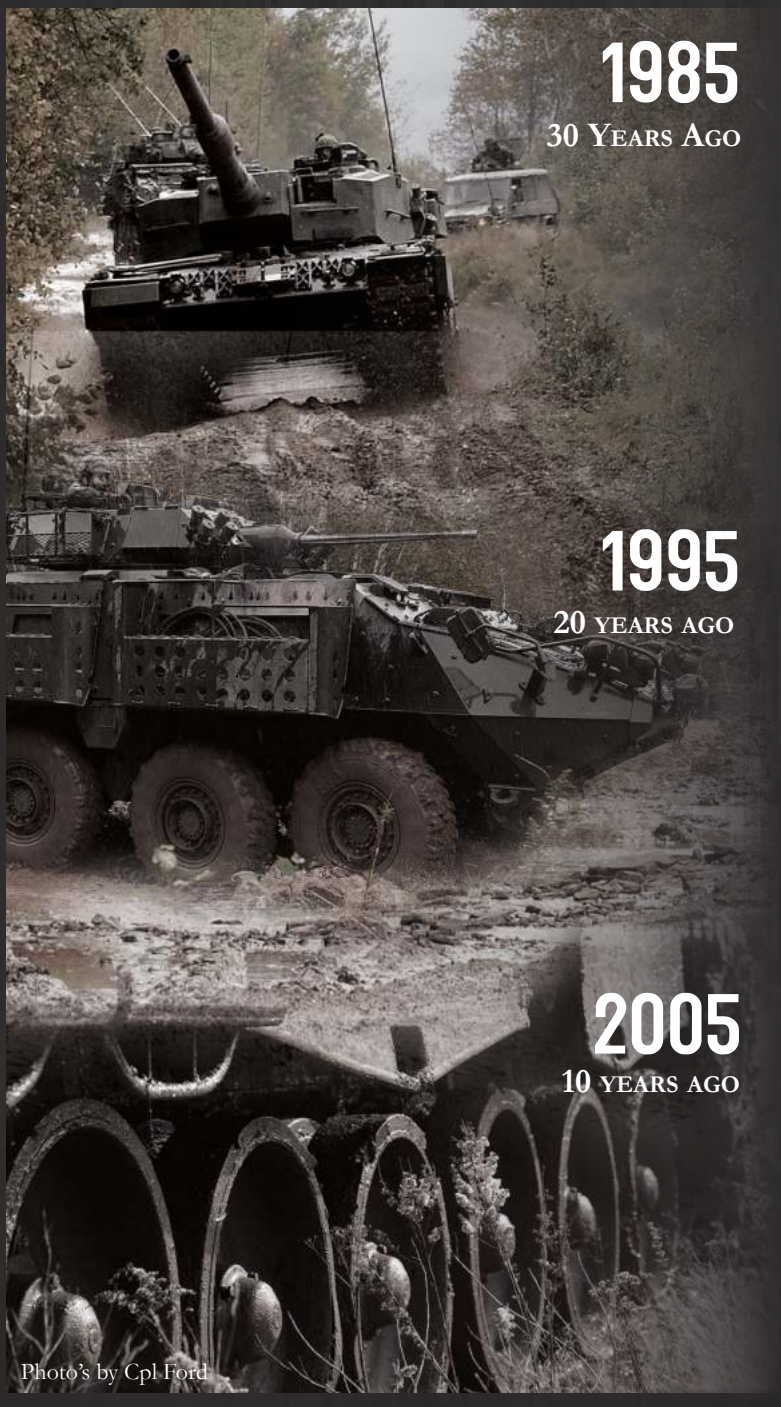
An overall tremendous year for promotions also was had. We continue to face a rate of promotions which has not been seen in some time. Whilst being a great thing, our school now has to keep pace with the number of promotions that we have had the pleasure of. The so what to this is quite simply that, we need to continue as a Corps to push our best to the school in order to continue production of the finest soldiers and officers within the CAF, pointe finale!

In summation, I encourage all to continue to remain focused on the many tasks at hand, as we (the Corps) are the ones who will benefit from our tireless efforts in the end. I commend you all on your efforts as we traverse our guns through these very challenging but rewarding times.

Best to all

Chief Warrant Officer W.A. Laughlin, MMM, CD

FLASHBACK



Photo's by Cpl Ford

1985
30 Years Ago

In 1985, CWO K.K. Maybee discussed origins of where the actual name "tanks" came from. He identified that the actual name of "tank" had never been clearly established. He offered three versions of where the name had originated. Number one related to the invention of Thomas Tank Burall and his ten horsepower traction engine with a Landore steel boiler. Number two led to dispatch riders who were selected to be drivers for the new British war machines. They likened the resemblance of theses beasts to the gasoline tanks on their motorcycles. Lastly, the third and more generally approved version was the story of the secrecy surrounding the fabrication of these large "tank-like" bodies.

1995
20 years ago

In 1995, an article was published by LCol S. Holder on the naming of the LAV Recce. The article mentioned the guidelines in naming a vehicle which stipulated that proposals were to be bilingual names of mammals indigenous to Canada. At that time, with some vehicles destined for the Infantry Corps, both Director of Armour and Infantry would approve recommendations prior to submission to National Defence Headquarters. The names ranged from ANTELOPE to WOLVERINE and included novel monikers, such as ARMADILLO. The original list was narrowed down to six: COYOTE, CARIBOU, PUMA, SASQUATCH, OCELOT and RAT.

2005
10 years ago

In 2005, then Capt Dale Childs published an article on the "Dismounted Requirements of Mounted Reconaissance." He mentioned that despite mounted reconnaissance being our expertise, crewmen often find themselves having to dismount for a variety of tasks. Throughout the article he identified how little training crewmen receive with regards to dismounted patrolling and that "learning by osmosis" is a sad reality. Quality of instruction and skilled mentors can be questionable and are a problem that has not gone away. Editor's note: This lack of formal training is an issue that we continue to struggle with today even as we welcome new capabilities and are bound by training days and resources.

YEAR IN REVIEW

Photo by Cpl Ford

RCAC 75TH ANNIVERSARY - THE YEAR IN REVIEW

BERNARD J.A. CIARRONI

This year our Corps celebrated its platinum anniversary. Dinners, parades, and presentations were conducted across the country culminating in October with the change of Colonels Commandant in Gagetown and a gala all ranks dinner hosted by the Armoured School and the RCAC Association. Of particular focus during this celebration of our seventy five years as a Corps was a serious look at our historical artifacts, their restoration and in some cases rescue so that they can be digitized and preserved for the future.

The annual Black Hat dinner was held in February at the Army Officer's Mess in Ottawa. A portrait of MGen Worthington was presented to the Mess to hang in the Stables. BGen Dean graciously donated a painting done by Worthy to the mess as well and they now both hang in a prominent place. The next major event was the Army Ball in April; four shoulder sashes were presented to the Corps by Lieutenant Governors of Ontario and Quebec, the Commander of the Canadian Army and the Army RSM. These sashes are emblazoned with the one hundred and ten Battle Honours the Corps has earned since its inception on August 13th 1940 and will be held at the Armoured School. The month of April sadly marked the loss of BGen Radley-Walters at age 95. A legend in the Corps and the Canadian Army, he left us an amazing legacy. He was the model armoured officer in battle and after having gone through the mud and the blood of the battlefield he is finally in those green fields beyond.

In June representatives from across the country gathered in Camp Borden. The Commanding Officer of the Ontario Regiment, LCol Mike Rostek, coordinated the armoured regiments of Ontario in providing tremendous support and an outstanding parade as plaques were presented to be placed on the cairns beside MGen. Worthington's grave. BGen Dean our Colonel Commandant gave a wonderful speech that spoke of Worthy's resolve in establishing the Corps and of the Armoured Corps exploits since that time. Then with a few words from the Association president

the padre blessed the site and the event ended with a reception held by the RCAC Association.

The celebrations ended with the Worthington Challenge in late September early October in Gagetown. The annual Armoured Board and AGM were held and this also marked the change of Colonels Commandant as BGen Dean handed over to Col Georges Rousseau at a true Armored Corps parade and roll past. Finally the evening was capped by an all ranks dinner dance with over five hundred folks in attendance.

During the year artifacts were also attended to via the restoration of paintings, armoured Corps displays and the rescue of historical treasures from hangars in Camp Borden. The RCAC Association supported by the Armoured Branch Trust Fund invested over thirty thousand dollars in all the efforts and events at this significant time in our history. A number of units also contributed financially to making the 75th anniversary a success and I would like to thank the Royal Canadian Dragoons, Lord Strathcona's Horse, the 12e Regiment Blinde du Canada, 12e Regiment Blinde du Canada (Milice), The South Alberta Light Horse, The Royal Canadian Hussars, The Ontario Regiment, and the British Columbia Regiment. We also received funding from GDLS and a major donation from Nammo Canada.

Camp Borden Armoured Corps Commemorative Parade June 2015

EXERCISE WORTHINGTON CHALLENGE 2015

CAPT T.L. COLLINGS

This year, Exercise WORTHINGTON CHALLENGE executed the important role of gauging the state of mounted warfare in the Canadian Army, as well as providing a venue for the recently formed army divisions to come together in direct competition. The Royal Canadian Armour Corps School (RCACS) led the planning and execution of this traditionally RCAC focused event. However, this year the Combat Training Centre (CTC) provided oversight and all front line units were represented. This additional oversight helped provide the Army Commander with a clear picture of mounted warfare skills across the Army. The accurate measurement of mounted warfare skills was attained through a diverse set of stands which included an Armour Fighting Vehicle (AFV) range worth thirty percent, as well as a Driving and Maintenance (D&M) challenge, a March and Shoot stand, and a Night Navigation stand each worth twenty percent. All stands (less the AFV range) incorporated other challenges, as well as an evaluated fitness component worth ten percent of the overall score. This diverse range of skill sets ensured a challenging and demanding competition for our mounted warriors.

The team composition this year was a change from years past, reflecting the Army wide nature of this competition. There were teams from the 2nd, 3rd, 4th, and 5th Canadian Divisions (5th Canadian Division incorporating the Canadian Army Doctrine and Training Centre team), and the Royal Danish Army. Each team consisted of crews from the various units within their respective formations to include the Infantry Battalions, Armour Regiments, the Royal Canadian Artillery, the Royal Canadian Engineers, as well as a Primary Reserve component for the first time. Each team was made up of a tank fire team, three 25mm crews, and two LUVW crews from the Primary Reserve. The Royal Danish Army provided a tank fire team that would compete for the applicable title. The trophies available for victorious teams were the Top Division Team, the Top Tank Fire Team, the Top 25mm Crew and the Top LUVW Patrol. In order to achieve success, teams had to compete in each competition as well as the applicable fitness

Overall Champions 3rd Cdn Div

component. The team with the highest overall score would win their applicable category, while the division with the highest overall average would take home the top trophy for the competition.

The AFV Range this year was conducted by the Army Instructor Gunnery cell resident in the RCACS Standards Squadron and took place at Firing Point 4 and 5. In past years, the range was designed to incorporate static shoots as well as battle runs, testing crew skills on static targets and movers, with both main gun and coax. For the LUVW patrols all shoots were done static from the cupola with a C6, but movement was incorporated into the range itself, with shoots occurring at various distances. At the end of the day, mounted warfare remained the focus of the competition with gunnery being a vital component of that. This stand was the most heavily weighted and had no sub-components or fitness portions. All scores attained on the range came from the application of fire by vehicle crews alone.

As a mounted warfare challenge, driving and maintenance had to be taken into account. To test this vital skill, A Squadron, RCACS, ran a Driving and Maintenance stand at the Gagetown driving circuit. This stand tested the crew's ability to speedily and safely traverse an obstacle laden driving circuit, as well as their skills in driver maintenance and basic first aid. At this stand crews arrived, conducted either a road wheel or wheel change for time and completed a driving challenge for time while avoiding various obstacles and finally reacting to a casualty scenario. Scores were granted for time with penalties being accrued for various mistakes. Some of the mistakes observed were safety violations and striking an obstacle. Fitness was also tested with the time between each sub-stand being calculated toward the teams' overall fitness scores.


Photo by Cpl Ford

Lav III on Driving Circuit

Top LUVW Patrol 5th Cdn Div

B Squadron, RCACS conducted the Night Navigation stand this year, which had a decidedly reconnaissance flavour. The stand had an entirely dismounted focus with soldiers competing in what was essentially a dismounted recce patrol at night, involving several navigational challenges, as well as some randomly generated additional challenges located at various stages of the navigational course. This stand proved to be long and grueling for competitors because they not only had to navigate by night, but also had to complete an Armoured Fighting Vehicle (AFV) recognition test. In addition, range estimation and complete indirect calls for fire were required tasks for this stand. Fitness was evaluated on this stand through the calculation of average speed during the night navigation. The benefit to competitors for this stand was the granting of a day of rest following its completion.

The Infantry School was a sizable contributor to Ex WORTHINGTON CHALLENGE 2015, as they planned and executed the March and Shoot stand. This stand began with competitors completing the obstacle course which was followed by a C6 assembly and functionality test. Once complete, the competitors immediately completed a forced march in Full Fighting Order (FFO) to the Amiens and Reichwald Ranges. Once in location, competitors began a challenging set of shoots using the C7A2 service rifle and 9mm Browning Hi-Power pistol. Incorporated into the range was a simulated withdrawal under fire, as well as a casualty evacuation. In true Infantry fashion, fitness was a huge component of this stand and was calculated by the overall time attained during the completion of the obstacle course and forced march.

The results of this year's challenge truly demonstrated the importance of the various mounted and dismounted skills a soldier must maintain to be an effective mounted warrior. No one team dominated at any single skill. Rather, it was clear that success across a variety of skills was required to achieve overall victory. When it came to placement, the Army of the West notably pulled ahead of the others in fitness and small arms marksmanship. This score helped the 3rd Canadian Division achieve the highest score overall and win the top division


Photo by Cpl Ford

Competitor at the Small Arms Range, as part of the March and Shoot

Top Tank Fire team LdSH(RC)

trophy. The 5th Canadian Division/Canadian Army Doctrine and Training Centre achieved the highest scores for tank gunnery, which helped propel them into 2nd place overall. The 4th Canadian Division's generally even scores across all skills allowed them to attain the 3rd place slot. Regarding specific platform trophies, the Lord Strathcona's Horse (Royal Canadians) took home the top tank fire team, which also helped them win the overall highest Division score. They were followed closely by the Royal Danish Army who were but a few points from the top tank fire team position. The top 25mm crew went to the 4th Canadian Division, with the Royal Canadian Dragoon crew clearly dominating that category, scoring well ahead of all other 25mm crews. The final trophy went to the 5th Canadian Division for the top LUVW patrol, which was attained by a composite team composed of soldiers from the Prince Edward Island Regiment, the Halifax Rifles, and the 8th Canadian Hussars (Princess Louise's Own).

In the end the competition proved to be an excellent evaluation of the state of the Army's mounted warfare skills, as well as an insight into our mounted warriors dismounted skills. Overall the competition demonstrated the state of gunnery in the Army and provided insight into soldier skills across all the combat arms trades and across all the Army's divisions. As well, the competition provided the Armour units across Canada a chance to come together with soldiers from other units in the spirit of competition. This competition continues to provide soldiers and commanders the chance to showcase their unit's and formation's skill levels, while promoting fitness and soldier skills as well as furthering esprit de corps.

Leo 2 prepares to engage targets at the AFV Range.

Top 25mm Crew from the RCD, representing 4th Cdn Div

RCD - A YEAR IN REVIEW

BY LT C.M. SMITH AND LT N.P. HOMERSKI
(BOTH LT SMITH AND LT HOMERSKI ARE TP LDRS WITH D AND C SQN RESPECTIVELY)

2015 has been a year of change for The Royal Canadian Dragoons in Petawawa, as the Regiment continued its transition to full-fledged Cavalry operations.

Starting with the lessons learned during Ex GHOST SPRINGBOK 2, as presented in the 2014 Armour Bulletin article "Revisiting the Concept of Cavalry" the Regiment spent this past training year focussed on gaining the skills and experience required to become an effective medium weight Cavalry Regiment.

The Regiment began this transition into Cavalry during the 2015 PCF cycle focussed on building crew and troop skills with several gunnery and driver based courses. The PCF cycle culminated with Ex FIGHTING DRAGOON, which allowed Sqns to explore Cavalry operations in both the mounted and dismounted roles. The exercise involved traditional reconnaissance tasks in terms of defining enemy positions and ended with Sqns conducting combined live fire section and platoon attacks. This exercise provided an important building block as it allowed commanders at all levels to gain a greater appreciation of the core skills required to conduct the wide range of Cavalry spectrum operations.

Although there were several regular training events after Ex FIGHTING DRAGOON, to include the 2015 CAVALRY CUP, the next major exercise for The Regiment was Ex STALWART GUARDIAN (SG 15) held in late August. Ex SG 15 was focussed on building the skills of Ontario's Primary Reserve Regiments. The RCD was initially tasked with mentoring the participating

D Sqn Conducting a stab run during Ex FIGHTING DRAGOON.

Intimate Support tank with B Coy LAVs roll onto the objective.

Armour Reserve units before becoming the Primary Training Audience's (PTA) enemy force. After a week of classes and mentorship, The Regiment provided a robust OPFOR with augmentation from 1 RCR and 2 CER. Although the Regiment was not the training focus, the exercise allowed Sqns to build upon the lessons learned during Ex FIGHTING DRAGOON and was the first opportunity to conduct Cavalry operations in a combined arms environment.

As the fall training schedule concludes, two major training exercises have been conducted including Ex WALKING DRAGOON (Ex WD) in Meaford and Ex CHARGING DRAGOON (Ex CD) in Petawawa. These exercises which took place both on and off base included live fire elements as well as close integration with infantry and supporting arms elements. Both Ex WD and EX CD were aimed at not only building on the tactical lessons gained since the Cavalry transition began but also solidify, integrate and create SOPs at all echelon levels. These exercises will set the stage for the Regiment to participate in Ex MAPLE RESOLVE 2016.

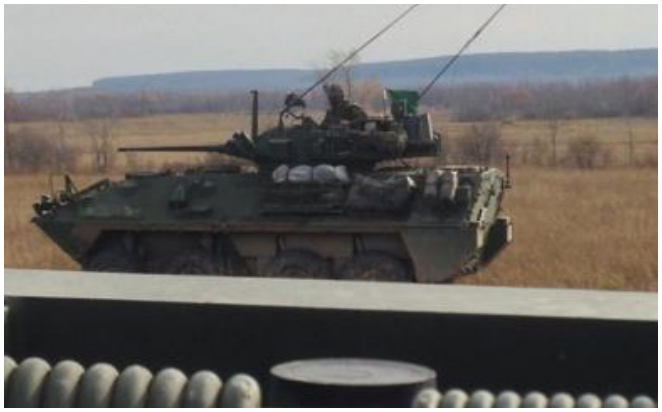
Although The Regiment in Petawawa continues its transition into Cavalry, C Sqn in Gagetown has focused on working in a combined arms battlefield. With its High Readiness cycle coming to an end, C Sqn maintained its high tempo of training throughout the year. All preparatory training and ranges culminated in the deployment to support Ex COMMON GROUND II 2015, held at 5 CDSB Gagetown in November. The Squadron formed a square Combat Team with B Company, le Royal 22e Régiment. Working in this Combined Arms environment


By Cpl M.Worth.

Assault tanks roll over the objective with CH 146 Griffons in over watch.

provided an excellent opportunity to share knowledge between trades and develop Standard Operating Procedures in order to be able to function as an effective manoeuvre element. It reinforced the necessity to effect communication and demonstrated the complexity of manoeuvre warfare down to the sub-subunit level. From practicing basic soldier skills to developing an understanding of the Combat Team Commander's planning considerations, the exercise was confirmation that C Squadron had maintained its extremely high level of professionalism and effectiveness in the battle space.

A Sqn prepping for battle in the FOB during Ex WALKING DRAGOON.



B Sqn leading a hasty attack during Ex WALKING DRAGOON

LDSH(RC) - A YEAR IN REVIEW

CAPTAIN M.A. HOFFART,
ASSISTANT ADJUTANT LDSH(RC)

Over the past year, the training calendar for Lord Strathcona's Horse (Royal Canadians) been full with the entire Regiment deployed on Exercise MAPLE RESOLVE (MR) 15 followed by summer PCF and IBTS training, the Regimental fall field exercise, Exercise STEELE SABRE, and preparations for Exercise MAPLE RESOLVE 16. Concurrent to all of this training, the Strathcona's fielded competitive teams for the Canadian Patrolling Concentration (CPC) and the Worthington Cup.

OPFOR Battle Group ready for war during Exercise MAPLE RESOLVE 15

In January and February of this past year Regimental Headquarters, A, B, and Recce Squadron all rotated to Fort Hood, Texas on Exercise STEELE BEASTS (SB) to conduct joint combat team training on state of the art simulators with soldiers from the 1st US Cavalry Division. Immediately after Ex SB ended, the Regiment reconstituted and deployed to Wainwright for Exercise MR 15. B Squadron was attached to 5 Canadian Mechanized Brigade Group as the high readiness tank squadron while the remainder of the Regiment formed the OPFOR Battle Group. With an attached infantry company (from 1 PPCLI), artillery battery (from 1 RCHA), troop of engineers (from 1 CER), and helicopters (from 408 THS) as well as additional specialists, LdSH(RC) gained valuable experience leading a Battle Group on exercise. This knowledge will be vital over the upcoming year as the Strathcona's will be forming a Battle Group as part of TF 1-16, a first for the Armoured Corps in the past 10 years and a first for the Strathcona's since 1997.

After a busy PCF and IBTS training cycle this past summer, each of the Squadrons deployed back to the field starting in September. A Squadron shipped their tanks to Shilo in order to join the 2 PPCLI Battle Group on Exercise KAPYONG MACE as part of the road to high readiness. Concurrently, the rest of the Regiment deployed to the Wainwright Training Area honing skills from the crew to the Squadron level with each sub-unit concluding the exercise with Level 5 training in a Level 6 Battle Group context, augmented by two Companies from 1 PPCLI. The Level 5 training confirmed B Squadron's preparedness as the high readiness tank Squadron. Following the fall field training exercise the Command Teams from the Regiment began preparations for Ex MR 16 with Exercise UNIFIED RESOLVE (UR) Part 1. The goal of Ex UR was to exercise the Battle Group Headquarters in a Level 7 context. Shortly after Ex UR ended, A Squadron deployed a Troop to Centro de entrenamiento de combate acorazado (CECOMBAC), in Iquique, Chile on a Reciprocal Unit Exchange. It proved to be another excellent opportunity to train with and learn from allied military forces.

A Leo 2A4 stands ready for battle.

Throughout the year, the Regiment also trained competitive teams for the annual Worthington Challenge and the CPC. The team that was selected for the Worthington Challenge conducted intense physical and mental individual and team training which was reflected in the final scores at the competition. The LdSH(RC) tank crews earned the top score amongst the 120mm teams and, lead by the Strathcona's, the 3rd Canadian Division team placed first overall. Within the Regiment there was also a selection process and training program for the team that would compete at the annual CPC. After months of training and preparations the team deployed to Wainwright in November for the competition, finishing in the top 50% out of 30 teams.

The individual and collective accomplishments of the Strathcona's as well as our and lessons learned will help pave the way for success as the Regiment continues down the road to high readiness. Perseverance.


By Captain Dave Williams

An A Squadron Leo C2 is offloaded from a rail car in preparation of Ex KAPYONG MACE in Shilo, Manitoba.


By Corporal Dave Olaes

The Strathcona Ceremonial Mounted Troop (SMT) provides an impressive display of horsemanship to an eager crowd at Spruce Meadows. A living display of Strathcona history and traditions, the CMT has a full schedule to meet the demand for their performances across Western Canada.

'The 120mm team from the Strathcona's pose with their hard earned first place trophy.


By Corporal Dave Olaes

A tank fires another smoke round during a day time troop shoot. They troop practiced building a smoke screen.

12e RBC – A YEAR IN REVIEW

NEWS FROM 12e RBC VALCARTIER

The Regiment in Valcartier had an exceptionally busy fall and winter. Our members partook in eight major exercises and supported the Combat Team Commander course in Gagetown. Beginning with Ex SABRE AUCLAIR 2015, all sub-units deployed in the field for three weeks of training. B and D Squadrons were the Primary Training Audience, A Squadron filled the billet as Enemy Force, and HQ Squadron provided support throughout the exercise. They trained for different armoured recce tasks and this exercise was the validation of D squadron, who is currently the 5th Mechanized Brigade Group's recce squadron.

In November, D Squadron left for Gagetown and was employed as brigade recce squadron for Ex COMMON GROUND II which supported the Combat Team Commander's course. Members of C Squadron (the tank squadron in Gagetown) were also employed and trained as the sabre squadron on the Leopard 2 platform for the Battle group. It was a great combined arms experience for our younger soldiers.

The Regiment participated in Remembrance Day parades in different locations around the province of Quebec. The Regiment held the annual Christmas social activities, the Troops' Christmas dinner, the NCO/Officers' hockey game, CO's Christmas dinner and also saw regimental participation in charity activities around Quebec City.

In January 2016, B Squadron formed a Combat Team with infantry, combat engineers, and artillery elements and deployed to Fort Irwin, California for 4 weeks. There, they conducted a major exercise with the 2-2 (US) Stryker Brigade Combat Team. They were employed as a Cavalry Squadron which is 4 troops of 4 vehicles instead of recce which usually consists of 3 troops of 8 vehicles. With support of infantry, engineers and US artillery, they cleared small towns and participated in traditional fire base tasks. The scale of US training capacities in Fort Irwin proved to be another great experience for B Squadron and the complicated shipping and border regulations provided a specific challenge for our Regimental HQ 2IC! Each vehicle spent 36 hours in a cleaning process to be allowed back into Canada.

During the month of February, the Regiment formed a Battle group and deployed to the Bécancour/Nicolet area for Ex RAFALE BLANCHE 2016. Composed of 2 recce squadrons, 1 light infantry company and a half squadron as enemy force, reservists and regular force members were integrated and trained for 9 days in the cold. The exercise also included participation from the civilian police force, the Mayors of Nicolet and Trois-Rivières as well as police officers from Nicolet's national police school. The soldiers really enjoyed training in the civilian environment. They learned about the complexity of domestic operations and that the avoidance of collateral damage is a major factor to consider while planning. They had to quickly learn how to fight an enemy without damaging their own infrastructure.

In February, we received a visit from a PeeWee hockey team involved in the famous Quebec PeeWee hockey tournament. LCol Landry, Valcartier's CO, had 2 players from the little Boston Bruins stay at his home for the duration of the tournament. We organised a Dog & Pony show and the kids really appreciated the visit.

In March, D Squadron deployed to France for Mountain Operations training with our sister Regiment, the 4e Régiment de Chasseurs. They were trained in cross-country skiing, mountain operations and also received avalanche training. They visited the villages of Gap, Grenoble and the City of Paris.

Finally, the Regiment conducted its annual gun camp in Valcartier where they conducted live fire manoeuvres at the patrol level.

Photo by Cpl Ford

CAPABILITY DEVELOPMENT UPDATES

AFV GUNNERY UPDATE

CAPT D.C. BANKS
AIG TM 2IC

SGT C.J. BULMER
AIG TM LEOPARD 2 SME

Effective Armoured Fighting Vehicle (AFV) gunnery has been, and always will be, a cornerstone of an effective AFV crew. Whether mounted in a LAV III, Coyote, Tactical Armoured Patrol Vehicle (TAPV), Leopard 2 or any other AFV, crews must be able to effectively identify and successfully engage any given threat. The Army Instructor Gunnery Team (AIG Tm) is committed to developing meaningful, relevant and up-to date gunnery training. Several key changes to gunnery have occurred over the past year, most notably the creation of two distinct courses to replace the Army Direct Fire Specialist (ADFS) course, the revision of 25mm turret gunnery QS/TP and Leopard 2 Application of Fire, Interim Crew Gunnery Simulator (ICGS) and Leopard Gunnery Skills Trainer (LGST) software upgrades, and Initial Cadre Training (ICT) of major upgrades to the Leopard 2A4M fleet.

Advanced Gunnery Training

One of the major variables in creating good gunners is the quality of the instructor; ADFS personnel are few and far between and therefore cannot make up the bulk of gunnery instructors in most units. Some instructors will have the necessary experience without the ADFS qualification to teach the fundamentals of gunnery, while others may not. The unfortunate and unacceptable consequence is a variety of different skill levels for gunners across the Canadian Army (CA).

The Direct Fire Instructor in Gunnery (DFIG) course is an immediate response to the varying skill and confidence levels of instructors. Over 13 days, the course focuses on producing excellent gunnery instructors by giving the student instructors a comprehensive understanding of gunnery instructional techniques (7 step classes), coaching techniques and how to properly assess and correct gunnery. While a small portion of the course teaches the theoretical understanding of teaching techniques, the majority focuses on the practical application of gunnery instruction and allows the student instructors to gain a high degree of confidence and skill as Instructors in Gunnery (IGs).

The first two serials of DFIG were conducted at the Royal Canadian Armoured Corps School (RCACS) in mid-November 2015 and January 2016 respectively and qualified 40 new IGs from across the country. Over the coming year a detailed review of the End Course Reviews (ECR's) will result in a DFIG QS/TP being published and the eventual authorization for units across the CA to begin running DFIG at the unit. The goal is simple; create many more IGs to teach gunnery across the army, thus ensuring a high standard of instruction. Populating the CA with additional IGs will create the necessary conditions for gunnery to be taught uniformly and to a high standard across every unit regardless of trade.

DFIG is but one aspect in improving gunnery in the CA. Another key component is the Army Direct Fire Expert (ADFE) course as the follow-on to DFIG. This course will allow senior NCM's and Officers to plan and conduct individual and unit continuation training for AFV crews and provide specialist advice regarding the capabilities and employment of Direct Fire weapons systems and in-service munitions. This course will remain centralized at the RCACS, as the FCoE of Direct Fire mounted gunnery. Just as ADFS once created technical experts, ADFE will continue to generate highly specialized soldiers with a detailed understanding of templating, ballistics, and the knowledge required to create effective individual and continuation training. The first serial of ADFE was

conducted in February 2016 and qualified 27 senior NCMs and Officers to act as advisors to unit command teams.

PAM Updates

The 25mm Turret Gunnery B-GL has been updated to include the addition of the LAV 6.0 to the CA inventory, notably the inclusion of LAV 6.0 gunner and crew commander courses. It also includes the necessary information required to conduct 25mm Crew Commander Upgrade course for armoured units as the gunnery portion is no longer taught on the Armoured Crew Commander (ACC) course. These changes have been put in place to facilitate gunnery training at the unit level while enabling training staff to optimize ammunition usage. The prime example of such training efficiencies occurs when a 25mm gunner course is run parallel to a 25mm Crew Commander Upgrade and both courses meet at the live fire range. In this particular case, units can reduce the ammunition expenditure by almost a third while still qualifying the same number of candidates to the same high standard.

Leopard 2 Application of Fire has also recently been reviewed and updated and will be available on the Army Electronic Library. As with the changes to the 25mm Turret Gunnery B-GL, the changes brought about to the Leopard 2 Application of Fire will facilitate gunnery training at unit levels as the key reference document for Leopard 2 gunnery training.

Gunnery Simulators

Recently the ICGS has been updated to include LAV III and Coyote interface to allow a smooth transition from the LAV Crew Gunnery Simulator (LAV CGT) to the ICGS. The new gunnery simulator has been used during DFIG as a proof of concept and has demonstrated its usefulness as a tool for reducing the number of required vehicles for a 25mm gunnery course by half. In the past, a vehicle per syndicate was attributed to a LAV CGT

The LGST has also recently had its software updated to run the impressive Virtual Battlefield Simulation (VBS) 3.0 software. This upgrade will greatly enhance the ability to network multiple LGST systems while also improving the visual quality of the graphics for the crews operating the gunnery simulator. This undeniable leap in technology will further enhance the realistic training environment for crews while conducting simulation shoots prior to live fire ranges and as a tool for continuation training.

Leopard 2A4M upgrade and ICT

The most recent upgrade to the Leopard 2A4M was contracted between the Canadian Army and Krauss-Maffei Wegmann (KMW) on June 2014. The upgrade consisted of the introduction of a Tactical Navigation (TacNav) to the Commanders System Control Unit (CSCU) and a driver's display. The other major upgrade was the introduction of the third generation Advanced Thermal imager with two-dimensional IR CMOS Array (ATTICA) to both the gunner's IFCS and to the commander's PERI. This upgrade will be applied to the entire Leopard 2A4M fleet. The ICT was conducted in November 2015 at the RCACS SIM Center and included participants from every regiment of the Corps.

The upgrades give the Leopard 2A4M fleet the best thermal optics in the world and an effective TacNav system. These thermal imagers will give the Commanders and Gunners an unparalleled ability to find, define and destroy targets.

Without question, the changes put in place to gunnery training over the past year will contribute to further improve the standard of gunnery across the CA and the Armoured Corps. However, one of the keys to our continued success in training and on operations is our ability to hit hard and hit first. For this reason, gunnery training must remain at the forefront of our collective minds to ensure that CA AFV crews remain some of the best in the world.

As participation in international gunnery competitions (i.e. WORTHINGTON CHALLENGE, the Sullivan Cup and Nordic Challenge) has demonstrated time and time again, we have produced some of the best AFV crews. Nevertheless, we must strive to continue improving gunnery training and the quality of gunners across the CA to maintain our qualitative edge otherwise we risk finishing second best and that's not good enough.

LAV 6.0 RECCE UPDATE – MOVE. FIND. COMMUNICATE.

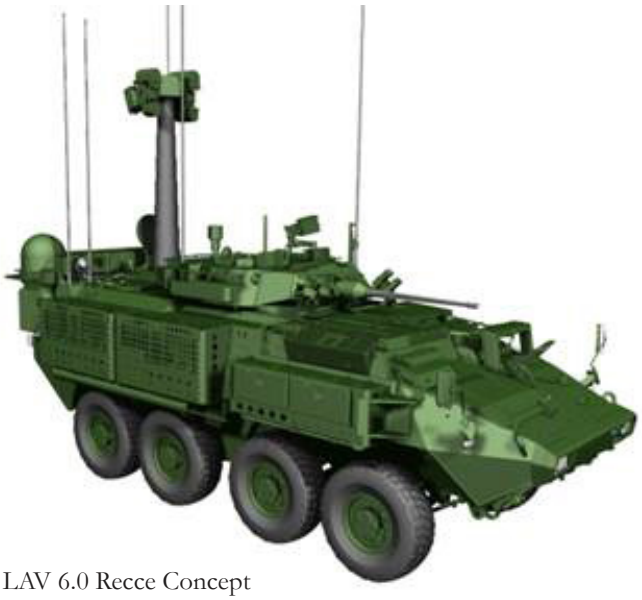
CAPT B.S. JOHNSON,
DEPUTY PROJECT DIRECTOR,
LAV RECONNAISSANCE AND SURVEILLANCE SYSTEM PROJECT, DLR

As announced in the last edition of the Armour Bulletin, the LAV Reconnaissance and Surveillance System (LRSS) Project awarded the $562 Million Contract to General Dynamics Land Systems Canada (GDLS-C) to integrate the winning bidder of the surveillance suite sub-contract's system into the LAV 6.0 RECCE. The winning Surveillance System will be provided by DRS Technologies. The LRSS Project, having recently dropped the 'Upgrade' designation, had its beginnings with the Coyote Life Extension Project and will produce 66 dually-capable LAV 6.0 RECCE to replace 141 Mast and Remote Coyote. Much of this Project's life matured under the watchful eye of Project Director Maj Frank Lozanski, RCD.

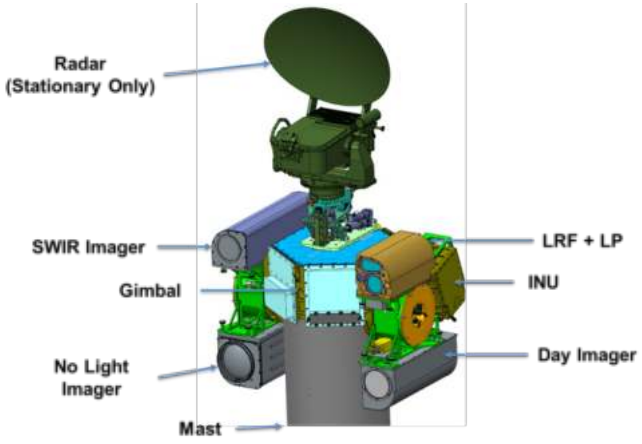
The LAV 6.0 RECCE is based on the LAV 6.0 platform with structural modifications that include a partial raised back deck to accommodate the Electrical Optical (EO) sensors stowed under armour, segmented hatches to allow continued armour protection while the mast is raised, and shifted ramp door to optimize access to the rear compartment. Equipped with High Definition (HD) Day, Short Wave Infrared (SWIR), and Midwave Infrared (IR) Imagers, MSTAR v6 Radar, the LAV 6.0 RECCE can find targets at a far superior range than the Royal Canadian Armoured Corps' previous sensor systems. Upgraded and advanced communication systems enable the LAV 6.0 RECCE to disseminate processed imagery and low level analysed data.

Capabilities

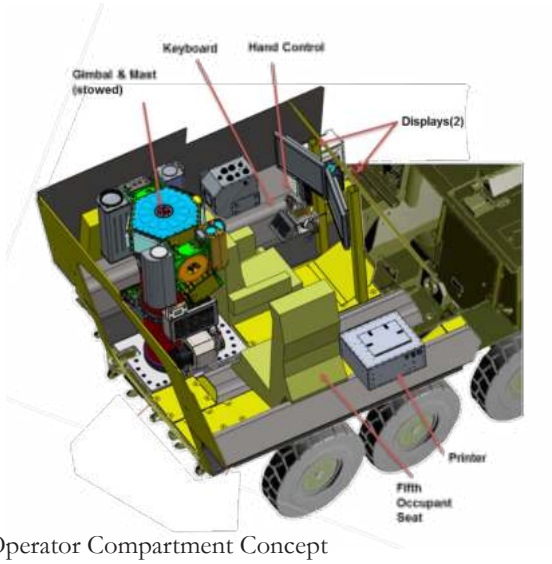
The LAV 6.0 RECCE's purpose is to move tactically throughout the battlefield to find information about the enemy and terrain and then deliver it to the people that need it and is a vast improvement over the COYOTE it is replacing. The LAV 6.0 RECCE inherits the LAV 6.0 Protection of the Double-V hull and Height Management System. Both features are designed to defeat or minimize the effects of an anti-armour mine blast. With the LAV 6.0 Caterpillar C-9 450 HP Diesel Engine with 7 speed transmission and Generation 6 hydro pneumatic suspension, the LAV 6.0 RECCE is capable of supporting 62,000 lbs gross vehicle weight across the battlefield. The LAV 6.0 RECCE will retain the LAV 6.0's Lethality in the form of the 25mm Bushmaster with an upgraded Fire Control System which will allow much more accurate first round engagements.



LAV 6.0 Recce Concept



Mast-Mounted Sensors Concept



Operator Compartment Concept

Along with those of the LAV 6.0, the LAV 6.0 RECCE has some key new or upgraded reconnaissance and surveillance capabilities. Each LAV 6.0 RECCE will be capable of both Remote and Mast operations with fully stabilized mast-mounted sensors allowing On-The-Move employment of the EO sensors. The Remote cable reel is integrated and has a powered retract. The cable reel will have constant connectivity that will allow the operators to quickly dismount and lay out the 200 metre cable while maintaining communications with the Operator Control Station (OCS) and vehicle. The mast is a construction of composite telescoping tubes and will raise the sensor suite up to 10 metres above the ground. With the LAV 6.0 RECCE's OCS, the Surveillance Operator (Surv Op) will be able to operate up to two EO systems and one Radar concurrently while stationary, should the need arise. The stabilized Gimbal, with Global Positioning System (GPS) and Inertial Navigation Unit (INU), along with the strong mast, will allow the Surv Op to scan sectors of observation while on the move. The system includes two lasers; an eye-safe Laser Range Finder (LRF) and an IR Laser Pointer (LP) with 2 power levels. The LRF and INU will allow the surveillance system to achieve an expected Far Target Location (FTL) capability of less than 15m circular error of probability. The LP will provide the ability to indicate targets as far away as 10 km to anyone with night vision devices. The MSTAR v6 Radar will Detect a vehicle at a range of greater than 25km. Subsequently, using HD Digital Day camera and Thermal cameras, Surv Ops will be able to Detect a vehicle size target at greater than 20km and Identify it at greater than 10km.

A digitized and network-enabled OCS advanced software will allow Armd Recce crews to process information gained and transmit over the various Land Command Support System (LCSS) channels. The OCS has two 2Tb Solid-State Hard Drives (SSHD), a Windows 10 Operating System, two MILCOTS 21.5" Multi-Touch Displays, primary and secondary hand controllers, an integrated

Radar Control Screen Concept

EO Sensor Control Screen Concept

keyboard, an energy attenuating seat, and a ruggedized printer; but sorry, no cup holder - I tried. There is also a fully capable secondary OCS that runs from a ruggedized laptop that will allow Patrol Commanders to send reports without monopolizing the primary OCS. An added bonus of the secondary OCS is that it can be tethered a short distance from the vehicle and maintain full system functionality. The Surv Op will be able cue EO sensors using the Radar and set up automatic scanning through a simple interface. The OCS will also have a host of image processing ability including blending of Day and SWIR camera images.

Once information of tactical or strategic value is captured, the LAV 6.0 RECCE has a host of options with which to disseminate it. LCSS equipment include 2x Combat Net Radio-Enhanced (CNR-E) VHF radios, 1x UHF/VHF ground-air radio, Enhanced Position Location Reporting System (EPLRS), and a Satellite Communications On-The-Move (SOTM) system. The LAV 6.0 RECCE will be able to transmit critical reconnaissance and surveillance information Beyond Line of Sight (BLOS) to essentially anywhere in the world. The basic Satellite Communication (SATCOM) capability, which was at a premium in the past, will now be mounted on every deployed LAV 6.0 RECCE. With SOTM, the LAV 6.0 RECCE won't need to stop to aim its SATCOM antenna and thereby increasing its overall security.

A cutting-edge Silent Watch solution will be integrated into the LAV 6.0 RECCE's winch pocket. The Silent Watch Battery Pack (SWBP) will provide in excess of 8 hours Silent Watch via a custom safety and performance balanced Li-NMC battery chemistry developed by Revision Military (yes the same guys that make our eye pro and new ballistic plates). The SWBP will have two levels of power management safety and will even be capable of starting the engine, if required. Inside the armoured enclosure, there are 10 modules that can be individually controlled by the Battery Management System (BMS) so that if one module fails, the entire system is still functional. The SWBP can even function, albeit with less silent watch available, with only four modules active. The downside is that no longer will you be able to store your 4-man tent or box of rations in the winch pocket.

Rear Isometric View of SWBP

SWBP Test Fitting on LAV 6.0

Progress

The LRSS Project is now in the Implementation Phase and, well, there have been some delays largely due to contractual issues. That being said, most of the design work has come a long way since the Surveillance System competition was concluded.

The Project is currently conducting design reviews on all subsystems of the LAV 6.0 RECCE. Full scale mock-ups, using a LAV 6.0 Risk Reduction Unit (RRU), have been built to assess human factors impacts to the OCS in particular. We were able to finally get a feel for spatial relationships of the OCS within the LAV 6.0. User working groups are being conducted to provide feedback on software design and Man Machine Interface (MMI) to ensure that the final product is easy to use and something that Recce soldiers will appreciate.

RRU with Seat and OCS Mock-Up

RRU with OCS Mock-Up

Building on the efforts of the Definition Phase, Mobility Trials are set to be conducted late in 2016 as a confirmatory test to check that design features hold up to the specifications tested during Definition Mobility Trials. Mine Blast Testing on a representative vehicle should take place by the end of 2016 to determine the effects of mine blasts on the complete LAV 6.0 RECCE system with a view to ensuring crew survivability. The Stowage Trial will provide a select few Armoured soldiers the opportunity to cram all our gear into the new vehicle sometime early in 2017. Initial Cadre Training (ICT) and Reliability Availability Maintainability and Durability (RAMD) Trial Familiarization Training in the late spring of 2017 will give the Corps the first true taste of the LAV 6.0 RECCE's capabilities and give an opportunity to establish/confirm initial SOPs and TTPs. RAMD Trials are scheduled to commence in the summer 2017 and will be an intensive endeavour designed to put the LAV 6.0 RECCE through its paces. It will last approximately 5 months and likely involve up to a Squadron's worth of soldiers, including support personnel. Initial Operational Capacity (IOC) should see the LAV 6.0 RECCE ready for deployment (Recce Troop trained to Level 4/5) on TF 1-19 and Full Operational Capacity (FOC) (all 66 vehicles, spares, and support equipment delivered) by end of 2018. The project will Close-Out by the end of 2020.

Paradigm Shift

The advent of the LAV 6.0 RECCE will introduce many changes in how Reconnaissance and Surveillance will be conducted by the Corps in the future. Following are a few of the key considerations.

Organization/Composition of Recce Squadrons. The replacement of the COYOTE with the Tactical Armoured Patrol Vehicle (TAPV) and LAV 6.0 RECCE will necessitate a change in the composition and employment of Recce Squadrons and Patrols across the RCAC. The Corps will have to either adopt mixed Recce Patrols, Troops, or Squadrons depending on what is best suited for whichever particular Operational or Administrative situation. Upon the completion of LAV 6.0 RECCE fielding, the Corps' Recce Squadrons will be roughly 3/4 TAPV and 1/4 LAV 6.0 RECCE equipped. The planned distribution, as seen below, is one Troop's worth (8 vehicles and spare) for each Recce Squadron. A current concept has a Squadron of 3 troops with each equipped with 3 mixed TAPV and LAV 6.0 RECCE patrols with the Troop HQ mounted in TAPVs.

Data security. The high degree of FTL accuracy and high resolution quality and quantity of image products the LAV 6.0 RECCE can produce and retain will pose some special challenges to maintaining security of the LAV 6.0 RECCE's data and data containing devices. This is accomplished, in part, through the use of multiple SSHDs and may also require physical security measures akin to crypto security. When the data storage devices are not being used in the field under positive control, they may need to be locked away to prevent loss or compromise.

Increased responsibility of the Surv Op. No longer will the Surv Op, 'Guy In Back' (GIB), be limited to looking rearward from the air sentry hatch and conducting obstacle clearing drills while conducting tactical movement. They will be gainfully employed (and very busy) providing observation of arcs at a long distance or very close-up detail of closer ranges. With the new and extremely effective sensor suite, the Surv Op will be an active member of the crew while the LAV 6.0 RECCE is moving tactically. They will be able to provide better definition of close points of interest and increased early warning of hazards beyond weapon effects ranges. Because of the effectiveness and value of the new system, I doubt many Patrol Commanders will be dismounting their Surv Ops to conduct Battle Drills or Obstacle Clearing Drills. The Crew Commander will now have to consider where and how to employ a very powerful observation system to best accomplish their mission while moving tactically. They will need to assign specific arcs or areas of concern to the Surv Op and supervise them with greater scrutiny than in the past.

Conclusion

Although the LAV is familiar to the Corps, the LAV 6.0 RECCE will be a completely new evolution in Armoured Recce. The LAV 6.0 RECCE will possess cutting edge technology that will represent a huge leap forward in capability of gaining information on the enemy and terrain through high definition sensors and then relaying that information to the Intelligence, Targeting, Acquisition, and Reconnaissance Network through the myriad of LCSS means on board the vehicle. The introduction of the LAV 6.0 RECCE will, however, necessitate some change from how the Recce Squadrons in the Corps have operated in the past. The Corps will need to come to terms with a mixed fleet and new TTPs for Observation on the move. The LAV 6.0 RECCE is the most complex, sophisticated vehicle ever to be designed and fielded by the Canadian Army and, as was the COYOTE, will again be the envy of the Armoured Recce Community.

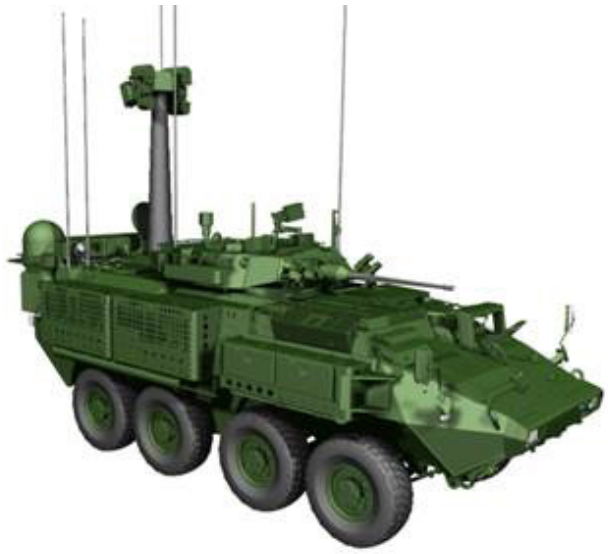
Move. Find. Communicate.

Planned LAV 6.0 RECCE Initial Distribution

THE LAV 6.0 RECCE: ACQUIRING COMPLEX AND LEADING EDGE TECHNOLOGY WITH INNOVATIVE AND COOPERATIVE MANAGEMENT TECHNIQUES

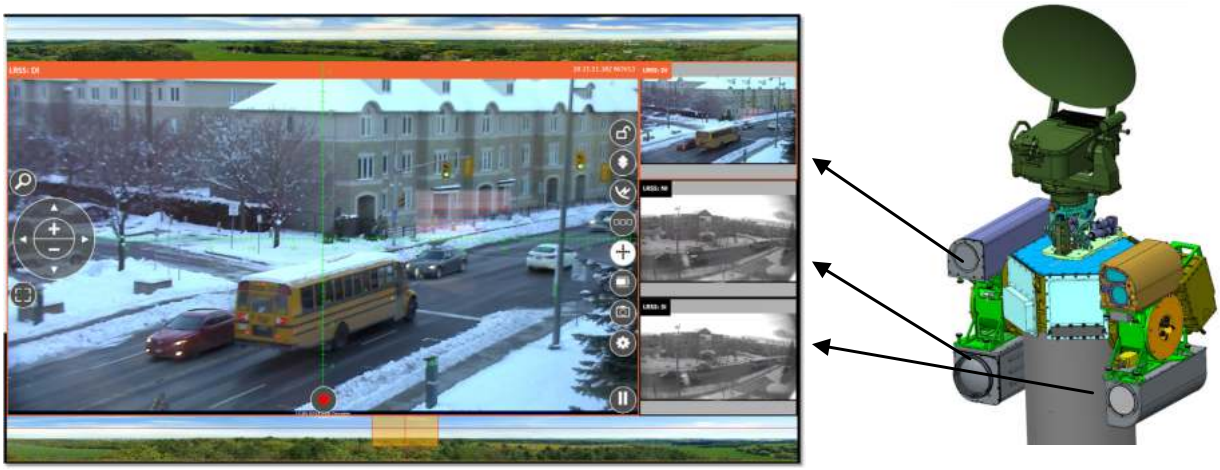
BY JONATHAN KING,
LRSS TEST ENGINEER

Meet the LAV 6.0 RECCE, the future backbone of the Army's Reconnaissance and Surveillance capability. The LRSS (Light Armoured Vehicle – Reconnaissance: Surveillance System) Project has pioneered new contracting and project management techniques to procure what will be one of the Canadian Armed Forces most technologically advanced platforms.



The LRSS Project, embedded within the Directorate of Armoured Vehicles Program Management (DAVPM), has a mandate to replace the aging Coyote fleet with 66 state-of-the-art LAV 6.0 RECCE vehicles. This new Army platform will greatly improve the operational capability, protection levels, and flexibility of the current fleet. The project has recently signed a four-year multi-layered contract with General Dynamics Land Systems – Canada (GDLS-C) that has vehicle deliveries scheduled to begin in the fall of 2017.

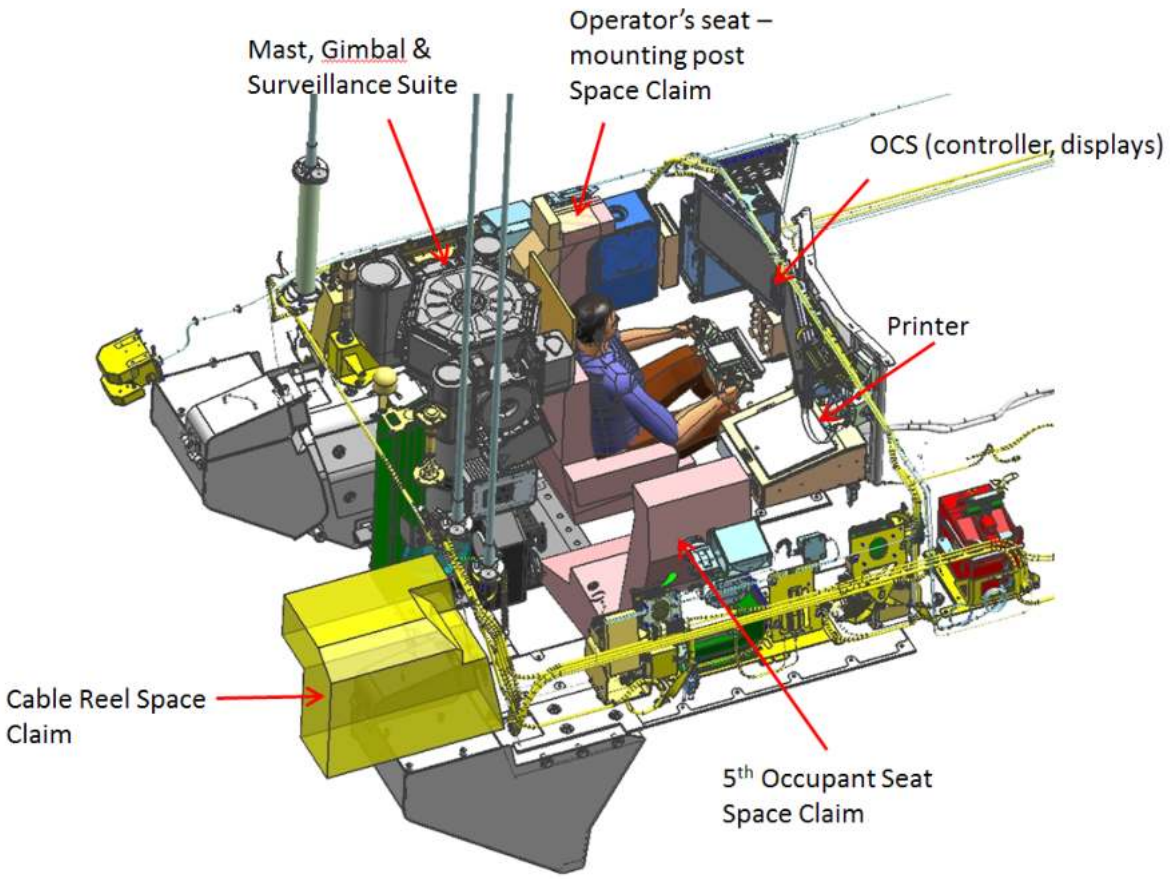
The LAV 6.0 RECCE will be equipped with the latest surveillance technologies capable of unparalleled Detection, Recognition and Identification (DRI) ranges. This new surveillance system, developed by DRS Technologies, consists of integrated Electro-Optic (EO) sensors for the collection, recording, and manipulation of stabilized long-range high definition day, thermal, and Short-Wave Infrared (SWIR) imagery. The system will also have an integrated laser range finder, laser designator, inertial navigation unit, and RADAR. The integrated Satellite-on-the-Move (SOTM)



Model of the Surveillance Suite, RADAR, Gimbal, and Mast with Display Screen Shot

provides a capability for high-speed information exchange with the Land Command Support System (LCSS). The surveillance Operator Control Station (OCS) unites these new technologies using dual 21" touch-screen monitors to provide the operator with an intuitive, fully digitized, man-machine interface capable of controlling every aspect of the Sensor Suite through multiple input methods including a hand controller and/or a tethered laptop. The operator will also be provided with computational tools that easily pre-process intelligence before sending it higher using Sensor Command and Control Planning Suite (SC2PS) and the LCSS network. Furthermore, the LAV 6.0 RECCE will be dual capable, meaning sensors can be mounted on a telescoping 10 meter mast and/or tripod mounted up to 200 meters away from the vehicle.

A major innovation of the LAV 6.0 RECCE will be the ability for crews to conduct reconnaissance operations while On-the-Move or in a Silent Watch mode. The light weight carbon fiber mast will be capable of extending the Surveillance System up to 10 meters while stationary or up to 5 meters in height while driving at speeds up to 50 km/hr. The Surveillance System can be fully retracted into the vehicle and be fully nested under armour simply with the press of a button. The baseline LAV 6.0 winch will now be swappable with a new battery pack that can provide on-board power to permit 8 hours of silent watch surveillance. The new battery pack is exploiting lithium based technology to deliver safe, reliable auxiliary power in all operational environments.



CAD models of the Surveillance System vehicle integration are reviewed using Siemens NX modelling software.

The LRSS project is also breaking new ground by using an Integrated Product Teaming (IPT) approach with both its Contractor and Sub-Contractors to speed up and enhance design collaboration and the decision making process. The use of virtual meetings and an in-house standalone Computer-Aided Design (CAD) workstation running Siemens NX modelling software facilitates quality interaction to quickly assess design modifications and platform improvements. Furthermore, this capability has increased project participation and accountability as team membership can now be based upon areas of expertise (software, hardware integration, testing, or Integrated Logistics Support (ILS)) and is no longer restricted by travel constraints. This management technique promotes efficiency and cooperation, as well as providing DND with immediate insight into contractor and subcontractor progress. Another first within DGLEPM is the contracted regular submission of CAD models.

Did You Know?

QETE (Quality Engineering Test Establishment) is a facility within DGLEPM (Director General Land Equipment Program Management) that has a mandate to provide DND with specialized, technology-based test and investigative services. QETE has specialists from various engineering disciplines who can provide advice and expertise on diverse technical topics such as Electro-Optics (EO) specifications, vibration profiles, and environmental testing standards. A QETE Tasking Request is all that is required to engage their experts.

The LRSS Risk Reduction Unit (RRU) with a 10m surrogate mast being tested on a tilt-table at NRC for the Stability/Mobility testing in Definition Phase.

The LAV 6.0 RECCE will be an exceptionally sophisticated and technically complex Army platform and its ultimate success hinges upon the proper integration of a gamut of new technologies, including revolutionary EO components, to ultramodern software, to advanced carbon fibre materials and battery technology.

In view of the relatively small project staff, it is essential to rely upon the support and expertise provided from the Department's many in-house speciality organizations. LRSS has collaborated and sought valued input from the Directorate of Land Command Support Program Management (DLCSPM) to ensure the seamless integration of the LAV 6.0 RECCE software with LCSS network, software, and communication systems. DRDC and QETE have made significant contributions by assisting with the firing tests on the Silent Watch Battery Pack and by supporting the planned mine blast testing scheduled for later this year. The experts in the Climatic and Vibration Laboratory at QETE continuously provide valued input as the project prepares to start its 18-month qualification-testing program. They will also provide their support through the instrumentation of four test vehicles for the Reliability, Availability, Maintainability and Durability (RAMD) testing that is scheduled to take place in the fall of 2017. The EO section at QETE is constructing custom target boards to adequately exercise and measure the performance of the on-board sensor systems. The Land Engineering Systems Group (LESG) conducted an excellent investigation to better quantify "Light" and "Medium" vegetation specification compliance as it pertains to the design of the LAV 6.0 RECCE mast. Finally, 202 Wksp has met an aggressive delivery schedule by preparing source induction platforms, such as the LAV III TUA and LAV II Coyotes in order to meet the imposed contractual commitments.

The LRSS project has a demanding and aggressive implementation schedule that spans only 54 months from start to finish! Our success in fielding a quality, fully tested, and compliant LAV 6.0 RECCE to the Canadian Army demands new thinking, collaboration, and timely input from our specialists and field units. Our collective results from the past year are a solid indication of a dynamic and quality team who is clearly focused on project success.

BLOS COMMS FOR THE ARMOURED RECCE SQN

BEYOND LINE OF SIGHT COMMUNICATIONS FOR THE ARMOURED RECONNAISSANCE SQUADRON

BY CAPTAIN O.Z. BÉLANGER-NZAKIMUENA
TECH ADJT STDS SQN, RCACS

The concept of Adaptive Dispersed Operations (ADO), as introduced by Canadian Army Land Warfare Center (CALWC) in Land Ops 2021, seeks to create and sustain operational advantage over adept, adaptive adversaries. This, in turn, aims to be achieved through the employment of adaptive land forces alternatively dispersing and aggregating throughout the multidimensional battlespace. With dispersion defined in relation to time, purpose, and space, and the future security environment described as highly volatile and uncertain, ADO are more likely to be conducted by land manoeuvre forces within non-contiguous widely dispersed AOs. Due to its independent and flexible nature as a mounted combat asset, it becomes intuitive to assert how armoured reconnaissance fits as one of the foreground actors primarily expected to face the nature of the future operational environment and thus, being directly impacted by the concept of ADO.

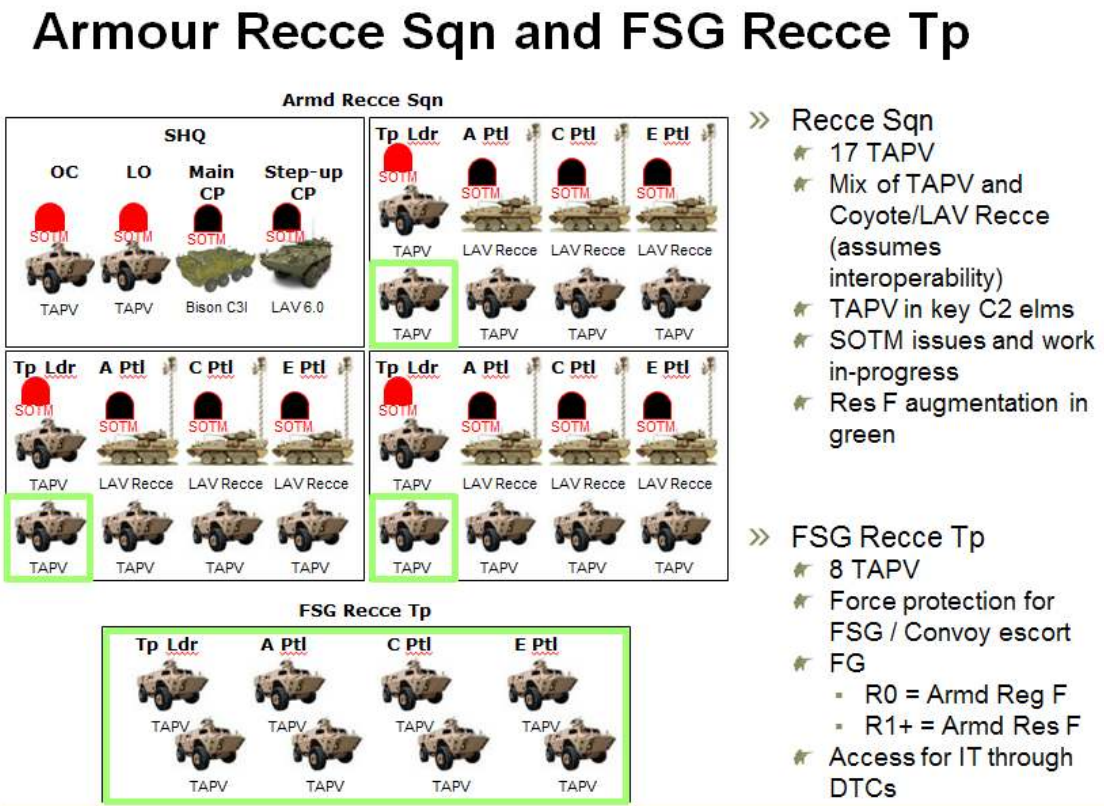
Land Ops 2021 notably sees the requirement for adaptive forces to be net-enabled and thus equipped to be linked by voice and data providing the necessary level of situational awareness to address the demands of ADO. However, in recent years, a capability gap was identified in current Land Command Support Systems which prevents commanders and other specialist users from adequately exercising the required C2 while on the move and/or at extended ranges. This was aimed to be addressed by capability 2 (support of battle command on the move) of the Land Command Support System Life Extension (LCSS LE) project which identifies the requirement to provide on-the-move, high capacity, tactical Beyond Line of Sight (BLOS) communications. As a cohort who is sometimes operating to distances beyond the operating range of current Very High Frequency (VHF) tactical communications, this capability gap was also recognized by the RCAC to be of prime importance in ensuring the future armoured reconnaissance squadron's communication effectiveness in ADO.

Prototype installation of the SOTM antenna on a LAV 6.0

While this requirement was captured in the scope of the Light Armoured Vehicle (LAV) Upgrade project (LAV 6.0) through the Satellite-On-The-Move (SOTM) system of the LCSS LE project delivered under the Capability Pack (CP) TOPAZ (which also includes the Combat Net Radio Enhanced (CNR(E) of the self-titled project), it was left outside the scope of the approved funding for the Tactical Armoured Patrol Vehicle (TAPV) project leaving only 12 SOTM systems allocated to the TAPV and installed as a retrofit once delivered. This installation is itself contingent to an exhaustive engineering assessment on the possibility of such an option.

The current RCAC Force 2018 armoured reconnaissance squadron structure sees both the TAPV Recce and LAV 6.0 Recce platforms operating in mixed vehicle patrols along with TANGO patrols fully mounted on TAPVs with the Squadron Commanders and Squadron Liaison Officers also equipped with TAPVs. This transition reflects a requirement of five SOTM systems dedicated to key C2 nodes on TAPVs per squadron in order to enable commanders to communicate forward to their patrols equipped with SOTM on LAV 6.0 Recce platforms and back to Brigade HQ. Considering the current amount of SOTM systems allocated to TAPVs, this would be enough to equip the number of key TAPVs for two squadrons. Furthermore, to acquire more SOTM systems for TAPVs would necessitate approval on additional funding outside the scope of the TAPV project. In addition to the engineering work required to confirm that the system can be effectively mounted on the vehicle, this leaves the capability for TAPVs to accommodate the SOTM system to be uncertain thus leaving a possible gap for armoured reconnaissance squadrons to effectively communicate in BLOS operations within ADO.

In light of this problem, a joint effort between RCACS Standards Squadron and DLR 4-4 (LCSS LE Project Director) was undertaken in an attempt to present multiple COAs to address this possible issue. An analysis was first conducted by RCACS Standards Squadron leading to a briefing note which highlighted key recommendations on armoured reconnaissance squadron communication requirements with regards to dispersion, structure, and roles of the reconnaissance squadron's key positions.



Current Force 2018 Armoured Reconnaissance Squadron with corresponding current (black) and desirable (red) mounted SOTM systems

In turn, this analysis served as a reference to DLR 4-4 for producing a presentation outlining possible armoured reconnaissance squadrons BLOS communication COAs in anticipation for 18-19 November 2015 Army Capability Development Board (ACDB). More particularly, three COAs for both voice (VCOA) and data (DCOA) were presented, ranging from Tactical Satellite Communications/SOTM Voice/HF for primary voice, to SOTM installation on TAPV/Armoured Corps Internal Re-Distribution or Army Re-Distribution of vehicles for data:

VCOA 1 :
- Primary: Tactical Satellite Communications (TacSAT)
- Alternate: VHF
- Contingency: IRIDIUM
- Emergency: NIL

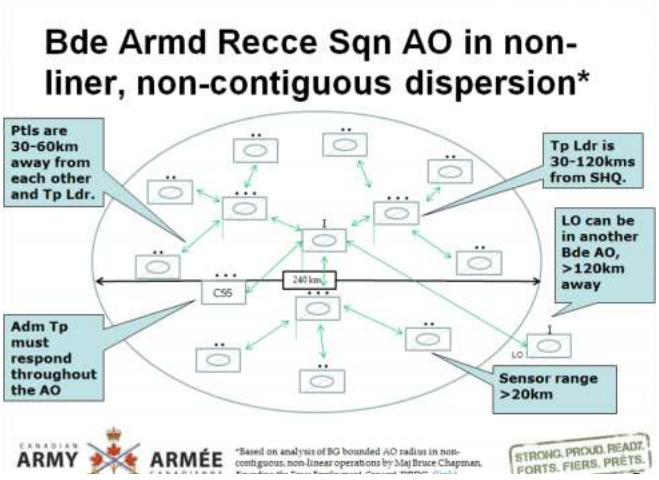
VCOA 2 :
- Primary: SOTM Voice
- Alternate: VHF
- Contingency: IRIDIUM
- Emergency: NIL

VCOA 3 :
- Primary: High Frequency (HF)
- Alternate: VHF
- Contingency: IRIDIUM
- Emergency: NIL

DCOA 1 - SOTM onto TAPV :
- Install SOTM systems into select C2 TAPVs (5 per Squadron)

DCOA 2 - Armoured Corps Internal Re-Distribution :
- Re-distribute platforms within armoured reconnaissance squadrons to enable C2 elements with medium/large data

DCOA 3 - Army Re-distribution :
- 5 x LAV 6.0 CPs per armoured reconnaissance squadron allocated to replace TAPVs in command/liaison roles (i.e. OC, Troop Leaders and LO)



Example of dispersion for an armoured reconnaissance squadron within a non-linear/non-contiguous AO

While a recommendation was made to further develop a COA that provides HF for voice and SOTM for data (along with the optimal numbers desired from the RCAC to be mounted on TAPV platforms), a deeper analysis was requested in order to more fully consider modifying the sub-unit organization and equipment as well as options for whole fleet management while on the road to high readiness and alternative methods to span the communications distances. Finally, DLR indicated that he would not exclude any options until the possibility to configure the SOTM system is confirmed. ACDB therefore endorsed the continued investigation of all options to mitigate this capability deficiency.

TACTICAL ARMOURED PATROL VEHICLE (TAPV) UPDATE

CAPT K.W. CUSHING

Another eventful year has passed on the TAP-V project and the Canadian Army (CA) is coming ever closer to fielding the TAP-V and benefitting from the capabilities it will deliver. Last year's update ended with the conclusion of Reliability, Availability, Maintainability and Durability (RAMD) testing at CFB Valcartier and the identification of design changes required prior to the vehicle being accepted by the CA.

Since that time Textron Systems Canada Inc. (TSCI) has re-evaluated many aspects of the vehicle design in preparation for a second round of RAMD testing to be conducted at the Nevada Automotive Test Centre (NATC) in Silver Springs, NV, USA. NATC was chosen for this testing because it offered a well-defined selection of routes to simulate Canada's TAP-V mission profile. Additionally, NATC's professional drivers would operate the vehicles in the required manner over these selected routes. Canadian soldiers would operate the TAP-V's Remote Weapons System (RWS) and supervise maintenance procedures performed by TSCI. The test plan included an accumulation of 130 000 km of driving between the eight TAP-Vs and 4 700 hrs of RWS silent watch operation.

In August 2015, 28 soldiers from the RCACS, RCD, 12e RBC as well as all three R22eR battalions and a selection of maintainers, many of whom were involved in the initial RAMD testing at CFB Valcartier, travelled to NATC to support RAMD testing. RWS training was conducted by Rheinmetall Canada (a sub-contractor of TSCI) for soldiers who were not already familiar with the weapon system. All soldiers were able to explore the TAP-V and see the implementation of design changes they had suggested during the previous RAMD including the mounting locations of RWS control grips and stowage options.

Commencement of RAMD brought mixed results. The RWS performed extremely well and demonstrated a high

level of reliability. The TAP-Vs themselves performed well on all terrain with the exception of the severe cross country routes where steering issues resulted in a pause to road testing for a re-evaluation of the steering design. Testing of the RWS was paused at 60% of the total required hours. At the time of writing this article, TSCI is still in the process of developing an engineering solution to provide the required mobility across all types of terrain. It is anticipated that RAMD will begin again in January 2016 to complete the remaining kilometers of driving and hours of RWS silent watch.

While the project still has challenges to overcome, progress is continuously being made. A Logistics Demonstration was conducted from September to December 2015 at the Land Engineering Support Centre in Ottawa where CA maintainers worked with representatives of TSCI to verify TAP-V maintenance techniques and procedures to ensure dependable support to the fleet. Despite the appearance of setbacks, the deliberate and systematic approach to vehicle design changes ensure that the TAP-V the CA receives meets its needs. The first scheduled deliveries of TAP-V remain early 2016 to units at 5CDSB Gagetown.

THE ARMY TECHNICAL STAFF OFFICER (ATSO) PROGRAM A STUDENT'S PERSPECTIVE

CAPT K.W. CUSHING

According to the annual CANFORGEN the ATSO Program aims to produce competent technical staff officers with a broad based knowledge of science and technology, management and critical thinking, and the ability to apply that knowledge to the needs of the army. While this statement and the remainder of the order hint at what the Applied Military Science (AMS) Department at the Royal Military College of Canada deliver, the tech staff experience involves much more than that. This article gives the perspective of one student on select aspects of the ATSO curriculum, learning environment, and employment upon graduation.

The ATSO program combines academics, field studies, and guest lectures to teach the broad strokes of science, technology, and project management as they pertain to solving military problems. Through field studies students learn about Canada's defence industry and the national research and development organizations that are eager to support capability development. In addition to the program's core courses such as math and physics, students complete a group research project which applies science and technology to solve actual problems facing the Canadian military. The culmination of the project and ultimately the entire program is a symposium where groups present their projects to a diverse academic and military audience. Underlying themes throughout the program are the development of critical thinking and communication skills. Students examine problems from a variety of perspectives leading to well-reasoned recommendations and present them either verbally or in writing. In all, AMS provides a challenging and stimulating academic environment.

AMS students belong to either the ATSO or Army Technical Warrant Officer Program. Currently, there is no significant difference between the programs and all students regardless of rank or trade attend the same lectures, complete the same assignments and participate in group work together. The course staff also have a diverse background and extensive experience in the field of capability development which they apply to the subject matter. Perhaps the most enlightening aspect of the program is the opportunity to work closely with individuals of such diverse backgrounds and experience. Working to solve problems collectively and understand what others think are important military capabilities is an eye-opening experience. The connections made during the year also provide many resources to draw upon after graduation.

Following AMS, graduates are employed in a variety of positions across the CAF. Approximately half of graduates will be posted to positions directly involved in capability development while a significant number will be employed in other positions where technical

knowledge of army matters is a benefit. These positions include Technical Adjutant at one of the Combat Training Centre schools, Trials Officer at the Canadian Army Trials and Evaluations Unit, staff positions supporting CMTC or a Divisional headquarters, among others.

The tech staff program develops students who understand how technologies generate capabilities and the impact these have on army doctrine and operations. This area of study and employment is as rewarding as it is challenging and presents an excellent opportunity to enable CAF capabilities in the years to come.

DOCTRINE AND STRUCTURE

THE UNDERLYING ROYAL CANADIAN ARMOUR CORPS NARRATIVE

MAJ S.G. POPOWYCH

Most readers of this publication are likely to accept the continued existence of the Royal Canadian Armoured Corps (RCAC) as a foregone conclusion, viewing the Corps as an immutable institution anchoring the very core of the Canadian Army. This article seeks to challenge that point of view by examining the continued investment in Armour among small armies with a view to sparking a dialogue surrounding the narrative of the RCAC. Understanding that the aim is to spark dialogue, an exhaustive analysis of the unique battlefield capabilities that Armour platforms operated by Armoured soldiers represent will not be presented though there is merit to such a body of work. Many points of view exist surrounding structure, equipment, platforms and training but seldom do we pause to consider the need for our narrative to reinforce the continued existence of the Corps as an independent manoeuvre arm. Though a topical subject, this article will not seek to address another aspect of the Corps narrative, namely the spectrum of Armour tasks and the tactical employment of Armour within the Canadian Army.

While few would debate the assertion that Canada possesses a relatively small army, seldom is significant thought given to what this means for the RCAC. The fact is that the decision to continue to invest in an independent Armoured Corps represents a fundamental strategic choice for a small army. An independent Armoured corps requires dedicated structures, platforms, training institutions in addition to Combat Service Support, including Armoured recovery units and commensurate mobility assets such as Armoured Engineers. All of these things could be recapitalized in a variety of ways, particularly in the current departmental climate where manning levels are being trimmed to reinvest in joint enablers and new capabilities, further threatening already hollow force structures. Not long ago, the demise of the tank in Canada was a certainty. The employment of the Armoured Corps, though debatable across a spectrum, remains highly subject to the platforms it is equipped with. Were a direct fire capability as we know it not to be replaced, it would not be long before a fundamental existential discussion took place regarding the future of the RCAC.

What is it then that makes an Armoured Corps worth investing in for a small army? The question is not new. To spark discussion, two aspects of an answer are considered: the continued role for direct fire platforms on the future battlefield and the unique capability of Armoured soldiers. If there is merit to the assertion that Armoured platforms are required on the battlefield, then only half of the question has been addressed. It is critical to demonstrate what skills Armoured soldiers bring to the battlefield and how the difference between these skills and those of the other combat arms, particularly the infantry adds value. If the difference in skills/capabilities of Armour soldiers is not so unique as to represent a capability gap (vice a diminished capability), then the future of the corps is in jeopardy. Typical conversations surrounding the skill set topic usually default quickly to emotive invocations of big hand small map thinking and progresses to derogatory war stories being told. Little rigorous analysis has taken place to quantify the skills/aptitudes of Armour soldiers vis-à-vis our team mates but our Corps is the only one whose existence depends on the results of such an analysis in one way or another.

The question of the future need for Armour capability on the battlefield is not overly contentious but important to discuss all the same. One can only defend the existence of the Armoured soldier once the need for Armoured forces has been established. Throughout History, Armour forces have brought unique and often revolutionary capabilities to the battlefield. During the First World War, the Tank was introduced to restore battlefield mobility through protection. Often overshadowed by debates regarding the effectiveness/timeliness and mass of tanks to this conflict is the debate that was sparked regarding the future of the Cavalry. This debate was largely platform centric, having to do with the future of the horse. At the time, Cavalry formations were defending the horse and its intractable place in the modern army while others advocated for motorized forces and Armoured units. Rising a level above this contemporary mindset was a clear recognition that there was a need for the capability that both cavalry and armoured formations brought to the battlefield. In this context, debate was over form and function and not over the need for Armour and Cavalry units.

During the Second World War, tanks used speed to manoeuvre to a position of advantage, here a function of mobility and mass. Shock action was achieved by

manoeuvering massed formations to decisive points in close concert with other arms. The dramatic success of such manoeuvre cemented the place of Armour on the battlefield for decades to come. In the background, several militaries continued to rely on the horse, though increasingly in a logistical role. Cavalry and motorized recce units executed reconnaissance and other combat support tasks but the existence of the Armoured corps was not open for debate. Then the cold war froze in time our perception of the battlefield with our focus solely oriented towards the large scale operational manoeuvre groups fielded by Soviet forces.

In the Cold War years, the Tank obsolescence debate began to take the form that previous discussions surrounding the horse had taken. The 1973 Yom Kippur war was heralded by some to signal the end of tank dominance owing to the dramatic impact of the anti-tank guided missile. By the time the First Gulf War arrived, large scale manoeuvres by Armoured formations were again utilized to achieve decisive effect in overwhelming Iraqi defences. Armour had achieved a relative pinnacle of optimization between firepower, mobility and protection. Tank development has not ceased but a general recognition that it is not particularly advantageous to simply make giant tanks, pushing the envelope further. This recognition has set up some of the development of active protection systems designed to defend against increasingly lethal ATGMs (tandem warheads, top attack) that are prevalent today.

For the Canadian Army in Afghanistan, tanks provided force protection through increased mobility (actual and through breaching) and shock action (intimidation on the moral plane). The actual employment of Armour, driven by the need for specific capability, for the first time started to break the mold with respect to the perception of how Armour should be employed that was cast during the Cold War. At present, numerous battlefields to include Lebanon, Ukraine and Syria are seeing continued employment of Armour, often in non-traditional roles. Armoured forces are appearing in smaller numbers (as opposed to massed formations), they are increasingly used in complex terrain remain highly lethal in both conventional and irregular settings. Deriving an analysis from current battlefield threats, Armour forces will need to deliver important capabilities into the future. First, the ability to dominate light and medium forces represents a key aspect of the lethality that Armour will bring to the future battlefield. In some cases, such as irregular warfare, the guaranteed overmatch on the physical and moral planes represents a genuine game changer. When considering medium and heavier threat forces, Armour represents the ability to fight for information in an environment where increasing use of unmanned and autonomous systems means that reconnaissance tasks will evolve into the ability to survive first contact and maintain contact, engaging an opposing force until a main body arrives. Both scenarios suggest that it will be advantageous to employ Armour both within infantry organizations and as an independent element based on the nature of the threat.

Having briefly described why Armour has been and continues to be a critical component of a force who wishes to operate across much of the breadth of the spectrum of conflict, it is now possible to explore the question of why Armour needs to be employed by dedicated armoured soldiers. Two skills possessed by the armoured soldier are briefly outlined below, presented here with a view to provoking thought and are not offered as an exhaustive description.

Experiences in Afghanistan, particularly with respect to employment of tanks, reinforced the continued importance of the all arms team. It is specifically the ability of commanders to fully leverage all elements of the team that allowed the whole of a fielded force to achieve greater effect than one might suspect by simply considering the sum of the parts. Equally valuable was the ability to switch up lead elements based on the task. At first glance, it seems that there is value in the ability to look at a problem set from multiple perspectives and adopt an approach most suited to the problem. While both infantry and Armour officers are trained to synchronize fire and manoeuvre in space and time, it is precisely the ability to master the individual effects that these arms bring to the field that makes them, and more specifically the difference between them valuable. While infantry officers can certainly lead a combined arms team in terrain suited for tanks, the Armour officer is innately more capable of directing tanks in open battle. Conversely, though an Armour officer could lead a combined arms team in complex terrain, the infantry officer is innately

more capable of directing infantry in urban terrain than is the Armour officer. Though this may seem pedantic and rhetorical, accepting this conclusion by necessity suggests that an infantry officer trained to operate tanks does not equate to an Armour officer in terms of the ability to prosecute operations where armour platforms are suited to lead.

There does not seem to be any body research that has definitively quantified this school of thought. While certainly those involved in personnel selection, recruiting and operational research have investigated aptitudes that indicate a person's relative chances of success at performing a given function, none of this has sought to quantify the resulting outcome of a training regime oriented towards either Infantry or Armour skill sets. Having said that, it is worthwhile to consider a select few aptitudes based on the outcome of Armoured corps training as this remains fundamental for making the case for retention of Armour as an independent manoeuvre arm. While both Armour and Infantry soldiers are required to understand time and space relationships, they use these relationships in different ways, on different scales and at different speeds. Both trades need to navigate, estimate ranges, manoeuvre over terrain and manage an area of operations. The key difference is the scale, scope and speed at which these relationships are considered and managed. At a very basic level, the battlefield footprint and range band of Armour forces is an order of magnitude larger than those of Infantry forces. The end result of the way these aptitudes are nurtured and developed over time is a different cultural lens through which problems are perceived. While an infantry leader may be more details oriented and think a problem through from bottom up, an armour leader may take the opposite tack, focussing on interactions between larger moving parts, then progressing down into the details. This relationship, when paired creates a dynamic tension that is complementary and valuable in ensuring comprehensive considerations of a tactical problem. Removing one part of the team constrains the collaborative environment to one point of view. This is not meant to make any derogatory commentary against the mindset of the Infantry corps, rather it would seem evident that removing half of the manoeuvre thinkers from collaborative planning teams represents a fundamental reduction in the ability to formulate unique COAs, particularly in an environment where an independent Armoured force or large scale mounted manoeuvre is required.

Armoured soldiers are often empowered and entrusted with greater degrees of independent responsibility than their peers. As a crew commander in an environment where platforms like tanks are pushed down to sub-sub unit groupings, a Master Corporal plays a critical component of the all arms team. In a similar vein, the Armoured patrol commander deploys at comparatively great distance from central leadership, executing enabling tasks in support of formations that directly inform manoeuvre decisions taken by commanders. While the degree of autonomy here described could easily be attributed to a sniper, very few infantry soldiers are trained as snipers whereas all Armour leaders are trained as crew commanders and employed as such as a baseline component of their career progression. Throughout a career, this translates to master warrant officers who are entrusted to command echelons, a critical component of adaptive dispersed operations. Though this forum is well aware of the importance of the echelon system to our current and future modes of operations, nowhere else in the army do Master warrant officers independently deploy organizations of such size and complexity. This skill adds value to the army by developing leaders who by default understand risk acceptance and mitigation and who are fully steeped in mission command while being routinely employed to act independently in support of commander's intent.

The dialogue that this article has sought to promote is important for the health and success of our Corps. It is viewed as a complementary effort to the narrative presenting the RCAC as the masters of mounted manoeuvre. By promoting the skill set of the armour soldier, establishing a capability need for the employment of Armour and clearly articulating the tactical tasks that the RCAC can execute, the continued investment in a vibrant Armour capability within the Canadian Army is easier to achieve.

BRIGADE AT READINESS AND THE ARMOUR CORPS

MAJ D.L. CHILDS,
CANADIAN ARMY HEADQUARTERS

In Armour Bulletin 2014 I raised the challenges associated with ongoing Canadian Army (CA) transformation, namely Force 2018. These challenges emerged as a result of the adoption of Force 2013 establishments (structures, personnel and equipment) and have been aggravated, in my opinion, by the lack of external stressors that would highlight weaknesses in the current approach. Three specific examples were used to demonstrate the challenges faced: asymmetry, the Armour Reserve and the role of Regimental Headquarters (RHQs) Asymmetry has no easy solutions and will continue to place disproportionate demands on the Regular Force Regiments which will result in support from outside the lead mounting division (LMD). Increased reliance on the Armour Reserve to sustain operations necessitates well-refined integration and affiliation between the Regular and Reserve Forces. Finally, the omission of the Regular Force RHQs from battle group headquarters (BG HQ) tasks in Force 2013 and the Managed Readiness Plan (MRP) has questioned the role of this organization: force generation HQ vice BG HQ.

A recent initiative advanced by Commander CA, namely the Brigade at Readiness, sees a shift in focus from the production of individual task forces in support of Canada First Defence Strategy (CFDS) missions to the preparation of an entire brigade from which missions can be filled. In the absence of a specific mission, the force generation building block will be the brigade vice the battle group, battalion group or battalion as it has been. While the latter options will remain viable solutions for many missions, the focus will be placed on the preparation of an entire brigade and its enabling elements.

The advantages of the Brigade at Readiness are numerous. The brigade, as the primary mechanism of joint integration in the CA context, could combine all of the missions under a single, unified and pre-existing structure enabling economies of effort. This acknowledges that, for many enabling elements, integration occurs at the brigade-level as noted at the figure. As integration of coalition partners (or of Canada within coalitions) and joint operations are most likely to occur at the formation level, the Brigade at Readiness reasserts the significance of the brigade and the brigade HQ as a major force generation output for the CA. It creates the potential, within resource limits, of elevating additional battalions/regiments to high readiness and refocuses services battalions, engineer regiments, artillery regiments and signals squadrons in support of the entire formation.

In terms of external-CA communications, the Brigade at Readiness may, for the first time, provide a viable narrative that explains the CA especially to civilian bureaucrats, politicians and other governmental departments. The Royal Canadian Air Force (RCAF) and Royal Canadian Navy (RCN) have had much success in this regard as planes and ships are easily understood and focus the discussion (e.g. providing a six pack of CF-18s requires a squadron of support staff, as demonstrated during Operation IMPACT). While the current "soldier-centric" CA narrative explains our focus on people it does little to explain the myriad of organizations and equipment we employ. The Brigade at Readiness may provide the CA with a simple solution: the building block is a Brigade and every capability the CA owns can reside within that formation. Additionally – and perhaps more importantly – movement away from the current MRP listing of specific units, sub-units and sub-sub-units will discourage the overly tactical fixation both inside and outside the CA.

Despite the advantages above, the Brigade at Readiness has a number of known disadvantages at all levels. Strategically in terms of communication outside of the CA, the MRP did a very good job of justifying the entire CA structure. The reduction in detail under the Brigade at Readiness will not enable that clear communication which will be complicated further by the resource demand. Training more personnel – the logical deduction of preparing an entire brigade – will require more resources, which reinforces a common misunderstanding outside the CA that we over-train. This situation will undoubtedly be compounded by associated, unrestrained expectations,

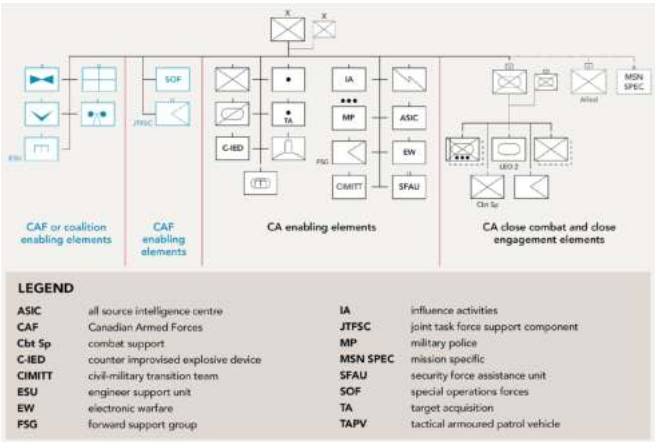
a longstanding and particularly troublesome challenge for the CA. While the intent may be to do more within the current resource envelope, it is more likely that additional resources will be sought and found to feed expectations. The after action review of Exercise MAPLE RESOLVE 2016 should be especially telling in this regard.

Operationally, the existing concurrency risk – units tasked with multiple CFDS-related contingency plans (CONPLANs) and missions – could worsen, especially if all expeditionary high readiness tasks are placed within the Brigade at Readiness. While the risk of multiple concurrent missions is low, it is a risk nonetheless. Tactically, actual capacity at the unit level will be a significant issue. An examination of the service battalions reveals understrength units with focus divided between simultaneous support to the brigade, support to the institution (i.e. base) and support to internal training and professional development; service battalions have already emerged as a key limiting factor. Within the regiments and battalions, the Brigade at Readiness does little to address the prevailing hollowness in many units; training more high readiness units may be confused with having more soldiers or complete sub-units available.

In terms of effects on the Armour Corps, the Brigade at Readiness has tremendous potential to resolve the Force 2013 shortcomings mentioned in the introduction. For Exercise MAPLE RESOLVE 2016, the LdSH(RC) have been tasked as one of the three BG HQs, which is movement in the right direction. It now remains to be seen if the same approach will be adopted in the other divisions. The Brigade at Readiness concept also holds the potential for better integration of the Primary Reserves within high readiness training (e.g. 4 Division's Operation REINFORCEMENT). Focus on integration should improve the ability of the Armour Reserve to both force generate its own capabilities (e.g. Forward Support Group Recce Troop) and to augment the Regular Force (i.e. individual and crew augmentation). In turn, this should both test and adjust the force generation mechanism thereby greatly improving the response to a named mission. All that said there are a number of Armour Reserve issues that will need to be addressed, equipment deficiencies being the most apparent. While the Brigade at Readiness offers no solutions, it does provide a stimulus to address these issues as a matter of necessity.

While the Brigade at Readiness does not specifically address issues associated with Armour Corps asymmetry, it is indirectly putting pressure on the Armour Corps to sustain certain capabilities. As a case in point, the ambition for Exercise MAPLE RESOLVE 2016 was for three tank squadrons which were eventually reduced to two due to fragility in the sustainment systems. Given the low density nature of the capability and the growing demand, expectations associated with the Brigade at Readiness will create pressure to re-balance skills within the three Regular Force regiments. As previously briefed by Director Armour, an "experiential" approach to symmetry may provide more personnel with tank skills, improve the depth of a low density capability and provide a more achievable solution than through traditional fixation on structures.

It remains that Armour Corps issues associated with Force 2013 need to be resolved. While Force 2018 should address some of these issues, the emerging Brigade at Readiness may offer more immediate and tangible results. At the very least, the Brigade at Readiness and the ambitions associated with it will provide an external stressor for the Armour Corps and therefore motivation to address Force 2013 shortcomings.



Example of dispersion for an armoured reconnaissance squadron within a non-linear/non-contiguous AO

ADAPTIVE DISPERSED OPERATIONS AND THE ARMOUR CORPS

BY MAJOR D.L. CHILDS,
CANADIAN ARMY HEADQUARTERS

Land Operations 2021 Adaptive Dispersed Operations: The Force Employment Concept for Canada's Army of Tomorrow outlines the concept under which the Canadian Army (CA) needs to operate in order to meet current and future challenges. Unfortunately ADO was never sufficiently developed beyond the concept stage meaning that many aspects have yet to be operationalized; there is a gap between ADO concepts and tactically application by Armour Corps and others. Rather than attempt to address the entirety of ADO, this article will focus on a single aspect as a means of demonstrating the work that needs to be done. Specifically, the focus will be on the aspect of dispersion which contains three specific applications under ADO: dispersion in space, dispersion in purpose, and dispersion in relation to time.

Dispersion in space is the most misunderstood of the three applications. In "Bounding the Force Employment Concept" Maj Bruce Chapman addresses misconceptions fueled by Afghanistan operations and ambiguity within the ADO concept by restating some facts about the nature of areas of operations (AOs). In short, the mission, threat and forces involved would continue to dictate the size and composition of AOs as outlined at the figure. Additionally and more specific to non-linear operations, the potential size of AOs would be influenced by several key limiting factors, chief among these being indirect fire support, casualty evacuation, resupply and command and control. In addition to reinforcing extant doctrine and providing factors for consideration, Maj Chapman's work demonstrates the additional effort required to refine aspects of ADO and therefore the gap that exists.

Dispersion in space highlights two lessons for the Armour Corps: be mindful of all doctrinal tasks; and understand the factors affecting dispersion in space. For Armoured Recce Sqns, there will remain the requirement to adjust to the size of the AO, nature of the threat and assigned tasks. Recce Sqns are traditionally adaptable and the challenge will be the maintenance of that flexibility. This requires continual practice across a wide range of skills and, unlike Afghanistan, preservation of the flexibility of the formation by keeping the Recce Sqn at the formation level (vice embedded like a company in a battle group). There is also a number of technological challenges that will need to be closely monitored as they have the potential to limit dispersion in space: beyond line-of-sight (BLOS) communications, data transfers and integration of new sensors.

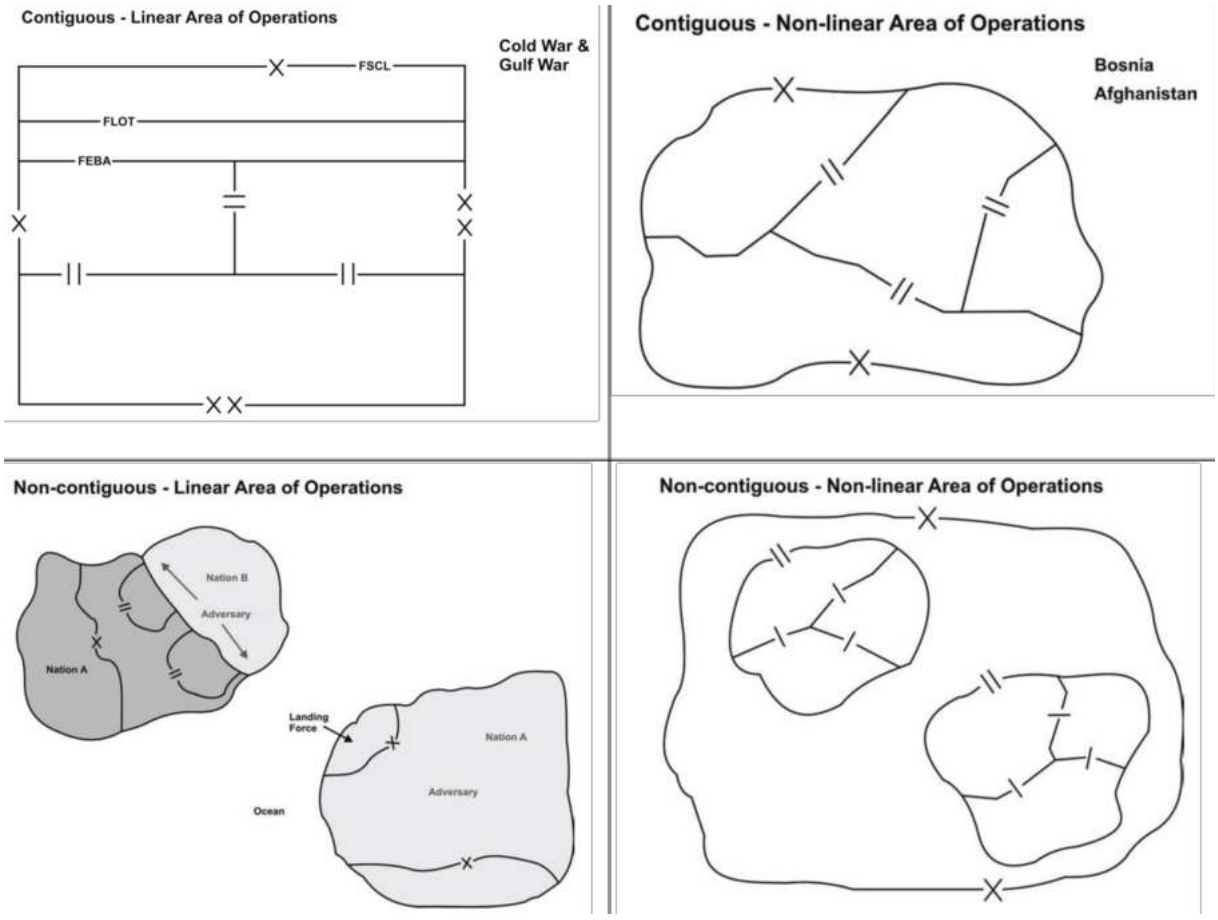
For the Tank Sqn, dispersion in space is far more doctrinally challenging. The presence of limited armour and the requirement for rapid aggregation (i.e. massing) to achieve effects is well understood in a near-peer, high intensity conflict. In lower intensity conflicts, massing is not as significant as mere presence to achieve tactical overmatch and standoff. Therefore, when dealing with more asymmetric and non-conventional threats, there will be a corresponding desire to increase the distribution of tanks: smaller groupings in more locations. While the distribution of individual tanks, fire teams or troops is doctrinally resisted primarily for sustainment reasons, this does not address the reality that the demand will remain and the Sqn(-) / Half-Sqn may not provide a sufficiently flexible solution.

Dispersion in purpose requires the undertaking of "operations along a continuum that encompasses offensive, defensive and stability actions across the full spectrum of conflict from peacetime military engagement to major combat operations." It also contains the potential of simultaneous and varied operations which will be especially intense for the Recce Sqn SHQ. This enduring challenge also represents the flexibility sought by commanders from their Recce Sqns. For tanks, there needs to be a clear understanding of where in the spectrum tanks can be best employed as they are not optimized for all tasks. Such an acknowledgement is not a sign of defeat but rather an incentive to focus efforts where the best impact can be made.

Dispersion in terms of time also appears doctrinally familiar but there is a nuance. As outlined in ADO, dispersion in time involves "[de]centralizing tactical

decision making to well-trained and experienced leaders directly engaged in operations will allow us to control the tempo of tactical decision making. This will, in turn, allow us to disrupt the adversary's decision cycle at times and places of our choosing." The initial deductions of this approach reinforce our doctrinal understandings in mission command, the employment of initiative and being tactically decisive. The Armour Corps prides itself on the "mental agility" of its leaders at all levels and, in this regard, ADO offers some clear suggestions as to the challenges of the "human dimension." Situations faced will be complex and potentially new or novel demanding leaders who can quickly appreciate a situation and be decisive. While curiosity and creativity will certainly assist in the development of innovative solutions, risk-taking and therefore risk management will be critical to the execution of said solutions. It is therefore incumbent on the Corps to ensure that individual and collective training continues to address the "human dimensions" outlined in ADO in order to create leaders sufficiently adaptable to manage dispersion in terms of time.

Dispersion represents only one of a number of ADO considerations. While these considerations are not unfamiliar to the Corps, the points above demonstrate the amount of amplification required to transform a concept into tactical application. As the Canadian Army Land Warfare Centre (CALWC) embarks on the updating of ADO over the next few years, it is important that the Corps remain engaged to ensure that the new ADO concept is fully developed. In doing so, the Corps can ensure that it remains properly oriented in terms of its capabilities – people, process, training and equipment – for the future.



Zones d'opération
Source : B-GL-300-001/FP-002, Opérations terrestres, 1er janvier 2008.

INFLUENCING THE FIGHT WITH OTHER PEOPLE'S TANKS!

MAJ F.C.J. CONLIFFE

Global combat actions over the past decade have re-confirmed the value of armour on the battlefield provided that two conditions are met: local technological superiority and local superiority in training and doctrine. Western armour in Iraq and Afghanistan enjoyed both advantages. So did Ukrainian armour against partisans in the early stages of its ongoing war. Syrian Army armour in Syria's civil war has re-confirmed armour's vulnerabilities in complex terrain when unsupported by infantry and engineers. Ukrainian armoured forces suffered when facing technologically superior Russian tanks. In any conflict in the near future, Canadian armour will likely enjoy both advantages, but given the small size of Canada's tank fleet and even smaller size of supporting heavy engineering and CSS assets, we have to be realistic about the effect a Canadian expeditionary heavy force can achieve. It would be potent, but within a limited area and duration. However, there is another way to influence the armour battle: many nations we wish to support have fleets of tanks, but lack the doctrine and training to effectively employ them. Canada could increase its deployed presence and effectiveness through training regional armour forces.

Canada's formal security force capacity building (SFCB) doctrine, and existing ABCA doctrine, are both relatively immature and are mainly based on experiences developing light infantry forces. Draft Canadian doctrine states "for a foreign security force that does not already have sound institutional capability for personnel management in effect . . . all unit generation is based on the creation of basic, dismounted infantry units." But many potential allies do have the frameworks to permit training at a more advanced level. They simply lack the existing processes.

The nature of armoured vehicles precludes in-the-field mentoring. That leaves the logical location for mentoring in the training and doctrine system, influencing the physical and intellectual components of institutional power for security forces during the "generate" stage of security force capacity building. A model could be the Combat Team Commander's Course (CTCC) and the Squadron Sergeant-Major Course (SSMC), where tactical operation and combat service support is introduced at the combined arms level, which would mesh with analysis that the armies of friendly countries need to be "trained and organized to fight together not individually."

Draft Canadian doctrine recommends that SFCB operations respect unit integrity, suggesting that battalions and regiments form the basis of training teams. A training team based on an Armour Regiment Headquarters with two Sabre Squadrons, attached infantry, engineer, artillery and CSS sub-unit training teams would provide a solid basis for training local security force mechanized battle groups. Just as instructors at the CTCC and SSMC are Majors and Master Warrant Officers respectively, so too the sub-unit commanders and sergeants-major could perform the primary levels of instruction, with junior officers and Senior NCOs and WOs being available to provide tactical coaching at sub-sub-unit levels and lower. One observation from Op UNIFIER has been that Ukrainian AFV crew commanding needs improvement. Adding a gunnery cell and a technical intelligence cell would augment the utility of the training team in developing specific skills and assimilating intelligence useful to adjusting tactical employment in the specific environment.

Developing armour forces on SFCB operations is a currently under-used mechanism, but is one where the RCAC has great potential to influence the development of friendly nations. Moreover, it will achieve effects without less strain to equipment and personnel as deploying actual tank squadrons.

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STRENGTHENING THE RESERVES AND THE ARMOUR CORPS

MAJOR D.R. CRABBE AND MAJOR D.L. CHILDS,
CANADIAN ARMY HEADQUARTERS

The Chief of the Defence Staff's (CDS) vision for the Primary Reserves (PRes) is as "a predominantly part-time professional force, located in communities across Canada, ready with reasonable notice to contribute to operations at home and abroad." In support of this vision, he issued an initiating directive to the Canadian Armed Forces (CAF) in November 2015 outlining growth for the PRes by synchronizing the various PRes initiatives and setting a goal of 28,500 "average paid strength" (APS) by 2019. Understandably, the main effort is focused on recruiting and retention.

With the Canadian Army (CA) representing approximately seventy percent of the current PRes, the planning assumption is that CA APS will have to grow to approximately 20,000, several thousand more than the current level. Initial analysis also reveals a number of limiting factors related to the main effort of recruiting and retention. Canadian Forces Recruiting Group (CFRG) has finite capacity and growth will necessitate an improvement in the recruiting process, reinforcement of CFRG to increase capacity, prioritizing PRes recruiting or some combination of all the above. As no solution is likely to be brought into action quickly, initial growth will likely be limited. Closely following recruiting as a limiting factor is training. Pressure will start with recruit training within the Canadian Brigade Groups (CBGs) and at the unit level but will expand over time to include subsequent developmental period (DP) qualification at the training establishments and schools. Of note are the lessons related to Regular Force growth over the last decade. Over-fixation on recruiting led to significant numbers of personnel awaiting training at training establishments across the CA. Such backlog become a significant source of dissatisfaction for the recruits, encourages attrition and ultimately wastes finite recruiting capacity.

Retention will also need to be examined in detail in order to set the conditions to keep more trained personnel in service over time. In turn, some pressure will be reduced on recruiting and lower-level training. Ultimately, the goal is to create incentives and remove obstacles that affect retention. A key portion of retention will be the provision of more opportunities for the PRes, especially with respect to training and operations. This observation is reinforced by the steep decline in PRes strength observed post-Afghanistan where tours cease to exist as did a large number of Class B Regular Force backfills. Similar to the Regular Force, the PRes shares a desire to employ their skills operationally which will necessitate the provision of such opportunities as part of a comprehensive retention strategy. Leveraging technology such as simulation, access to equipment and a potential review of Professional Development (PD) training will also likely occur over the next couple of years.

Support to PRes growth in the CA will be dependent on investment in capabilities, equipment, people and infrastructure. The effects sought across the CA PRes must first be determined and therefore the distribution of investment in support of force generation goals. This can then be translated into occupation-specific and equipment investments essential to developing specific skills and capabilities. While procurement provides one equipment solution, so does redistribution, increased access or some form of combination of the three. Supporting growth will likely require an increase in personnel along a number of fronts: increase or re-distribution of Class BA in key positions; and increased Regular Force positions, especially within key support organizations; or Army Reserve units earmarked for significant growth. All these factors taken together will cumulatively define the infrastructure requirements. Initially this will likely result in unequal growth as initial investments will be focused on those units most capable of absorbing and sustaining growth.

Within the Armour Corps as a whole, the first challenge will be adopting a holistic approach to growth. Although recruiting will start growth its sustainment will be reliant on the entirety of Armour Reserve training, both individual and collective. While the requirement for the wholesale review of Armour Reserve individual training is uncertain, sustainment of growth will be dependent on the ability to develop Captains, Warrant Officers and Sergeants as

much as recruits: a difficulty that already exists with the high attrition and number of component transfers post-Afghanistan. Pressures on training delivery will likely result in demands for streamlined training, decentralized courses, training innovations or combinations of all the above. Equipment is a specific challenge for which there is no easy or timely solution. While the Tactical Armoured Patrol Vehicle (TAPV) provides an opportunity that is synchronized with force generation outputs, it is not accessible to all units. The natural reliance on the Light Utility Vehicle Wheeled (LUWV) or its replacement is logical but is neither timely nor particularly well defined. Affiliation therefore provides a more immediate effect where opportunities and geography permit. Taken together, the holistic approach will require examination of the issues over a prolonged period of time; the acknowledgement that growth will not be balanced initially and that pressure will have to be sustained to ensure that the Armour Reserve is properly resourced to achieve its role and any force generation targets.

Growth in the PRes – and the Armour Reserve – is most certainly welcome but will come at a cost that is still being determined. It is crucial moving forward that those involved appreciate the factors affecting growth both internal and external to the CA as well as the investment associated with growth over the next decade.

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ENHANCING THE UTILITY OF RESERVE ARMOURED RECCE

BY MAJOR C.W. HUNT AND WO P.R. FERNANDEZ

The King's Own Calgary Regiment aims to develop an integral all-terrain utility vehicle (UTV) capability to enhance its DOMOPS capability and general recce training in the near term. This initiative provides additional options for the RCAC and the Army to consider.

Bottom Line Up Front (BLUF)
Reserve recce units need an integral (in their armouries) mounted capability for two roles:

1. Generating recce patrols, troops, squadrons, for DOMOPS on short notice.

2. Providing a simple recce training platform in sufficient numbers with which to practice patrol and troop tactics locally.

Operational Requirements
Territorial Battle Groups (TBG) have deployed on domestic disaster response operations with both recce troops and squadrons within their ORBAT. The role of TBG recce is to increase the TBG Commander's awareness of, and ability to shape, the operational space, which may comprise fires, floods and storms.

Doctrinal recce tactics, techniques, and procedures (TTPs) are platform independent. However, training must focus on the crew skills and mounted reconnaissance tactics crewmen need to be successful on any platform. The G-Wagon is the primary reserve armoured recce platform; however, many units suffer G-Wagon shortages due to allocation, maintenance issues, or other training support requirements.

Specific requirements for both roles include:
Tactical mobility - Recce patrols must have superior tactical mobility in disaster response situations and be able to quickly traverse or bypass areas with damaged infrastructure, debris, or flood. Integral training platforms should have tactical mobility comparable to the TAPV so crews develop a true sense of how to employ their vehicle while conducting various drills in varied terrain.

Loading UTVs on a Trailer

They must also have some over-snow capability. This is not a distinctly arctic requirement. A platform that requires plowed roads or cannot go cross-country in more than 30cm of snow lacks the required tactical mobility. While snowmobiles possess that capability, they are 1-2 man vehicles that are difficult for operators to drive while conducting additional tasks such as navigation or radio communication. To date, our experience with various UTVs indicates a spectrum of capabilities. Basic UTVs, such as the Polaris Ranger, have cross-country mobility similar to a G-Wagon, while higher-end Polaris RZRs have cross-country mobility equal to, or greater than, a LAV!

Operational Mobility - Recce elements will be some of the first to deploy in support of disaster response operations and need the integral capability to deploy quickly and use highways over long distances. That distinct requirement for tactical and operational mobility means one or the other is often compromised when a single platform approach is used. Options analysis should consider multiple platforms (ie. MILCOT with trailer for operational mobility, pulling four-seat UTVs for tactical mobility). While not ideal, UTVs can travel highways when equipped with signal kits. The Canadian Armed Forces (CAF) can identify appropriate provincial measures to satisfy local highway safety requirements for operations, and in support of training.

Communications – Combat Net Radio (CNR), which are the preferable digital communications. Manpacks are a field-expedient solution but civilian radio systems compatible with First Responders may also be desirable and effective for disaster response operations.

Crew Capacity - Integral training platforms should have the capacity for four crew members: commander, driver, two dismountable scouts or a gunner and one dismountable scout. Four-person crews ensure that crew commander skills – the most essential skill set to be developed in training – such as communications, navigation, situational awareness, and crew control, are practised and preserved.

Protection and firepower – As these are not capabilities required for disaster response operations any Assistance to Law Enforcement Agencies (ALEA) DOMOPS should see TAPVs, once fielded, assigned for this task.

Summary - The vehicle is ultimately a delivery system for the soldiers crewing it. A highly mobile platform available in robust numbers will enable recce crewmen to effectively train and be employed in their role during disaster response operations.

Equipment Considerations

UTVs can be rented from local vendors, sometimes under standing offers, for reasonable rates. For a recent weekend exercise our unit was able to rent two UTVs and a trailer for approximately $1500. At those rates, a full troop of 8 vehicles could have been rented for approximately $6000. That price is still considerably less than the cost of deploying a mobile VBS lab to the Armoury for a weekend exercise. As such, UTV rentals are an affordable option when CAF UTVs are unavailable.

Polaris 900 with tracks

Why rent instead of buy? Units can rent vehicles using unit and formation operations & maintenance (O&M) funds, while major defence procurement is run out of Ottawa. That said, if units demonstrate they can generate/employ UTV capability, it makes the case for the Army to pursue an acquisition programme for reserve recce units.

In this fiscally-constrained environment, a UTV programme should be politically palatable. The G-Wagon purchase saw per-unit costs surpass $150,000. As this included projected operations and maintenance costs, the actual acquisition price was likely under $100,000. Today, a civilian pattern G-Wagon starts retail at $122,000. Commercial off-the-shelf (COTS) civilian four-seat UTVs start at $18,000. High-end, accessorized versions can be purchased for under $30,000, track-kits for less than $5,000.

For illustrative purposes, eight COTS UTVs for the 18 reserve recce units (144 total) acquired at a high-end price of $35,000 per vehicle would cost $5,040,000, $280,000 per Regiment. It's a simplistic example – if multi-year operations/maintenance costs are factored in, costs would increase by approximately $15,000 – but it offers context and proves substantially less expensive than the G-Wagon programme.

Some UTVs are purpose-built military variants. During February 2015, a CAF Appreciation night at a Toronto Maple Leafs game showcased CANSOF UTVs. Meanwhile, US SOFCOM announced the purchase of 2,000 Polaris MRZRs in March 2015, the US 82nd Airborne Division began trials on the MRZR-4s in April 2015 and militarized UTVs were submitted for competition in the U.S. Army's Ultra-Light Combat Vehicle (ULCV) program. In August 2015, Public Works and Government Services Canada released a Request for Information (RFI) from industry "on potential options to meet needs and associated capability, schedule and cost" for a ULCV for the CAF.

While militarized variants, complete with C-16 automatic grenade launchers, would be welcome in reserve recce units, procurement of civilian COTS UTVs is likely to be more timely, practical, cost-effective, and successful in navigating Canada's defence procurement process. As such, a practical, timely solution may be preferable to one that may deliver a superior solution sometime in the future. Furthermore, Canadian UTV manufacturers provide ample opportunities for 'regional economic benefits' through vehicle acquisition and ongoing maintenance, while qualifying army reserve maintainers on UTVs would equip them with marketable civilian skills.

Training

On Documentum, there is a three-mod Qualification Standard (QS) for ATV Operator. Mod 1 is mandatory for all ATV/UTV Operators. It is comprised of three training days and is conducted on 4x4 Quad ATVs. Mod 2 provides a generic qualification for all side-by-side UTV models. There is additional training required for use of track kits which is two days long and is not a pre-requisite for Mod 3. Mod 3 is for amphibious UTVs (Argos) and is three days long. These courses are easily incorporated into reserve timetables, for instance; Wednesday nights for theory and weekend exercises for practical portions.

Since September 2014, the Regiment has qualified 16 members to Mod 1, ten to Mod 2, and is investigating options for Mod 3 in 2016. Having a pool of qualified driver-examiners has been crucial to our ability to train internally. Initial rounds of 'train-the-trainer' were conducted by contracted civilian instructors, as well as qualified instructors from other units.

Conclusion

COTS UTVs are a viable low-cost option for reserve recce units to enhance both their DOMOPs capability in all seasons, as well as their ability to train at patrol and troop level locally. The King's Own Calgary Regiment is exploring this option aggressively and will continue to share lessons-learned. The training has been embraced by our soldiers, morale is high, and everyone is excited to innovate and generate new capabilities. This training is something other units can also easily pursue. The King's Own intends to continue informal trials using rented UTVs, in combination with G-Wagon patrols in a troop context and we recently submitted a Mobile Support Equipment Establishment Change Request for eight four-

seat UTVs. This is being reviewed further up in the chain of command.

The King's Own Calgary Regiment's experimentation with UTVs started as a grassroots response to lessons-learned from OP LENTUS (2013 Alberta floods), observations about our own vehicle shortfalls and the realization that there was opportunity to innovate using UTVs. Our initial experiences with COTS UTVs were extremely positive and demonstrated tremendous enhancement to our tactical mobility, flexibility, DOMOPS, and collective training capabilities. Recent developments with ULCV projects in the U.S. and Canada reinforce that UTVs can meet recce training and operations requirement. As these projects mature the Army should consider options for an appropriate mix of militarized and COTS UTVs to meet operational and training requirements especially for reserve recce units.

Onward!

RZR

ARMOURED BULLETIN CAVALRY ARTICLE – WHAT IS CANADIAN CAVALRY?

BY CAPTAIN J.W. RING, 2IC
A SQUADRON, ROYAL CANADIAN DRAGOONS

Captain Joseph Ring joined the Royal Canadian Dragoons in September 2008 and is currently the Second-in-Command of A Sqn, which has been training as a cavalry squadron since August 2015. A Sqn has been focusing on offensive operations with and without infantry support.

The RCD is currently undergoing a mentality shift from being a reconnaissance regiment to a cavalry regiment. It is agreed within the regiment that the term "cavalry" is more aggressive than reconnaissance and includes a larger span of tactical tasks. However, an accepted role of a Canadian cavalry regiment is not established in Canadian doctrine. In order to frame the discussion of a cavalry regiment in the Canadian Army, an accepted role of Canadian armoured cavalry must be adopted to ensure coherency across the RCAC. Once accepted, the employment and tasks of a cavalry regiment will be anchored to this role.

According to reference A, the UK role of an armoured cavalry regiment is based on a find, understand and exploit model. It acknowledges that an armoured cavalry regiment's primary task is, but not limited to, reconnaissance; it is capable of conducting the full complement of mission tasks, dependent on the OPFOR and terrain.

The Australian Army's role of cavalry is to locate, dislocate and disrupt the enemy through the conduct of offensive, defensive and security operations (reference B).

The American Army's role and purpose of the cavalry are well-articulated in reference C: "The fundamental purpose of cavalry is to perform reconnaissance and to provide security in close operations. In doing so, cavalry facilitates the corps or division commander's ability to maneuver divisions, brigades, and battalions and to concentrate superior combat power and apply it against the enemy at the decisive time and point. Cavalry clarifies, in part, the fog of battle."

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A. United Kingdom Armoured Cavalry Concept of Employment Version 2.0 Official 2015 Draft, dated 26 Feb 15

B. Official Australian Army Website. http://www.army.gov.au/Our-people/Corps/Armoured

C. Field Manual No. 17-95 Cavalry Operations dated 24 Dec 96

The Canadian Calvary Brigade waiting for inspection by King George V, November 1914. The RCD are in foreground.

In order to initiate the discussion of the role of a Canadian cavalry regiment, the following role is proposed:

The role of cavalry is to increase battlespace certainty in order to exploit the enemy's vulnerabilities and reinforce friendly forces' successes.

Battlespace certainty is increased by a cavalry force in two distinct ways:

1. Providing the commander with timely and relevant information, i.e. reconnaissance.
2. Conducting enabling operations that provide the commander with freedom of action. For example, a cavalry unit can conduct an isolate task that will allow another unit to fight an unimpeded battle elsewhere. The cavalry's isolate task provides the commander with certainty; he is now more certain that the OPFOR will not be able to reinforce one another.

A cavalry regiment decreases the unknowns of the battlespace by fighting for information and immediately acting upon it. Such a force understands the importance of seizing the initiative in order to reinforce success. It is in direct support of the commander's decisive battle, ensuring the commander's freedom of action is maintained while denying the same to the enemy. It is inherently flexible, capable of either conducting direct action against the OPFOR or enabling the direct actions of friendly forces.

In conclusion, an accepted role of a Canadian cavalry regiment must be adopted. This role will serve as the thesis to this type of unit and will guide further development of the concept. Our allies have established roles for their cavalry forces that can begin our discussion and help the RCAC develop its Canadian-specific definition.

With a baseline understanding of the role of a cavalry regiment, the tasks, employment, and planning considerations of a cavalry regiment can be explored. For the purposes of framing the following discussion, a cavalry regiment, not a cavalry battle group, will be examined.

In the context of a CMBG, a cavalry regiment would be given tasks that enable the preservation of the commander's main effort. Along this vein, a cavalry regiment would not likely be the brigade's main effort during the decisive battle because that falls into the realm of infantry and tank forces. That is not to say, however, that a cavalry regiment would not be the main effort of a particular phase of an operation. Specifically, the following tactical tasks would likely be given to a cavalry regiment within a CMBG:

Guard: During both the offense and defence, a cavalry regiment would be given a guard task to ensure that the brigade's main force is protected while intelligence is gathered.

Fix/Isolate/Interdict: Used during the offense, a cavalry regiment would be a given a fix, isolate, or interdict task to ensure that the OPFOR is unable to reinforce its positions or manoeuvre to a position where it is able to gain an advantage against the friendly forces. When a cavalry regiment is given these tasks, the commander's freedom of manoeuvre is maintained.

Pursue: Used during the offense, a cavalry regiment would conduct a pursuit to quickly destroy an escaping OPFOR. Because of the forward nature of a cavalry regiment, time and space considerations would likely determine that a cavalry regiment is best suited for this task rather than an in-depth battle group.

Delay: Used during the defence, a cavalry regiment would conduct a delay to enable the brigade to prepare the main defensive area. The delay constraint would likely be to destroy the enemy reconnaissance and mechanized vanguard elements, which would force the early commitment of enemy armour.

With a framework to describe the role and tasks of a cavalry regiment established, the remainder of this article will discuss the planning considerations that were developed from Exercise ANALYTICAL DRAGOON, a week-long cavalry professional development exercise that the RCD executed in April 2015, as they relate to the combat estimate:

Mission Analysis: The aggressiveness of the cavalry regiment's manoeuvre will be established from here. The trade-off between speed and security will be established and the level of risk that the higher commander will accept will be identified. In addition, the higher commander's main effort must be well-understood in order for the cavalry commander to ensure that his commander's main effort is supported through the cavalry's actions.

Environment: The environment will assist in establishing the cavalry regiment's level of dispersion and priority of reconnaissance. The nature of the population may also

A Cavalry Regiment in a Canadian Mechanized Brigade Group

require the cavalry regiment to integrate other specialists such as CIMIC and PSYOPS forces.

Enemy: The strength of the enemy will determine the types of action that the cavalry regiment will conduct. If the enemy can be destroyed within the cavalry regiment's means, then this COA should be taken in order to maintain momentum. However, at times it may be more appropriate for the cavalry regiment to handover a contact to a friendly force. The cavalry regiment must remain flexible and capable of conducting both reconnaissance and direct action as the battlespace is defined.

Own Forces: Although contrary to convention in that reconnaissance forces are not kept in reserve, a cavalry reserve should be established if the cavalry regiment is taking direct action against an enemy. In addition, a cavalry regiment is able to be a battle group and should be resourced as such if it given tasks related to the retention of terrain. It must be skilled at integrating and employing other arms in order to achieve the commander's intent. When employing these other arms, the centralization or decentralization of these resources must be considered, as well as their special sustainment considerations.

Surprise and Force Protection: The HQ Sqn, lines of communication and signals elements (such as RRBs) may require a force protection element. There will inevitably be a friction between dedicating resources to force protection and dedicating resources to accomplish assigned tasks. The terrain and enemy are also factors in deciding where to allocate resources. A potential solution to this friction is maintaining a dedicated combat support squadron (cbt sp sqn) that will conduct all force protection tasks. Additional tasks for a cbt sp sqn are to provide a regimental reconnaissance force which could enable early warning.

Time and Space: In the context of 2 CMBG, which has not conducted operations or training with a cavalry regiment, time and space needs careful consideration. The brigade will be able to operate at a quicker pace because it has more combat power in front of it, assuming a cavalry regiment, not a squadron, is operating in front of the brigade. On another note, the frontage of a cavalry regiment is not well-established in a Canadian context. Does it advance with two cavalry squadrons up and one in depth? The depth of a cavalry regiment needs to be explored further in order to provide a brigade-wide understanding of its employment.

A cavalry working group should be hosted by the RCACS with a view of developing the established role and tasks of a Canadian cavalry regiment. This working group should include participation from the key Canadian stake holders and allied forces. Once the RCACS has set the framework for the way ahead, planning considerations of a cavalry regiment must be developed within a CMBG context so that it is employed to its maximum potential.

NOT JUST SNEAK AND PEEK

CAPT D.J. GRANT

On October 29, 2003, Defense Minister John McCallum and Canadian Army Commander Lieutenant General Rick Hillier announced the retirement of the Canadian Army's Leopard 1 tank fleet. Subsequent fighting in Afghanistan, particularly the 2006 battle for the "White Schoolhouse" during OP MEDUSA, demonstrated that tanks still had a place on the modern battlefield. New Leopard 2 tanks were hurriedly sourced in 2007 and tanks were restored to the Royal Canadian Armoured Corps' Order of Battle.

In the interim period between the retirement and subsequent restoration of the tank the Royal Canadian Armored Corps (RCAC) School reoriented its training solely towards reconnaissance. Prior to 2003 basic crewman and officer training had been primarily tank-centric with only a subset of specialists receiving more advanced training in reconnaissance tactics.

With the tanks gone, reconnaissance became the focus and that focus remained - notwithstanding the return of tanks to the corps - right through 2015. Somewhere along the way the doctrinal concept of "avoid decisive engagement" became implanted in the Corps' collective psyche as a meme (and eventually doctrine) stating that "reconnaissance doesn't fight at all." By embracing this myth the RCAC ignored not just numerous counter-examples of reconnaissance troops successfully fighting but examples from its own history of highly successful fighting missions carried out by reconnaissance soldiers similarly equipped to modern reconnaissance troopers.

This article seeks to refute the "recce doesn't fight" myth by providing an historical example of fighting scouts drawn from RCAC history. This example will conclusively demonstrate that teaching reconnaissance soldiers that they "must never fight" denies the Canadian Army an important capability and flies in the face of Corps history. The Italian Campaign of WW2 was conceived as a strike into the "soft underbelly of Europe" with the strategic goals of knocking Italy out of the war and drawing as many German troops as possible from the Eastern Front and the upcoming defence of Normandy. The invasion of the Italian peninsula started well but Hitler decided that Germany was best defended as far away from Germany proper as possible and ordered the construction of a series of fortified lines to halt the Allied advance.

The spine of central Italy confines operations northward to the plains along the coasts. These plains are periodically cut by rivers that flow down from the highlands to the sea. The exception is the Liri River, which parallels the coast, and whose valley provides a natural avenue northward. The exit to this valley is in turn blocked by a tributary of the Liri, the Melfa, which flows down from the highlands to merge with the Liri.

The entrance to the valley was guarded by a defensive line known as the Gustav Line. Ten miles beyond it was the main defensive line, the Adolf Hitler Line. A final (unnamed) defensive line was established on the far bank of the Melfa River as the final cork in the Liri Valley bottle. A breakout to Rome was going to require breaching all three lines. A well-executed defence along any one of these lines was capable of firmly stalling the allied advance.

The 1st Canadian Corps, commanded by Lieutenant General Tommy Burns, had been committed to breaching the Liri Valley defenses. As the main obstacle to forward progress punching through the lines and resuming the advance was of utmost importance. The only way through would be to breach the Gustav and Hitler Lines and ultimately force a crossing of the Melfa and push an armoured wedge through the breach.

The Gustav Line broke on 13 May 1944. The Hitler Line was forced via a costly frontal assault on 23 May. All that remained to hold the Canadian troops back was the crossing of the Melfa.

An estimate of potential crossing sites was made. The obvious site was sure to be heavily defended but an aerial reconnaissance revealed a smaller site, slightly to the south, that might be less well protected. The Lord Strathcona's Horse (LdSH) armoured regiment was tasked to assault the southern crossing site and establish a bridgehead for follow-on forces.

The LdSH consisted of four squadrons of Sherman

tanks and their recce troop. Commanded by Lt. Edward J. Perkins, the recce troop was composed of eleven "Stuart Honey" light tanks. As it had been discovered in Africa that the 37mm gun in the Stuart was ineffective against German armour, the turrets had been removed to make the tanks lighter and faster. Now effectively APCs, the Honeys were armed with a .50 calibre machine gun, small arms, and a few PIAT anti-tank grenade launchers.

Perkins was tasked to screen the Regiment to the crossing site, seize the crossing itself, and hold it until the rest of the Regiment arrived in force. As the condition of the ford was unknown Perkins was provided with a troop of engineers to help assess and improve the ford. Because these engineers did not come with integral transport six of Perkins' Honeys were emptied of Armoured troopers and instead filled with engineers. With the majority of his tanks now employed as taxis Perkins was down to only three manoeuvre elements (two 2-car patrols, and his own car).

The start line for his advance was four kilometers from the ford. At H hour his troop crossed the line of departure and Perkins' own Honey immediately broke down. He commandeered one of the other vehicles in his troop and now he was down to four effective fighting vehicles.

The advance resumed. En route his troop encountered a Panther tank (the first ever encountered by Canadians) and Perkins engaged it with machine gun fire. The commander, who had been exposed in his hatch, was hit and killed and the Panther hurriedly retreated.

Arriving at the ford site the engineers quickly built a ramp and retaining wall and Perkins crossed the river with his four Honeys. Dismounting, he kicked down the door of a small house that overlooked the crossing and found it occupied by German soldiers – who he single-handedly convinced to surrender to him.

With the crossing site secured he organized a hasty defensive perimeter and awaited the rest of the Regiment. Unfortunately, the Regiment's advance was not proceeding smoothly. The Panther that Perkins had encountered earlier proved to be part of a much larger force tasked with defending the near side of the river. A massive tank-on-tank engagement had erupted as the Strathconas dealt with the unexpected enemy.

Perkins' little force hung on for dear life repelling a series of counterattacks. Eventually he was joined by an understrength infantry company from the Westminster Regiment who dug in and thickened his perimeter. Outranked by the company commander Perkins yielded overall command to the infantry but continued to fight his force cleverly moving his turretless vehicles around so that the engine noises made it sound like there were gun tanks in the bridgehead. The Germans continued to mount piecemeal counterattacks but never decisively committed their full force apparently convinced that the bridgehead force was larger and better armed than it actually was.

After nearly 24 hours of fighting the remnants of the LdSH made the crossing, widened the breach, and the breakout was on. With their final defensive line pierced the Germans pulled out and started retreating. The crossing of the Melfa River, as the final action of the Liri Valley campaign, restored forward movement and prevented the Italian Campaign from bogging down.

Perkins' action on the Melfa is instructive to the modern recce commander because his force was entirely comparable to modern armoured recce forces. Perkins' Honeys were not materially different from more modern vehicles such as Lynx (indeed, a Lynx is arguably a purpose-built Honey) and were inferior, both in terms of protection and firepower, to the Coyote. His tactics were no different from anything taught by the modern Armoured Corps save that he was explicitly tasked to fight (the modern NATO mission verb would be "seize") which per current doctrine is not an appropriate recce task. This was not a target of opportunity; - a subordinate making an assessment on the ground and then acting without specific orders - this was a planned operation that does not appear to have been considered in any way extraordinary. The leadership of the LdSH did not have any problem (personal or doctrinal) assigning Perkins a fighting task and committing him to a "decisive engagement" and their faith was rewarded with a successful crossing and its subsequent strategic consequences.

It should also be noted that tasking Lt. Perkins to fight was not a one-off rarity but appears to have been standard practice. Perkins' action was unusual in that it had a clearly defined sense of operational success, but the official histories are full of examples of recce troops fighting.

Other historical examples abound. On 1 July 1863 Brigadier General John Buford, the cavalry commander screening the advance of the Union Army, encountered the vanguard of General Robert E. Lee's Army of Northern Virginia near Gettysburg, Pennsylvania. Realizing simultaneously that Lee's army was blind (General Stewart's cavalry force was elsewhere) and that he had just traversed ideal defensive ground Gen. Buford represented his troopers as infantry in order to force Lee's army to deploy in the low ground. The deception worked; the following Union troops deployed on the high ground and as a direct effect of holding the positional advantage afforded by the terrain the Union won the Battle of Gettysburg.

On 26 Feb 1991, during the First Gulf War, the American 2nd ACR who were tasked with screening the advance of VII Corps unexpectedly encountered the Iraqi 18th Mechanized Brigade and 37th Armoured Brigade during a sandstorm and destroyed both units while taking minimal casualties.

"Sneak and peek" is certainly viable doctrine, but there is a time and place for everything. Recce soldiers can fight, are equipped to fight, and when the time is right, must fight. They might just win your war for you!

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HEADQUARTERS SQUADRON - REINVENTING THE WHEEL

CAPTAIN S.G. COUTURE

2015 provided Lord Strathcona's Horse (Royal Canadians) Headquarters Squadron (HQ Sqn) with many opportunities and the challenges that went along with them. For the first time since 1997, HQ Sqn was tasked with supporting the Regiment while it force generated a Battle Group. Throughout the last couple of decades, HQ Sqn has been employed as a stationary element. Whenever the Regiment would deploy to the Wainwright Training Area, HQ Sqn would establish a large spread out camp in Peregrine 9. From this location HQ Sqn would provide the Combat Service Support (CSS) necessary for Regimental operations. This year was much different. Our mandate was to develop a mobile, tactical, and responsive HQ Sqn, capable of supporting a Battle Group in operations. In order to achieve this, we delved into our doctrine to re-learn our conventional role.

Ex MAPLE RESOLVE in the spring of 2015 gave HQ Sqn its first chance to provide CSS to a Battle Group sized element. The Regiment was tasked with fielding the OPFOR (Opposing Force) Battle Group for the exercises. This Battle Group consisted of almost 600 soldiers, and HQ Sqn supported their operations throughout. Despite being employed in a largely static role on this exercise, HQ Sqn started learning the finer details of supporting these multiple combat elements concurrently, as they conducted a wide variety of tactical operations.

After the conclusion of Ex MAPLE RESOLVE 2015, it became HQ Sqn's priority to develop the capability of providing support in contemporary operations. This includes being mobile and providing its own force protection. Unfortunately, over the last 20 years or so, the Regiment has employed HQ Sqn in a much more comfortable, static role. Taking on the challenge of developing our lost skillsets proved to be a formidable task. In order to be capable of advancing throughout the battlespace, we had to divide our Command Post into two elements: a Forward CP and a Rear CP. On Ex STEELE SABRE 2015, no matter where we were, we were operating tactically and we maximized the use of camouflage and concealment. Each element of HQ Sqn faced its own challenges in re-learning this skillset. While operating in any forward locations, we had to develop the ability to tactically conduct maintenance, resupply and provide medical support to the Battle Group. Transport Troop's MCpl Frank Brown speaks to some of the changes he's observed: "Headquarters Squadron is now a mobile tactical force able to occupy and operate in its own hides. Transport is responsible for assisting in security within the hides, manning Observation Points as well as our normal resupply operations. Transport now will launch from within a hide and manoeuvre throughout the training area as a tactical convoy to establish delivery points. With our new found ability to operate as a forward tactical force, Transport has found itself to be able to respond more quickly to the Battle Group's requirements of both routine and emergency resupply needs".

Captain Darren Carter-Wright emphasizes some of the improvements we made by having a more mobile HQ Sqn: "Having HQ Sqn deployed forward allowed much more agile CSS for the Battle Group. Maintenance Troop's forward element provided an essential link between the fighting troops and the Brigade Support Area. Their forward presence allowed for more rapid repairs and recoveries of downed vehicles. In addition, having the Unit Medical Section deployed forward gave HQ Sqn the ability to assess and treat casualties faster". Through the implementation of these changes, we now have the capability to more effectively support a Battle Group in conventional operations.

Not only are we operating in much more austere conditions, but we also took on the challenge of digitalization. Modern technology adds many benefits to our CSS operations. Using computers as our primary means of communication as opposed to purely using CNR, allows us to more effectively communicate the large amount of information

that our higher headquarters and Logistics Operations require. The issue with this technology is effectively utilizing it on the conventional battlefield. Captain Pat Theroux, the Maintenance Officer provides one example we faced while integrating modern technology in austere conditions: "The Defence Resource Management Information System (DRMIS) is an all-encompassing system that is affecting how Maintenance and Supply is conducted in the modern military. Maintainers rely on this system to raise work orders, order parts, account for their time and look up repair manuals. All of this and more can be done and it only requires one thing, a computer with connectivity to DWAN. So the question is how can all of this occur when a unit is deployed on exercise and is expected to be mobile and not connected to DWAN? On Ex STEELE SABRE 2015 we went back to the basics, utilizing paper reporting systems not normally used when in a garrison environment. While this could result in some delays, it proves that until such a time that DRMIS becomes truly mobile, there are still options for Maintenance Troop to continue to successfully support the Regiment in austere conditions."

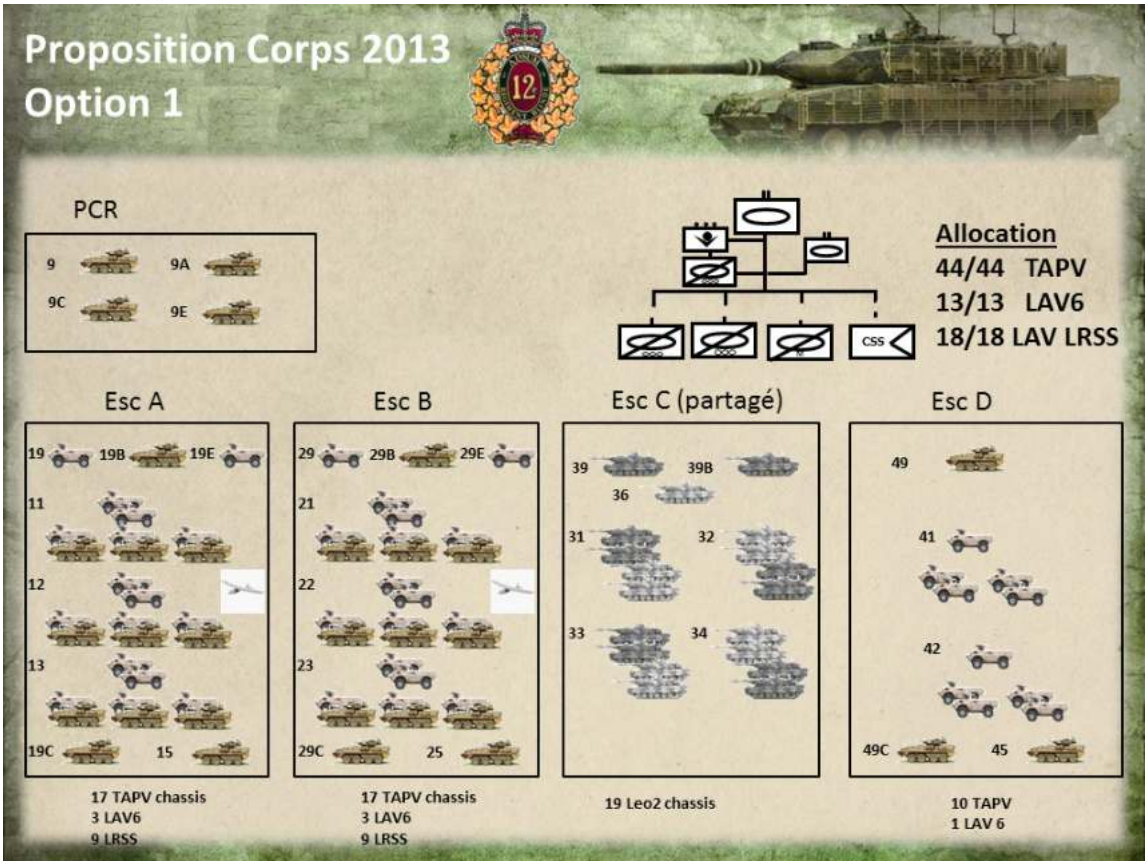
As we move forward into Maple Resolve 2016 and beyond, we are excited to implement our new system of Standard Operating Procedures as well as our re-developed TTPs. Through rebuilding our foundation from tried and true doctrine and integrating state of the art modern technology, we are creating a Battle Group Combat Service Support element the likes of which the Strathconas' have never seen before. Our aim is to set the standard for future generations of HQ Sqn and ensure that our lessons learned are passed down so that our successors never have to "reinvent the wheel".

INTERGRATION OF THE TAPV AND LRSS

MAJ J.M. ARSENAULT

With the upcoming fielding of the TAPV and LAV LRSS, much speculation is currently ongoing with regards to the composition of Regiments employing reconnaissance squadrons and tactics, techniques and procedures (TTPs) that they are to employ. This essay wishes to introduce a different approach from what was previously produced within the Royal Canadian Armour Corps (RCAC). Until now, the Corps has presented a hybrid fleet type-structure based on 44 TAPVs, 13 LAV 6.0 and 18 LAV LRSS. Table 1 depicts the Corps's vision for both the RCD and 12e RBC. The proposed ORBAT is composed of two robust reconnaissance squadrons composed of three troops of eight vehicles, each troop composed of three mixed patrols. With the exception of a shared tank squadron, the third squadron would be reduced to two troops of five TAPVs.

I would like to propose a different approach which would allow for more employment flexibility, along with an increased capability to act as a reconnaissance element, as opposed to a medium armoured platform. It is important to note that our proposition does not bring any requirements for personnel augmentation. It, however, accounts for the Tube-launched, Optically tracked, Wire-guided anti-tank missile/Improved Target Acquisition System (TOW/ITAS) that could eventually be re-attributed to the Royal Canadian Armour Corps. Table 2 illustrates our proposition. We propose the formation of two medium armoured squadrons composed of two troops of four TAPVs and two troops of four LAV LRSS. By employing sabre-type TTPs, these squadrons would be in position to address a much wider spectrum of tasks. The shared tank squadron would be maintained. The third squadron, located within the Regiment, would be formed of two TAPV troops and one LRSS troop, each composed of two patrols and six vehicles and employed as the brigade's reconnaissance squadron.

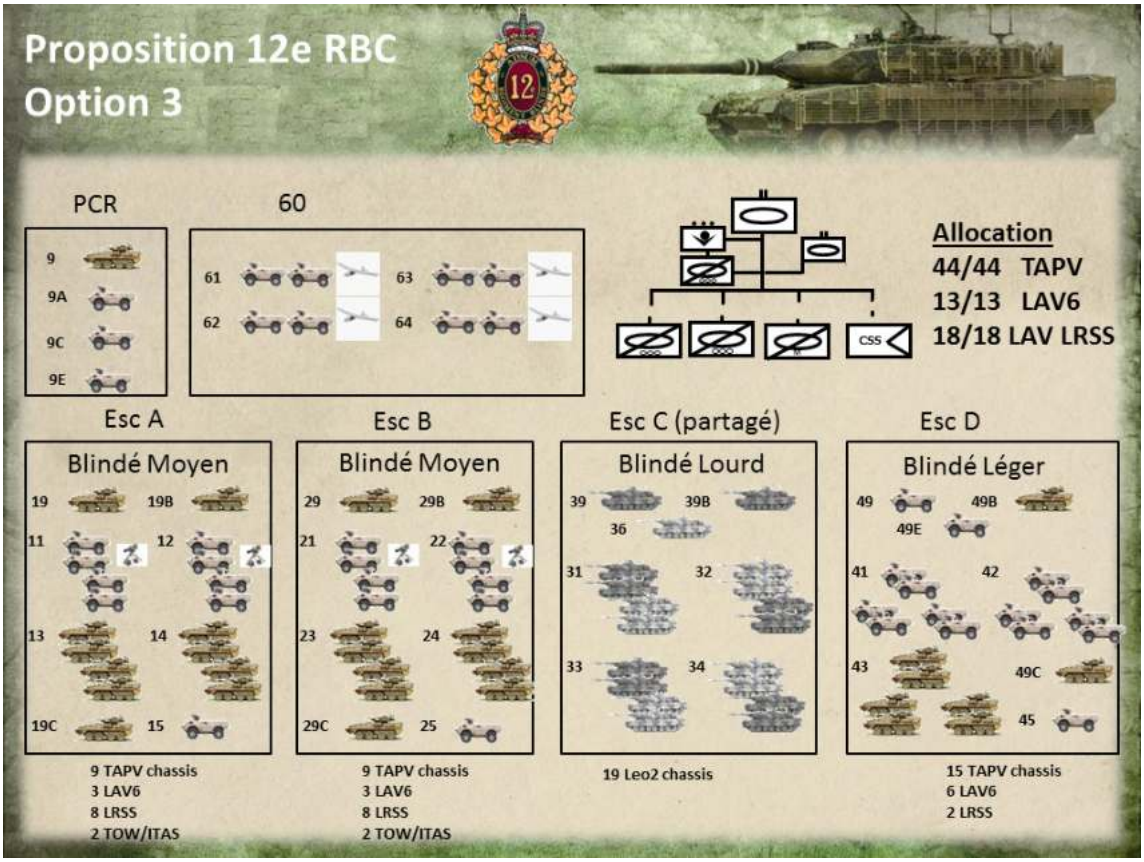


Corps 2013 Proposition

This formula, composed of two medium armoured squadrons and one light armoured squadron, would allow more training versatility for our members in addition to maintaining a high level of professionalism on sabre and reconnaissance tactics. It gives a raison d'être to the Regimental Headquarters (RHQ), which plans in being an organisation capable in commanding a battlegroup as opposed to be a simple force generator.

This approach, with troops reduced to four vehicles per troop, adds a fourth troop to A and B squadrons in addition to enabling D squadron to possess three troops of six vehicles allowing it to continue to act as the brigade reconnaissance asset with sufficient robustness. In turn, this sufficient robustness justifies its pertinence. As for A and B squadron, they would now be in position to be employed as reconnaissance troops, as well as conducting intermediate sabre tasks. This concept of employment formula would allow the Corps to maintain a high level of armoured doctrine and TTPs knowledge and would considerably increase our flexibility and employability. As well, the integral incorporation of the TOW/ITAS in each squadron would allow for an anti-tank capability that is otherwise absent within our organisation. Finally, the addition of a 60 troop, equipped with UAVs, would also add to our detection capability and bring several additional options when comes the time to conduct certain complex tasks at the regimental level.

12e RBC having been designated to conduct the TAPV TTP Tactical Evaluation in October 2016, it is the intent of the Cmdt to proceed with a comparative assessment between both the Corps's and the Regiment's propositions with a view to identify advantages and disadvantages for each options in any given tasks. By employing the complete set of BTS that we must comply to, as much on the reconnaissance than on the sabre side, the Cmdt wishes to trial both proposition in order to determine which one offers for more flexibility, security and tactical advantages. Finally, upon the completion of the TAPV TTP Tactical Evaluation, the Cmdt aims to submit his complete observations/deductions to the RCAC to allow for an informed decision on the future composition of our forces and their corresponding doctrine.



12e RBC's Proposition

ARMOURED CORPS RESERVE - INTO THE 21ST CENTURY

LIEUTENANT-COLONEL M.A. ROSTEK, CD,
PHD COMMANDING OFFICER, THE ONTARIO REGIMENT (RCAC)

Introduction

Over the last 400 years, the Reserves have played a significant role in meeting Canada's security needs. Deployments included domestic and international operations, but most notably the value of the Reserves was demonstrated during the two world wars. More recently, the Reserves have contributed upwards of 20 percent of manning requirements for CF operational deployments. In fact, Army Reservists are now forming dedicated sub-unit organizations to current operations. It is quite safe to say that in today's security environment, the Government of Canada have come to rely more heavily on the Reserves as they continue to make up a integral component of the Canadian Armed Forces (CAF) in a part time role.

Future Security Environment

The early 21st century has been witness to the development of an international environment marked by considerable uncertainty, volatility and increasingly rapid change. Old familiar "rules of the road" have faded, new ones are beginning to emerge, and events are unfolding at an accelerating pace. Attempts to understand and if possible, anticipate future challenges are essential for effective security planning. In particular, several trends reveal important aspects about our future.

Canada's labour force is changing and this has direct impact on the Army. In the near future, the Army will be comprised of multi-generational groupings each with a distinct culture and set of values. The children of baby boomers will make up the bulk of the recruitable cohort for the Army and they have been shown to demonstrate non-traditional attitudes towards work ethics, hierarchical institutions and career loyalties. Not only is this cohort increasingly educated, they are increasingly female. Therefore, it is essential that approaches to future recruitment attempt to bridge these generational differences.

An aging population coupled with lower fertility rates in Canada conspire to create an unprecedented demographic situation in Canada. The declining youth population in the traditional recruitable cohort will translate into declining enrolment for the Army. Further, population growth in Canada is currently sustained through immigration and this population sector contains much of Canada's skilled labour. The bulk of immigrants settle in closely-knit communities resident primarily in urban areas. In fact, a more detailed systematic assessment of Canada's environment reveals that urbanization "…will be one of the most significant dynamics affecting the future, presenting both opportunities and risks."

Urbanization is well advanced within Canada. Today, more that 81 percent of Canadians live in urbanized areas. Further, approximately two-thirds of Canada's population growth is derived from immigration (migratory increases) and indeed, this is considered a Canadian megatrend. Statistics Canada projection reveals that:

…immigration will not only continue to be a key driver of population growth in the coming years—without it, Canada's population growth could be close to zero in 20 years, as the population continues to age and fertility rates projected to remain below the replacement level of 2.1 children per woman.

If the Army is to retain its legitimacy with Canadian society, it must take account of this shifting Canadian demographic that is increasingly urban and Asian.

The traditional recruitment and retention paradigms are also changing. In the future, the Army will be recruiting from a dwindling skilled labour pool that will be equally targeted by other employment sectors. This smaller population base of young adults coupled with non-traditional attitudes will be in high demand across all economic sectors thereby creating a new recruitment dilemma for the Army. This is contrasted with advances in technology allowing Canadian to live longer and healthier lives thereby allowing for an increased productive life span. As such, the Army must explore new recruitment and retention approaches to remain effective in the future

environment - a future environment that will increasingly demand a higher standard of professionalism and dedication from its citizen soldiers.

As these demographic and urban trends increasingly intersect over the next decade, it will become more difficult to recruit members for the Army. This in turn will necessitate the requirement for a more forward-looking review of legislation, policies, and compensation in order to attract the best and brightest to the profession of arms. One approach to this force generation problem involves a re-assessment of the traditional Reserve Force model where Reserves are viewed as augmentation mechanism for the Regular Force. We must encourage debate and inquiry concerning this model if we are to mitigate the worst effects of the above mentioned trends in order to maintain a credible Reserve capability into the future.

The Armoured Corps Reserve have a long and proud history within Canada. While we must never forsake their historical roots, the trends described above signal both the promise and peril of their future. Equally, the enormity of the change and challenge before the Armoured Corps Reserve should not be underestimated as rapid change in physical, legal, social, political and science and technology realms often create non-linear events and trajectories which affect Armies around the world. The Canadian Armoured Corps Reserve is not immune to these global perturbations. However, it remains the dedicated citizen soldiers who lead and care for the Reserve units, in partnership with the employers and their respective communities, which anchor unshakable foundations; foundations that provide a "foot on the ground" from which alternative futures for the Armoured Corps Reserve can be explored.

MANAGING EDITOR'S REJOINDER – A NOTE ON DOCTRINE

BY MAJ T.I. DOSSEV.
OC STDS SQN, RCACS

As this issue of the Armoured Bulletin demonstrates, there is no shortage of challenges for our Corps. Most urgent is the imminent fielding of new equipment with the TAPV and the LAV LRSS, divestment of the Coyote, combined with the reinvigoration by the CA of the TOW with the Infantry and, in the not so distant future, the PSS with our PRes. But we all know that we are not defined by our equipment. Unlike the navy and airforce who man their equipment, we equip our men. If the equipment is not what defines us, then it must be our soldiers who do – so we must describe how our soldiers and officers think. We must describe our unique culture. To that end, as some of our readers may know, we have undertaken to rewrite our highest level doctrine – the Armoured Regiment in Battle (ARiB), with the small first step being a Doctrine Note (DN), *Armour in Operations*, to outline the way ahead.

The small team which drafted this note consisted of selected members of all regular force regiments and represented our reserve component as well, comprising experienced NCOs and Officers of mixed backgrounds. The short DN is only about twenty pages long in three chapters and, by the time it goes to print, will likely be shorter. The key concepts are as follows:

a. Retain the concept of Armour to be all-encompassing of the trade and nature of mounted units. The exact role was reviewed and revised while the three weight model (heavy, medium, light) was abandoned as it is relative to currently equipped platforms in favour of an Armour Generalist approach.

b. Sub-units may be optimized in terms of structure and equipment for armoured or armoured reconnaissance tasks, though they are capable of operating across the spectrum of tasks dependent on the environment and the adversary.

c. Rename Tank Sqns to Sabre. They may be assigned offensive and defensive tasks, even if they are not necessarily equipped with tanks. Sabre Sqns are organized and trained to perform those tasks normally assigned to a Tank Sqn.

d. Armd Recce Sqns can – and should – fight for information and conduct counter-reconnaissance. These tasks will naturally be weighed against the reduction in ground sensors and the capabilities of the adversary.

The first chapter will describe our role, tasks and characteristics, as well as some fundamentals of employment. To anyone who has read both the 1990 ARiB and GMR, these will be quite familiar. The key difference here is that we have attempted to describe features which are common to both our reconnaissance- and tank-based roots. As a result, a number of common core competencies emerged and were defined within the framework of the offensive, defensive, enabling, and stability operations to be attack, defend, RAPZ and Screen.

The second chapter aims to describe our essential qualities and our unique culture. What we propose are awareness, aggressiveness, resilience, agility, character, adaptation, and equipment proficiency and husbandry. I encourage you to consider which qualities differentiate the Armoured officer or soldier from all other combat arms.

The final chapter deals with organization and force employment. The challenge for the organization is to describe an Armoured Regiment with many squadrons when we know that they are not all equipped with tanks. The language of the Sabre Squadron, or as the 12e would say, *Escadron de Chasse* (Hunting Squadron), is what allows us to define a mounted force which fights from its mounts, though it is not necessarily equipped with tanks. As a result, we defined two types of Squadron optimized in organization and equipment for either Recce or Sabre based on their suite of tasks, rather than a task (recce)

and a platform (tank). I encourage you to adopt this language and deliberately refer to our Leopard 2 equipped squadrons as Sabre (or Chasse), rather than Tank because we may soon have more than one Sabre Squadron per regiment, even if they do not have tanks.

A final section on force employment is essentially a list of tasks taken from Land Ops, ARiB, GMR and the Reconnaissance Squadron in Battle (dated 1979). The tasks are intended to be permissive, and allow an armoured force, even if equipped with the lightest jeeps, to conceive of itself as capable of fighting depending on the enemy, terrain, and task. Conversely, a Sabre Squadron equipped with tanks may find itself operating more tentatively and performing find, fix, and exploit tasks based on the terrain and enemy. The character, aggressiveness and mental agility of the Armoured soldiers, NCOs and officers is the most significant factor in defining how an armoured force may be employed.

I am exceedingly encouraged by the intellectual engagement of our Corps with the issues of today as evidenced by the sizeable Doctrine and Structure section of the current issue. By getting the doctrine right we will ultimately influence our army leadership, our acquisition and capability development process, our structures, and our training system. Doctrine forms our foundation and we have taken the first step in re-establishing it in over two decades.

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