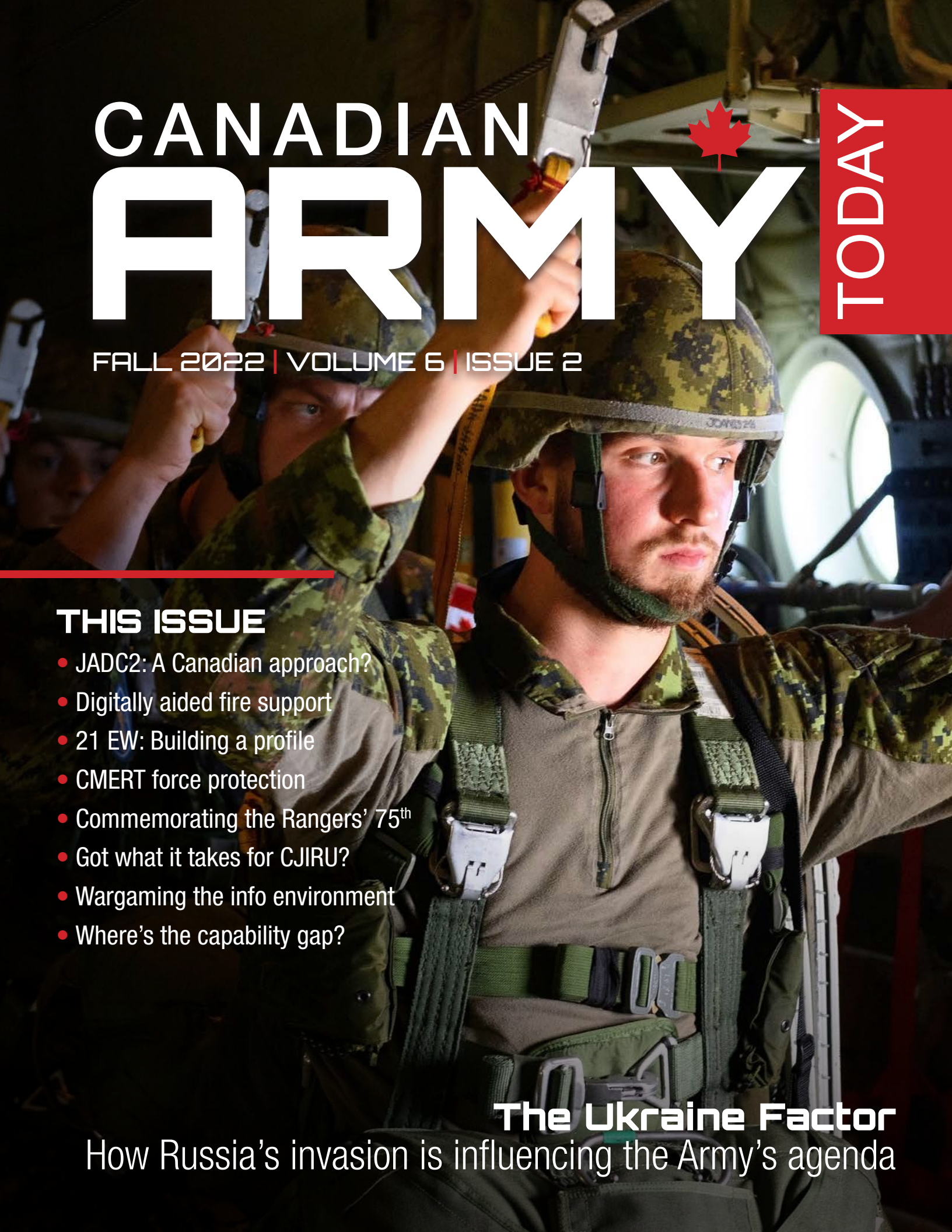

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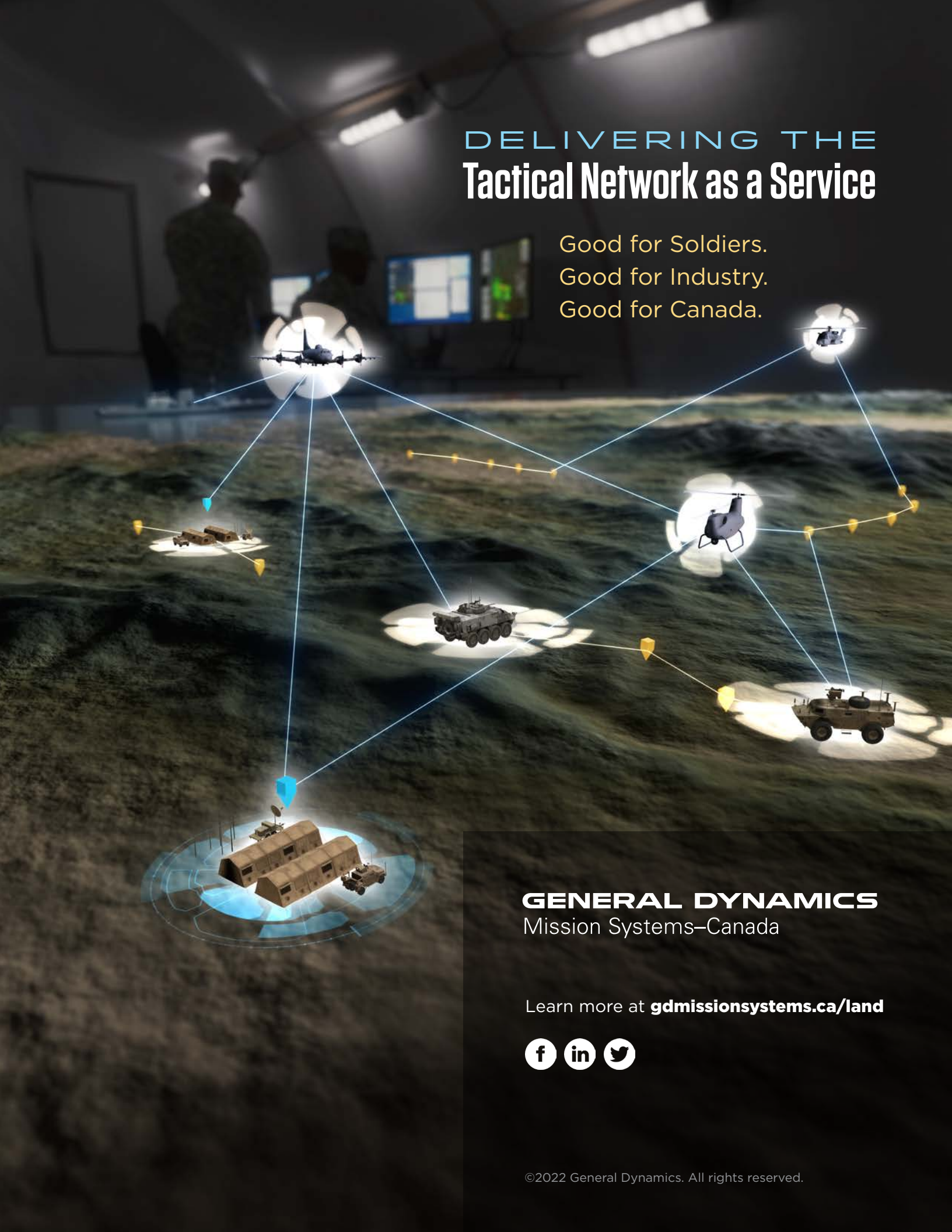

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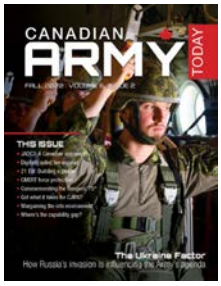

On the Cover:
Members of the 3rd Battalion, Royal 22e Régiment prepare to parachute jump during the final phase of the "Jump Master" qualification course on May 25 above the Valcartier training area.

Photo: Cpl Marc-André Leclerc

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FEATURES

CONNECTING THE EDGE
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EDITOR'S NOTE

There's always a danger of attempting to draw too many lessons from a conflict still underway. Things that might seem significant early on can lose their relevance over time or regain traction as both sides adapt to tactics. (Tanks, anyone?)

Still, the Russian war in Ukraine is having a sizable impact on defence thinking in this country. During a panel discussion at a provocatively titled symposium in Ottawa in late October, "Putting Canadian Defence Procurement on a War Footing," speakers raised the challenges of military and industrial surge capacity and of our ability to sustain operations from afar for a lengthy period, all underscored by the conflict. As one noted, wargames of a fight in the Taiwan Strait have shown Western nations would run out of munitions in a week.

He wasn't in the room, but many of the points would ring true for LGen Jocelyn Paul. The new Army commander has been drawing his own lessons from what he's seeing in Ukraine. Most confirm the core Army agenda: The relevance of Adaptive Dispersed Operations as an operating concept and the lines of effort in the Canadian Army Modernization Strategy. But the war is also serving as a stark reminder of the critical need to address well-known capability gaps such as air defence, counter UAS, and layered and networked precision fires. It's also reinforced the need for digital transformation and the myriad of projects that comprise Land C4ISR.

The war has also raised questions for Paul about the training system. A Canadian contingent is currently delivering a five-week course for Ukrainian soldiers who will be on the frontlines within days of graduating. A big believer in experiential learning, he's invited everyone in the training system "to have a close look at what is critical and what is nice to have."

"I'm not saying that we need to cut by 50 percent the length of our training," he explained. "But I feel like our individual training system has become way too rigid and way too cumbersome. I think we don't give enough credit to the experience in the unit line. And we do not give enough credit to the collective training experience."

In this issue, Paul shares a great deal about the direction of the Army, as do others in Latvia, in the High Arctic, and on the digital frontlines. Enjoy the read.

Chris Thatcher, Editor

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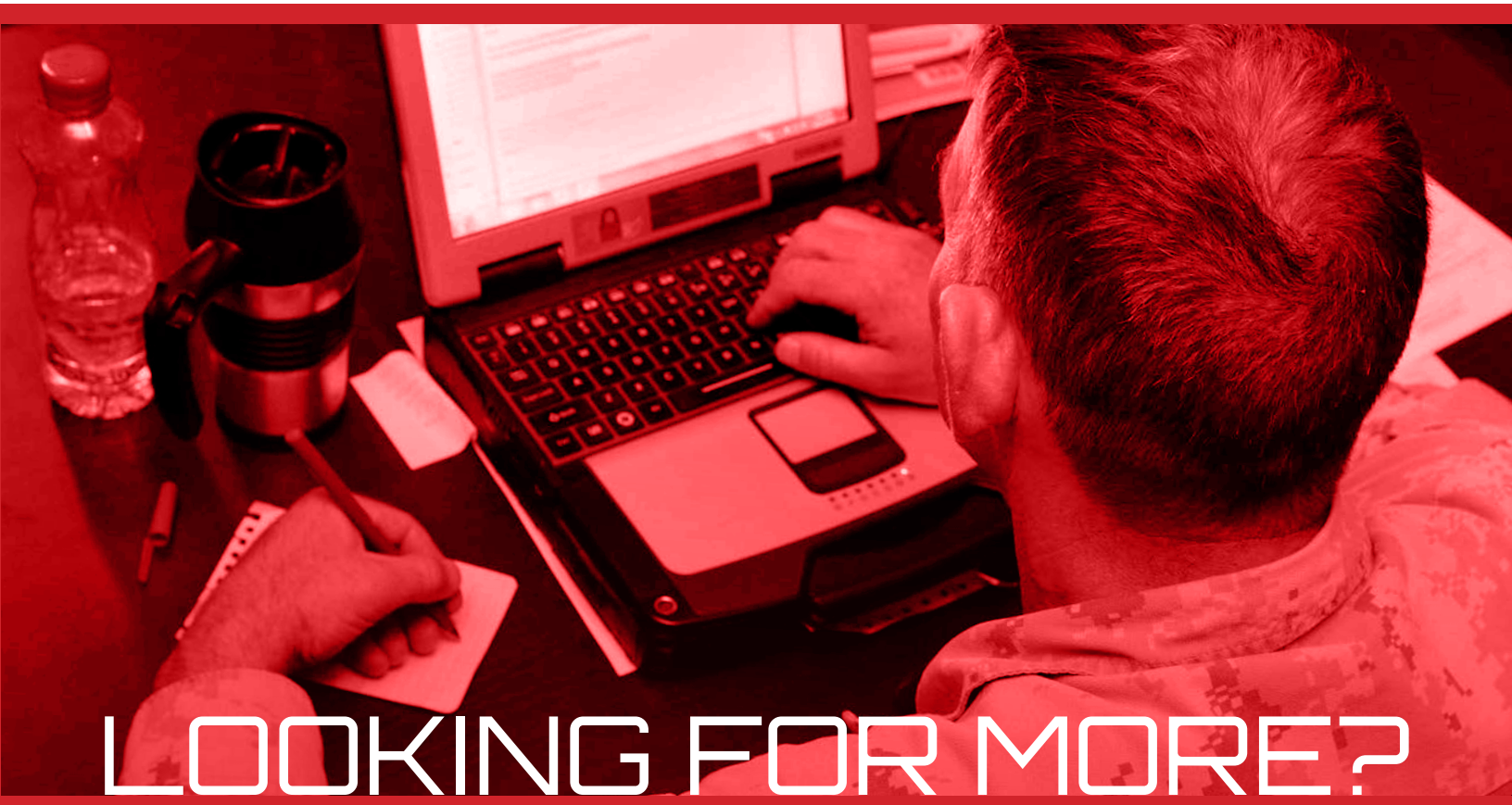

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SIG SAUER P320 TO REPLACE BROWNING HI-POWER PISTOL

By Ken Pole

More than a decade after the Canadian Armed Forces (CAF) identified the need for a new general service pistol, the first of at least 7,000 SIG Sauer P320 semi-automatics should be delivered to the Army in mid-2023, along with magazines, holsters and spares as well as operator and maintainer training.

But it will be later in the year before the modular and mostly polymer composite full-frame P320s make their way through the distribution network to individual units. Delivery times and Department of National Defence (DND) "system acceptance protocols" were discussed during a visit by the project team to SIG Sauer's factory in New Hampshire in late October, and 50 should be handed over before year's end for "systems acceptance testing."

Designated the C-22, the new pistols will be supplied by M.D. Charlton (MDC) Company of Victoria to replace the Army's 1930s-design Browning Hi-Powers. In announcing the contract with MDC in early October, Defence Minister Anita Anand said it would "help ensure the continued operational readiness and effectiveness of all our members." Helena Jaczek, her counterpart at Public Services and Procurement Canada (PSPC), said that in addition to giving troops "modern reliable pistols," the contract would support unspecified "economic opportunities" for domestic industry.

The initial contract is worth $4.3 million but there is an option for up to 9,500 more P320s to cover remaining CAF requirements. The overall potential value is estimated at $10.3 million over five years.

A variant of a pistol that has been in service with other military and police forces since 2007, the P320 is fired by an internal recoil-operated striker rather than an external hammer. The latter is an occasionally annoying and painful feature of the Browning, which can "bite" the shooter when the hammer's spur hits the shooter's hand behind the pistol's abbreviated tang.

Unlike modern double-action semi-automatics, the single-action Browning trigger is not connected to the hammer. It only takes a pull on the trigger or a pull-back on the hammer and then a trigger-pull to fire. That's a possible accident waiting to happen and potentially deadly in theatre where noise can benefit the enemy. MDC says the hammerless feature "dramatically reduces the chances of the gun snagging and firing accidentally."

In November 2020 a Canadian Special Operations Forces member was wounded in the leg when his holstered P320 discharged at a base near Ottawa. An independent investigation concluded the cause was "a partial depression of the trigger by a foreign object combined with simultaneous movement of the slide." Also, the operator was using a "far from optimal" modified holster designed for the unit's older P226s, which were replaced with P320s in 2019.

While the Army's new guns will come from New Hampshire through MDC, their holsters with an active retention device are from Montana-based Blackhawk. Art Hall, a 30-year Army veteran and lead engineer on the pistol project, said the Army specified a drop-leg mounting, but it also can be body armour- or belt-mounted.

The lengthy procurement process suffered a setback in 2021 after a regulatory challenge by Ottawa-based Rampart International to the Canadian International Trade Tribunal (CITT). Rampart, which represents Glock, complained that the Army favoured "a specific pistol design produced by SIG Sauer and Beretta."

A member of 5th Service Battalion fires the Browning 9mm. Photo: Cpl Marc-André Leclerc

Trade rules came into play because SIG Sauer's corporate headquarters are in Switzerland and Fabrica d'Armi Pietro Beretta is privately-held in Italy.

Rampart also challenged a requirement for a removable trigger group (RTG) developed by SIG Sauer to enable the same components to be used in different frames. It also protested requirements for a loaded chamber indicator (LCI), a forward trigger return, a striker deactivation button (STB) or similar mechanism, and a manual safety.

The government said the RTG requirement was operationally legitimate and easier to maintain. As for the LCI and STB, those were critical safety requirements. Moreover, an affidavit filed with the CITT by Keith Grosser, PSPC's contracting authority, and Major Carl Gendron, DND's project director and authority on infantry weapons, noted that DND had conducted extensive testing and market research from 2015 to 2017, including competition-level shooters' opinions of different pistols. It also purchased various models to strip and assemble.

MDC said Rampart was "trying to redefine" the project's parameters to accommodate Glocks and that Rampart had known as early as 2016 that the Army wanted modular pistols with a top-mounted LCI – not the smaller side-mounted LCI common on Glocks and some other pistols.

The LCI on a P320 is readily visible to shooters rather than one requiring physical confirmation which can be compromised by gloves.

Rampart's inference that the procurement deck had been stacked against it was dismissed by Gendron. "You could say the same for pretty much any winning bid after the fact," he told *Canadian Army Today*. "We have very tight and unbiased bid evaluations for our small arms. The reality is that within the funding envelope, we always try to go for top-tier capabilities and features in every weapon and it will naturally restrict the field."

Three sizes of grip modules mean the P320 is readily adaptable to a range of users. James Grant, DND's small arms project manager within the office of Assistant Deputy Minister (Materiel), noted that while all P320s will be delivered with a medium-size grip, each unit will receive several small- and large-size grips to suit individual users.

The P320 uses the same NATO-standard nine-millimetre ammunition as the Browning and has similar ballistics. As well, it offers expanded magazine capacity, is lighter, and can be used effectively by left- and right-handed shooters. It also has an ambidextrous slide catch lever, a user-reversible magazine release, and can be field-stripped without tools.

Rob Cook, MDC national sales manager, said the SIG Sauer factory is "committed" to ensuring timely deliveries, as is MDC's main repair, service and overhaul facility in Mississauga, and a small satellite office in Ottawa.

The thoroughness of the procurement, notably the testing that led up to it, should give soldiers confidence in the Sig. Bulk firing tests through DND's Quality Engineering Test Establishment at a civilian range near Ottawa disclosed no problems. "It passed our test," said Grant. "Standards for everything were well-defined in the RFP and if it hadn't passed, it would have been non-compliant."

As for accuracy, the requirement was 12-centimetre groupings at a distance of 25 metres. "With all the shooting we did, the Sig was averaging about 72 millimetres, so it was very tight," said Hall. A properly set-up Hi-Power could yield similar results, he acknowledged, "but the problem was you would get stoppages and you wouldn't get as many rounds through it."

There are still approximately 11,600 functional Hi-Powers on DND's books, but most are slated for smelting and for museums or military displays. ■

A Military Police member on Op Impact in Kuwait. Photo: S1 Anne-Marie Brisson

SNIPERS SET SIGHTS ON NEW RIFLE

A sniper from the 1st Battalion, Royal 22e Régiment with the C20 rifle. Photo: Cpl Marc-André Leclerc

By Ken Pole

If you're a Canadian Army sniper, you can expect to have your new rifle no later than next April 1. All 229 of the bolt-action weapons, designated C21, are expected to be in the Army's hands by year's end, but it will take time to ensure that everything is acceptable before distribution across the country can be completed.

The Sako TRG M10 Sniper Weapon System, designed and manufactured in Finland, was selected by the Army this June. It's being delivered by Stoeger Canada, the Ottawa subsidiary of the storied and still family owned Italian Fabrica d'Armi Pietro Beretta.

The Sako's interchangeable barrel/bolt system, among other features, is what makes a single weapon multi-functional. It can fire either the NATO-standard 7.62x51-millimetre round, which has the same cartridge dimension as the Winchester .308, or the .338 Lapua Magnum (equivalent to a 8.6×70mm) developed for snipers in the 1980s. The smaller NATO round not only costs roughly a third of the .338, but also reduces wear and tear on the gun.

"A robust, highly capable platform that exceeds the performance of the in-service C14," is how Master Warrant Officer Mike Tousignant described the C21 to *Canadian Army Today*, referring to the medium-range "Timberwolf" supplied by PGW Defence Technologies of Winnipeg in 2005. A master sniper who did two tours in Afghanistan – as a shooter in 2004 and then a detachment commander in 2008 – Tousignant is now with the Directorate of Soldier System Program Management.

"The C21 will allow snipers to train in the lower-caliber 7.62x51mm configuration while maintaining identical human interfaces with the rifle when configured in the higher caliber .338," he said. "Using 7.62x51mm for training is more cost effective than .338 Lapua Magnum and allows snipers to train on ranges with limited distance."

The first Sakos delivered by Stoeger will be used at the Combat Training Centre in Gagetown, New Brunswick, to support "train the trainer" courses in the Infantry School. Then, once current and upcoming snipers have their hands on the Sako, it boils down to practice, practice, practice, because while the weapon is critical to the task, it's the person pulling the trigger who determines success or failure.

"Canada boasts some of the best snipers of any military." So said the British Broadcasting Corporation when it reported that a Canadian Army sniper, Rob Furlong, had set a world record in 2002 by killing an Islamic State fighter in Afghanistan at 2,430 metres.

Furlong took it a little further during an interview with *Maclean's* magazine. "I've been saying this forever," he said. "Canadian snipers are the best in the world. The sniper training program has been around for a long time. It's the foundation, and it's been retooled from lessons learned in Afghanistan. We've built it to be the best."

(A Newfoundlander with the 3rd Battalion, Princess Patricia's Canadian Light Infantry when he served in Afghanistan during Operation Anaconda, Furlong retired from the Army a couple of years after his record shot. He now runs an eponymous Marksmanship Academy in Alberta where, in addition to training domestic and international military and law enforcement personnel, he and his instructors offer a range of civilian courses.)

In Afghanistan, specifically the mountainous Shah-i-Kot valley, Furlong missed his first shot, hit the target's knapsack on the second, and finally succeeded on the third. His record stood until November 2009, when British Army sniper Craig Harrison, after nine ranging shots, killed two Taliban machine-gunners in Afghanistan's Helmand province at 2,475 metres.

Even that was eclipsed by another Canadian in late May or early June 2017, when a Joint Task Force 2 sniper, shooting from a high-rise building during Operation Impact, killed an Islamic State insurgent at 3,540 metres in Iraq. The bullet took 10 seconds to arrive on target. While Canadian Special Operations Forces Command confirmed the shot, details were withheld "for operational and security reasons" and the sniper's identity is still secret.

While Harrison used an L115A3 rifle manufactured by British-based Accuracy International, both Canadians fired .50-calibre McMillan Brothers TAC-50s, designed by McMillan Firearms of Phoenix, Arizona, and arguably one of the finest purpose-designed weapons of its kind.

So, while luck can be a factor in the sniper's increasingly technical role, who knows if the anonymous JTF 2 sniper's record will fall. But history is on the Army's side. ■

AN AUTONOMOUS AMBULANCE FOR THE BATTLEFIELD

By Ian Coutts

Visitors to CANSEC 2022 in Ottawa couldn't help but notice a strange boxlike vehicle parked in front of the exhibition hall. Fitted with enormous tires, the squat contrivance with red crosses painted on its sides looked like a giant child's toy.

However much it might seem to owe to Tonka or Mattel, what they were seeing is the latest iteration of Rheinmetall Canada's foray into the world of autonomous vehicles, the Mission Master XT – Rescue.

Rheinmetall produces two different autonomous vehicles, the XT and a more basic model called the Mission Master SP. The word "platform" gets overused in military circles, but in the case of both vehicles, it's appropriate – they can be fitted with any number of modules for any number of jobs, from hauling cargo to providing fire support to carrying litters.

In the case of the Mission Master XT – Rescue, it now features a module that lets it serve as an autonomous ambulance. "It was developed by students at the Université de Sherbrooke," said Alain Tremblay, Rheinmetall's vice-president of business development. The company gave them a general idea of what they were seeking and asked, "If you had to do something within those parameters, what would you do?"

The result is an enclosed module with room for one stretcher and two medics, and space for oxygen masks and bottles, a defibrillator, and other medical supplies. The basic Mission Master XT platform is fully autonomous and amphibious – operating as an ambulance in battlefield conditions, it would be able to pick its way across rough terrain, following either a predetermined route or guided by a soldier using a tablet or cell phone.

When he spoke with *Canadian Army Today*, Tremblay had recently returned from Eastern Europe, where there is a good deal of interest in the medical version of the XT. "It's exactly the type of module they are looking for," he noted. The Canadian Army is going to be looking at autonomous platforms this fall, he added, so perhaps before long this odd toy-like platform could become a more common sight. ■

Mission Master XT in ambulance mode. Photo: Rheinmetall

WOULD YOU LIKE THAT IN CADPAT OR CADPAT?

A member of 3rd Battalion, Royal 22e Régiment during the final exercise of the basic mountain operations course. Photo: Cpl Marc-André Leclerc

Pants a little faded? Shirt too tight? Boots showing their age? Soon you'll be able to order replacements online and have them delivered to your door. In mid-October, the government awarded Logistik Unicorp a 20-year contract to provide the Canadian Armed Forces (CAF) with operational clothing and footwear.

Under the contract, valued at up to $3.7 billion, the Saint-Jean-sur-Richelieu-based company will supply Regular and Reserve Force members, Canadian Rangers, Junior Rangers, search and rescue technicians, firefighters, and cadets with around 1,222 different items of clothing and footwear.

The kit includes combat uniforms with Canadian Disruptive Pattern (CADPAT) camouflage, combat boots, arid/hot weather boots, mukluks, parkas, headwear, hand wear, sleeping bags and day packs. There are also provisions for ad hoc procurement of operational equipment such as PPE (personal protective equipment) during emergencies.

Until now, the CAF has procured operational clothing and footwear through multiple individual contracts. "By combining the various contracts into one, we will achieve greater efficiency and availability of items the CAF needs and better value for taxpayers," the Department of National Defence (DND) said in a statement.

Once the Operational Clothing and Footwear Consolidated Contract (OCFC2) is implemented, CAF members "will be able to order items online and have orders shipped to their door, while also providing the CAF with the ability to continue distributing uniforms directly to units," DND noted. "This new approach will deliver better resource and inventory management for the CAF, improve item availability, and provide better value for taxpayers."

Clothing and footwear items will be delivered to clothing stores starting in the second year of the contract, and individual online ordering is expected to be available by the third year.

"The members of the [CAF] deserve the best uniforms and equipment required to effectively perform their duties," said François-Philippe Champagne, Minister of Innovation, Science and Industry. "This contract delivers on this promise and provides military members with the needed operational clothing and footwear while also ensuring that the investment will benefit the Canadian apparel, textile and footwear industry and thousands of its workers."

As part of the contract, Logistik Unicorp has agreed to invest in research and development and skills training in the textile, apparel and footwear sectors. The company must also meet mandatory Canadian content requirements that the majority of manufacturing is done in Canada.

"Part of what makes [our] uniform programs stand out is the relentless pursuit of innovation through [R&D] practices, and commitment to proactively help our clients improve their services," said Karine Bibeau, the company's vice-president for client experience.

The OCFC2 is one of several projects integrating Gender-Based Analysis Plus (GBA+). According to DND, Logistik Unicorp has experience with GBA Plus considerations and "procured items will meet the requirements of the diverse CAF population with a faster turnaround time." ■

WHAT HAPPENS WHEN YOU TURN DRONES OVER TO TROOPS?

By Ian Coutts

Sometimes you have an idea that is so good even you are surprised. When Jack Collier showed up at this year's Exercise Maple Resolve in Wainwright in May, with a batch of Uncrewed Aerial Systems (UAS), he anticipated that members of 1st Battalion, The Royal Canadian Regiment, would find them useful.

Collier and his colleagues in the Autonomous Systems Operations Group at Defence R&D Canada (DRDC)–Suffield Research Centre wanted to see just what the troops on the ground would do with them and, he said, "see how that should influence our research program going forward."

What he wasn't prepared for was "the degree to which the UAS were used." The team had brought along 20 multi-rotor UAS. Nothing special, just a mixture of off-the-shelf military and civilian models, but all small enough that they could be "carried in a backpack," and easily deployed. They were given to members of the battalion's recce platoon and other infanteers, all of whom had been previously trained as UAS operators.

Putting a UAS through its paces. Photo: DRDC

"Something I found interesting: The pilots at Maple Resolve were all newly certified," Collier said. Most had just 10 minutes of flying time. "But they were more than able, with us watching over their shoulders, to get comfortable operating the UAS. On the last day, we had about four UAS up at the same time for multiple hours, looking at how the opposition force was moving on their objective, so we were prepared for their attacks."

Ease of use wasn't the only surprise. The UAS were all capable of thermal imaging, typically employed at night, but "even during daytime thermal imagery can be very useful for looking through brush and trees," he said.

Based on what they saw on Maple Resolve, Collier's colleagues will be working on various tweaks that may make UAS even more useful in the future, for instance possibly incorporating what the UAS "sees" onto a map to help the operator orient the unit better. The DRDC team are also looking into how they can carry their research forward, perhaps through cooperation with the Infantry School or the Directorate of Land Requirements. ■

FROM UKRAINE WITH URGENCY

How the lessons of conflict are shaping the Army agenda

Above, LGen Paul participates in 2nd Canadian Division's Indigenous Summer Program, CARCAJOU. Photos: DND

To Lieutenant-General Jocelyn (Joe) Paul, Russia's war in Ukraine has upheld many of the precepts guiding the Canadian Army. It has affirmed the importance of land forces and the simple fact that while navies, air forces and space assets are vital to success, only armies can hold ground. It has confirmed the tenets of the Army's operating concept of Adaptive Dispersed Operations (ADO), of networked combat teams aggregating and disaggregating as required over the battlespace. It has reinforced the lines of effort in the Canadian Army Modernization Strategy (CAMS). And it has raised digital transformation to an imperative.

The conflict has also generated urgency to address gaps in the Army's capabilities, in air defence, counter UAS, and long-range precision fires, among others. And its existence has placed added pressure on an organization wrestling with recruitment challenges and personnel shortages – estimate at about 10,000 across the Canadian Armed Forces (CAF) – as it prepares for an expanded role in NATO: In addition to continuing to lead an enhanced Forward Presence (eFP) Battle Group in Latvia, Canada has committed to working with Latvia and NATO partners to surge a combat capable brigade – an augmented Forward Presence (aFP) Brigade.

While all of that would be more than enough to grab any new commander's attention, when Paul assumed command of the Army in June, he did something unusual. Rather that issue a commander's philosophy or guidance, or conduct a tour of Army bases and headquarters, joining soldiers on training exercises, he spent the first three months in Ottawa listening. After the past year as Deputy Commander of the Allied Joint Forces Command in Naples, and the previous two years in positions away from the Army, he knew there was a lot to absorb and relearn.

A member of 1 R22R A company during Ex Ares on Patrol. Photo: Cpl Sébastien Lauzier-Labarre

I took a different approach. I was 4th Canadian Division commander over three years ago, so I took the first three months just to listen. We all have preconceived ideas. I went against my own tendency, which would have been to go on the road and visit the troops. I purposely didn't issue any specific guidance. I gave my verbal direction during Army Council a few weeks ago. I see my immediate priority as trying to create the conditions so that we can have the right capability. I'm investing myself much more into procurement decision making. Every single time a major Army program is presented to the rest of the department I make sure that I'm there. I'm trying to align the Army program as a whole so that our people can have the right tools in their hands a few years down the road. I'll start visiting the troops before Christmas and into the New Year.

What direction did you put on the table during Army Council?

I've made it clear that, first of all, we will be implementing the Canadian Army Modernization Strategy. I told them that I was not planning on doing version 2 and 3. The time of writing is done. Now it's time for action. We will be making some adjustments based on the lessons learned from the Ukraine conflict, but CAMS is the way ahead.

There are three buckets of decisions that have to be made. We will be tackling the first before Christmas. There are a few items in that bucket, but one we'll be paying attention to is the mission tasks of the divisions. The Reserve mission task is a great concept. But four years in, we need to take stock, assess, and adjust. How has it been delivered? What has been effective? What are areas for improvement? And are there areas where Canada, the CAF and the Army would benefit from other types of mission tasks? One of the lessons of Ukraine (for example), has been their [effort] to go after the logistical tail of Russia. What do we need to do to strengthen and reinforce force protection for the logistical tail of the Canadian Army? In the second bucket, we'll look at Army structure (Force 2025). Everything is on the table.

What specifically about the war in Ukraine has challenged or changed your thinking?

You need to be in a position to compress your OODA (Observe, Orient, Decide, Act) loop, your decision-making process, as soon as you pick up something, so that between the sensor and the effector you can bring the effect on target as soon as possible. Even if you have less capability, even if you have less guns or less tanks or less troops. That gives you a clear advantage on the battlefield.

A 3 RCR member firing the .50 calibre heavy machine gun training at the Joint Readiness Training Center in Fort Polk, Louisiana, in February 2022. Photo: Cpl Sarah Morley

It's not new. We've seen in history multiple examples of smaller armed forces defeating a much larger force. And I would offer these were better sustained, more agile, and better led. That's what we see right now in Ukraine. And this is what the Canadian Army should be aspiring to. I like to say that we have the best small army in the world. Our people are extremely talented. We have good, well-trained leaders. We have great soldiers. But there are a few high-end capabilities that we need to procure as soon as we can.

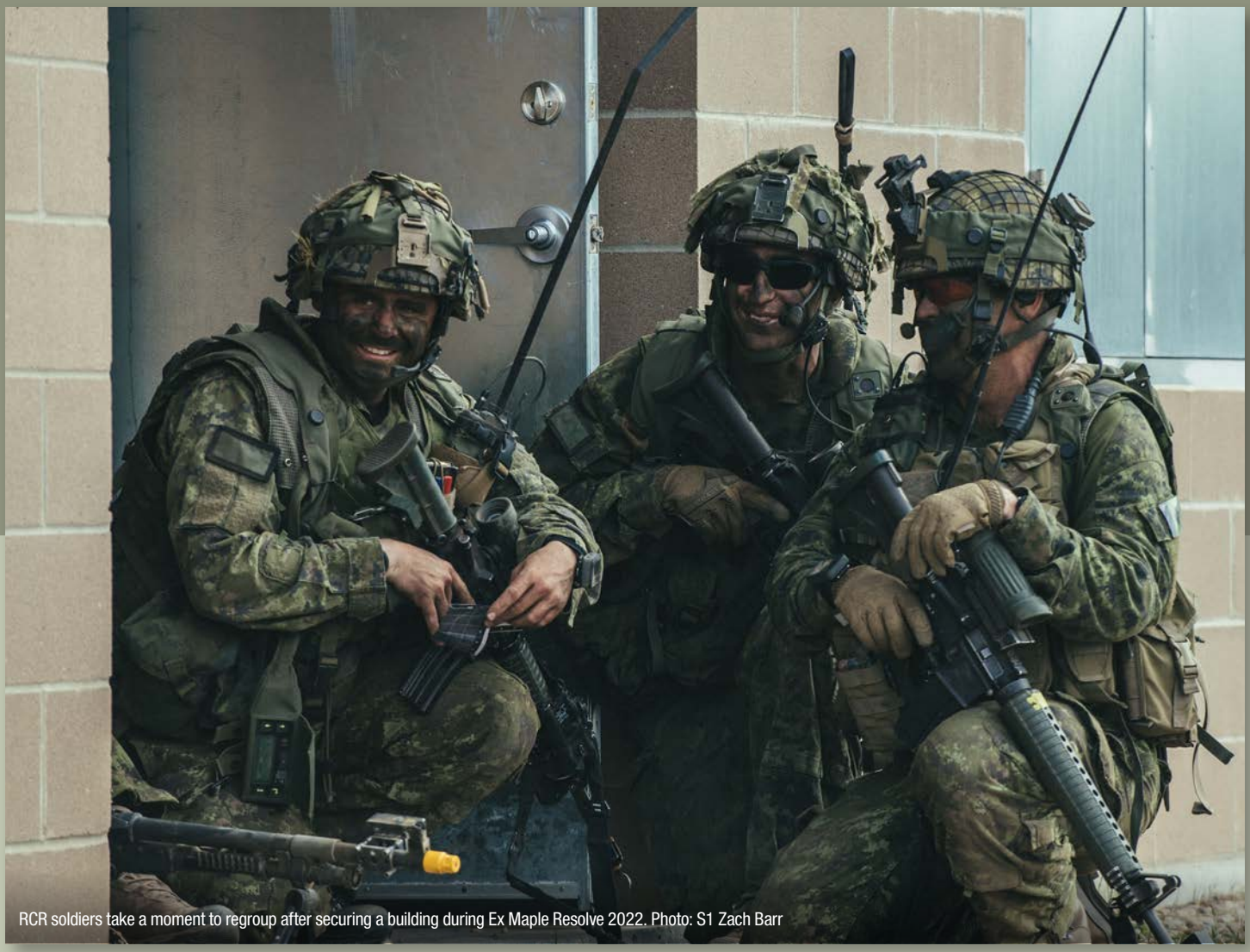
Today's game, and we can see that in Ukraine, is long-range precision fires. You need to be able to prosecute targets at 70, 80, 90 kilometers as a land force. But to bring these fires, you need your sensing function, and it must be a multi-layered system. You need multiple sensors, multiple effectors, and the capability of moving data. You need a digitalized environment where, instead of doing everything manually, you are able to make the management of the information more automatic and, in the future, supported by artificial intelligence. This is what we are looking at right now. All of this has been well articulated in the past, but I would offer to you that Ukraine is basically confirming that CAMS is on target.

Does the conflict reprioritize any of your capability requirements? Is what you're seeing in Ukraine creating more urgency?

Yes. There are constraints, obviously. Some processes I do not own. But regarding everything that is under my purview and within my authority, absolutely, we're trying to move as fast as possible. The Army programs are competing for space with programs from the Navy and the Air Force. But I must say, the fact that the government has accepted to have a leadership role of the eFP Battle Group in Latvia has certainly been acknowledged by everybody in this department. And there's recognition of the fact that we could end up having to speed up some of these projects.

The most urgent ones have to do with air defence, counter UAS systems, and anti-tank systems. These are in the machinery and moving as quickly as they can. But these are the basic entry points. I keep reminding everybody that it's not because you have a point air defence system on your shoulder that you have air defence – it's just one of the many moving parts. You need to have radars, mid- and long-range fires. An M-SHORAD (Maneuver-Short Range Air Defense) system like the one we're looking at right now is like a band aid, it's a quick fix. What we are after is a totally integrated, much larger type of capability. But that program is going to take a while before it can deliver.

The number one thing on which I'm focused right now is C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and



RCR soldiers take a moment to regroup after securing a building during Ex Maple Resolve 2022. Photo: S1 Zach Barr

Reconnaissance). Everything that has to do with command and sense. We have multiple projects that are trying to address current deficiencies. You need to be able to optimize your sensors and your shooters, [and for that] you need to draw data, convey data and analyze data. You need to provide commanders the decision-making tools they need to make the right decisions quickly. And you need to secure these networks.

But as we move toward being more digitalized, we still need to be able to do HF, VHF radio, we need to maintain the capability of laying lines. It wouldn't take much to shut down the GPS constellation. So, just as you train to navigate with your compass, you need to be able to operate your command-and-control system with lines. I believe there's still a place for runners in our organization, with a motocross bike or an ATV. You need to have a multi-layered system that gives you redundancy.

Is there anything that needs to be brought forward now?

Everything that has to do with the aFP brigade. If it does not contribute to deterring an authoritarian regime, I'm not interested right now.

You've added artillery and electronic warfare to the battle group in the past year. What other capabilities do you think need to be integrated in Latvia?

It will be a negotiation. The eastern frontier of NATO has new brigades, new divisions, and new corps. They are all at different levels of readiness. To be clear, Canada is not going to be cloning 4 (Canadian Mechanized) Brigade (that was stationed in Germany from 1957 to 1993). The Army of today is not at all the same as the Army in the early '90s. We will certainly have a reinforced Canadian presence in the brigade. But at this point, we can't say whether we are going to be picking up function A, B, or C. We'll need to have a discussion with our closest allies … and try to identify the gaps. If there are gaps, then we're going to have a discussion with SHAPE (Supreme Headquarters Allied Powers Europe), because NATO has its own force generation process.

These formal discussions have not started yet. Over the next weeks, there will be meetings with the nations that are currently contributing to the battle group. We'll put everything on the table. And then it's going to be a case of, 'Okay, what is it that you can do? What is it that we can do?' But since we are the lead nation, there's going to be an expectation that if there's a gap, people will look at us first to fill it.

If it's not mass, more infantry, that you can add, does that suggest much more investment in the Canadian Combat Support Brigade. Do their specialized capabilities plug some of those potential holes?

Soldiers on the Urban Operation course conduct tactical breaching with a Remington 12-gauge shotgun in Gagetown in April 2022. Photo: Cpl Morgan LeBlanc

As I was watching the conflict unfolding from my perch in Naples, having lots of discussions with Romania and Bulgaria because of the job I was filling, everybody was looking for the same type of capability: What I like to call low density but high payoff capability. The demand was always around air defence, anti-tank, electronic warfare, UAVs, long-range artillery. With some of these items, like long-range precision fires, we're not the only country within the Alliance that has shortfalls. That's why right now you see many Western democracies trying to build up their inventory with some of these high-end systems. So, as we go into the queue for procurement, we need to understand that we are not alone.

That would seem to suggest that programs like indirect fire modernization, which are still in the early phases of procurement, need to deliver sooner rather than later?

You can get range using different means. You can have the traditional howitzers, but you can also have loitering munitions, a drone flying on its own and waiting to engage a target. So, within that family of effectors, what is it that we have? What is it that our closest allies have? How can we integrate that? And what is it that Canada might be willing to invest in? With our fiscal reality, we cannot procure everything, so we need to make the right choices. But these choices have to be informed by what our allies can do as well.

There's one thing that is always in the back of my mind: Any type of weapon system or piece of equipment that can deliver the same effect with less people, I'm very fascinated by it. This is the essence of being effective. I need to be in a position where I can deliver the best return on investment as an Army commander.

The artillery battery in Latvia now is experiencing that – the towed M777 is more personnel-intensive than the mobile platforms of allies.

You are more vulnerable when the counter battery fire comes in. The M777 is a great piece of gunnery. I have used it extensively. But [it] was procured as an urgent operational requirement, not a major capital project. It was something that we quickly surged because we needed it in Kandahar. But mobility is key. And we're not the only Army looking at this. The U.S. Marine Corps has announced that it will be parking very shortly many M777s, but it will be investing in long-range precision fires. (The Marine Corps' Force Design 2030 plan would reduce the number of active duty M777 tube artillery batteries from 21 to around five and add more High Mobility Artillery Rocket Systems.) That phenomenon is visible with most of our allies.

A member of 2 RCR provides cover for his section during Ex Maple Resolve 2022. Photo: Cpl Aimee Rintjema

As you look to replace equipment like the M777 and Carl Gustav rifles that have been provided to Ukraine, do you restock or is this an opportunity to consider alternatives or other ways of achieving the same effect?

In the case of the M777 it is very simple – the production line is closed. If I wanted to procure an additional 25, I would have to go to the secondhand market. So, this is where we need to look at protection, mobility, effectiveness, connectivity, and moving data. And when it comes down to indirect fire, it's all about precision. As a Western democracy, we care about collateral damage. Whatever we do as an army has to be surgical.

Do you have an indication yet of what might be asked to surge the aFP brigade?

By next spring we'll have a good idea of our commitment to the aFP brigade. It could be anywhere between 2,500 to 5000 troops. There will be people deployed on six- or nine-month tours, but there will also be a lot of what we call fly-in, fly-out positions – you may go and do a collective training event, and then go back to your home garrison. It's going to be a mix of everything.

There is an ongoing defence policy update that will be presented to the government. We'll see then how much treasure the government is willing to give us. Because, as I like to say, a vision without the resources is just a hallucination. If I don't have the money, if I don't have the people, if I don't have the kit, it's not going to happen. Until I know how much resources I'm allocated, it's kind of difficult to reorganize.

Related to your C4ISR priority, you recently published an Army digital strategy that shifts digital transformation from one of many priorities among four lines of effort in CAMS to what you are calling the vital ground. What needs to happen more quickly for you to see the sort of transformation you outline?

You need to have people with grey hair like me embrace it. For the youth, the leadership of tomorrow, programming, computing, moving data is something that is more natural to them. We need to ensure that at the mid-leadership and higher leadership level, we have an open mind to the importance of that transformation. Personally, I never miss an opportunity to sit down and listen to the young men and women who understand that aspect of the business much better than I do. Every single time I do, I learn something new. Data is like the new currency. I do not want to become too centric on data, on digitalization – we need to be redundant – but we need to acknowledge that the OODA loop has been compressed so much that it's almost like a military revolution. If you're not at the forefront of it, you don't want to be the horse cavalry of the next conflict.

A bombardier with 1st Regiment, Royal Canadian Horse Artillery during a fire mission in the Wainwright, Alberta, training area in October. Photo: Cpl Djalma Vuong-De Ramos

Given your personnel shortfall, are you in a scenario where you need digital transformation to attract the youth, but at the same time you need youth to drive digital transformation?

As a country over the last 30 years, the average age has increased by about eight or nine years. This is a national problem, a western world problem. It's a societal choice that we all made collectively. We are competing with the private sector and unemployment is so low that youth have many different opportunities. To attract that talent, we need to give them a positive experience. When they join the team, we want to ensure that they are well lead, well looked after, with the right type of benefits. It's not only about money; it's also about positive leadership, about team spirit. This is why culture is so important. As with retention, there's no silver bullet; it's going to be the cumulative effect of many different initiatives at different levels to mitigate the challenge.

Indigenous communities have been among the fastest growing in this country. In your role as the CAF champion for Indigenous Peoples and given your background [Paul is a member of the Huron-Wendat First Nation] do you see yourself in a position to influence more Indigenous youth to consider the military?

Enhancing recruiting is something that I would like to be able to help Chief of Military Personnel with. I want to ensure that our four summer training programs are optimized. We had a great turnout on Bold Eagle this year, more than 90 graduates. My own nephew graduated from Carcajou in Quebec. If you want to have a healthy army, you need first and foremost to have a healthy Reserve, because many opt for a component transfer like I did many years ago. The summer Aboriginal program will certainly contribute to this.

For Aboriginal youth, it's about having a great experience as a serving member. In the aftermath of the First and Second World Wars, many of our Aboriginal veterans, when they came back to their communities, ended up being the future leaders. They ended up doing greater things. When I talk to Aboriginal youth about my own experience, I always tell them, "Whether you do one or two years as a Reservist, four or 30 with the Regular Force, when you go back to your community, you will have leadership skills, you will have had the opportunity of traveling, and you will be a better human being." Education is the key to improve our collective quality of life in the Aboriginal community. With education comes economic opportunities. I think the Army and the CAF can certainly play a critical role in that regard. ■

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  - Team Awareness Kit (TAK) as a foundational battle management building block
  - Integration with any of the latest MESH Communications solutions
  - Power and Security Management
  - Supporting EUDs, Hubs and mission manager hardware

- ***Enterprise Command and Control (C2) Gateway Layer***
  - Modularity and Adaptability thereby enabling integration into higher level
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Into the Fight

ON OP UNIFIER, TRAINING UKRAINIAN SOLDIERS COMES WITH A SENSE OF URGENCY

By Chris Thatcher

Training soldiers for future combat comes with distinct pressures; training soldiers knowing they will be in the fury of a life-and-death fight within days of completing your course is something else altogether.

Yet that's the dynamic for a team of around 170 Canadian Armed Forces (CAF) members, most of them instructors from the 3rd Battalion, Princess Patricia's Canadian Light Infantry (3 PPCLI). In August, they were deployed to a base in the southern United Kingdom to help prepare Ukrainian soldiers for war.

Under Operation Unifier, the CAF has since 2015 trained more than 33,000 Ukrainian military and security personnel in tactics and advanced skills from bases in Ukraine. The mission was paused on Feb. 12 and the trainers relocated, just prior to Russia's invasion of that country.

The resumed Op Unifier under a British-led multinational training mission called Op Interflex has many of the same core training requirements, but how Canadian instructors approach their job is vastly different, acknowledged Major Mike Pal of 3 PPCLI and the commanding officer of the Canadian contingent.

"We have had to have a humble and empathetic approach and just remember the context," he said. "We need to remember where they are coming from and where they are going to. Immediately after this training these troops are going to be back on the frontlines fighting for their lives. It adds a sense of urgency and importance to what we are doing, which I don't think is lost on any of the soldiers here. It is a very different feel from running a course in Wainwright or Gagetown. The soldiers are a lot more focused."

Canada was the first international partner to join Op Interflex and has deployed two large training teams as well as a small headquarters, a force that can be expanded to over 225 personnel if needed. Though the training is basic, Pal was sensitive to Russian information gathering and cautious about being too descriptive of the course material or the number of Ukrainian students in each serial.

"We don't have these people for a long time," he noted, so what instructors impart can make them better soldiers, but it can't replicate years of experience.

The flexible curriculum covers individual skills required for frontline combat, including weapons handling, battlefield first aid, fieldcraft, patrol tactics and the Law of Armed Conflict. Broadly, the training is focused on four areas: helping soldiers better shoot, move, communicate, and medicate.

"Everything we deliver is informed by the needs of that training audience, how they have been or will be fighting, and not necessarily by our own doctrine," Pal explained. Though the basic tenets of infantry skills – shoot, move, communicate, medicate – are universal, it has been an "interesting challenge" for an Army used to basing instruction on foundational doctrine.

"One of the advantages we have with this program is we don't have to follow a rigid lesson or training plan like we would in Canada delivering training at a school," he noted. "That allows us to be a learning organization that has a fast feedback loop, so we can inform changes to future serials immediately without going through the administrative process of changing a training plan or a qualification standard. That allows us to react to the J2 (intelligence) feed we receive from theatre."

Some Ukrainian soldiers and the leadership that observe the program come with combat experience and "are able to share low level tactics, techniques and procedures that they have learned in the limited experience they have,"

An instructor from 3 PPCLI mentors a Ukraine soldier during dynamic live fire pairs ranges on Op Unifier in September. Photo: Cpl Eric Greico

said Pal. "That allows us to inform changes to future serials."

The majority, however, are raw recruits with little prior training. Furthermore, "they are generally not aware of the role they are going to play when they return to the Ukraine," he noted.

The modular five-week program begins with basic soldier skills such as how to pack a rucksack, assemble equipment, and importantly given the nature of the war they are in, the Law of Armed Conflict – "how to behave when you are in a war," Pal emphasized. It then progresses to tactical training, such as rural area patrolling and basic urban operations, before closing out with live fire scenarios. Though the training is focused on the individual soldier, the skills are taught in the context of a section.

At the time of the interview, Ukrainian fighters had begun to retake territory from Russian forces in a counteroffensive across several eastern regions. While the training corresponds to what is unfolding on the battlefield, the shift from largely defensive operations in the first months of the war to some offensive manoeuvres had not translated to any changes in the tactics instructors are teaching, he said.

"What we try to do as Canadian teams is focus on two things: survivability and instilling an offensive spirit in these guys."

The 3 PPCLI instructors are part of the 14th rotation of Op Unifier since 2015. Previous commanders have handed off the mission with sound advice for their successor. Because each roto took place inside Ukraine and under less dire circumstances, there were few notes to compare when he assumed command.

"I can't speak about what it felt like [for the other rotos], but I imagine there is a greater sense of urgency to what we are doing now," said Pal, who has deployed three times to Latvia under Operation Reassurance and understands the dynamics of the region. "This mission is so different from the previous training that, even though it is still called Op Unifier, we really treated this like a Roto Zero."

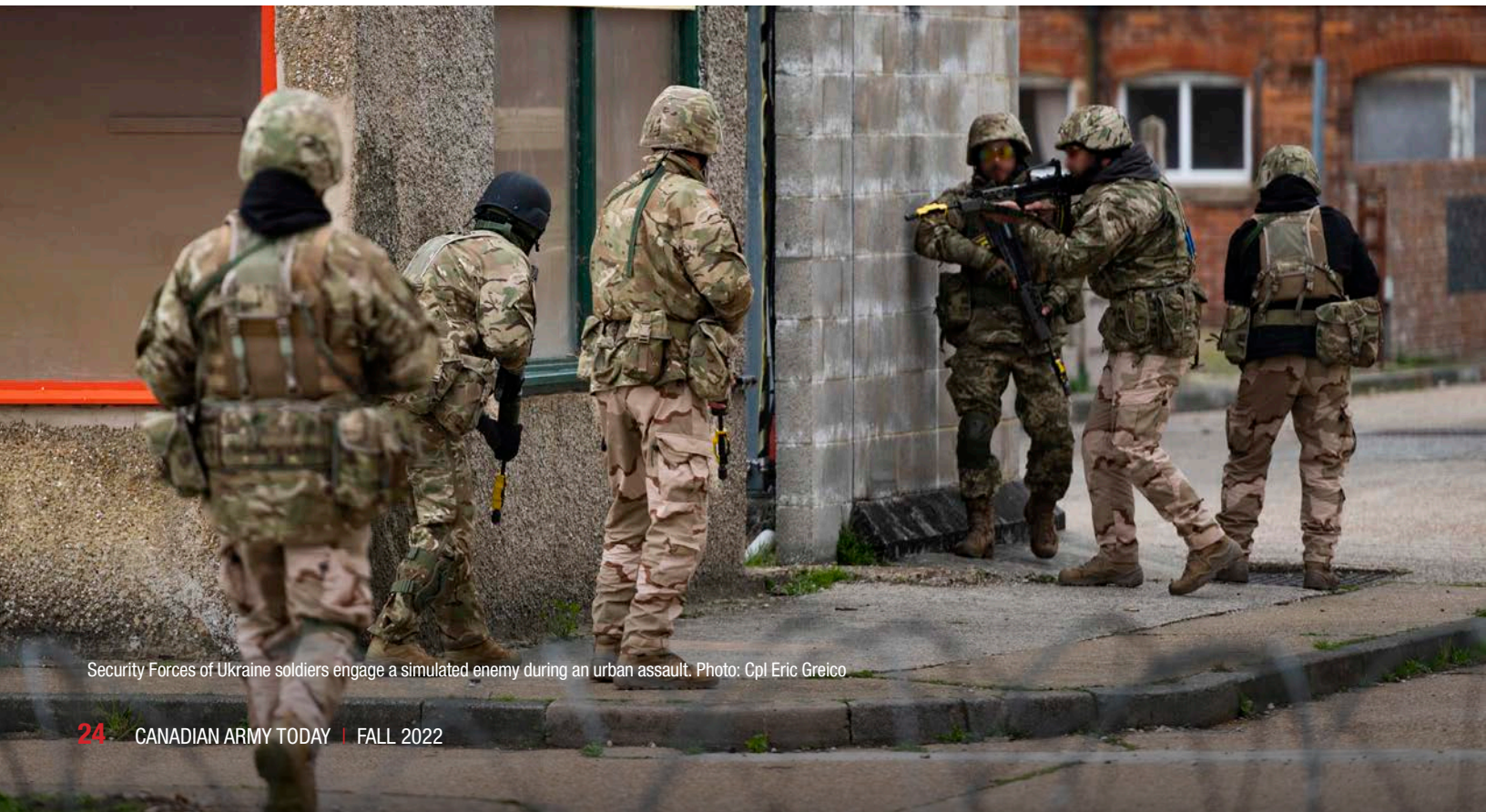
Op Unifier was recently extended until March 2025, but the deployment to the U.K. was initially set for approximately four months. He said the current roto is not working toward any specific timeline, and is prepared "to be here as long as needed."


Instruction in tactical combat casualty care. Photo: Cpl Eric Greico

A number of countries including New Zealand, the Netherlands, Germany, Norway, Sweden, Finland, Denmark, Latvia, and Lithuania have committed to providing training assistance under Op Interflex. Some, such as New Zealand and Lithuania, already have instructors in theatre and, while all countries are working toward the same training objectives, there are noticeable differences in their approaches, Pal observed. "Each country is bringing something unique, which is really neat to see."

The Ukrainians have been an eager and responsive training audience, he added. Though they are aware of the dangers they will soon face, "I don't get a feeling of apprehensiveness from them. They are very proud and eager to learn.

"I am proud and humbled to be a part of this mission and I am proud of the quality of instruction that Canadian soldiers are able to deliver," he said. "Everyone is punching above their weight." ■


Security Forces of Ukraine soldiers engage a simulated enemy during an urban assault. Photo: Cpl Eric Greico

The LAV 6, like all other Army vehicles, will be integrated into the next Land Command Support System. Photo: Cpl Jonathan King

IS THERE A CANADIAN ARMY APPROACH TO JADC2?

CANADA'S COMBAT POWER IS TECHNOLOGICALLY DEPENDENT. CAN THE ARMY'S DIGITAL STRATEGY BE A BRIDGE TO JOINT ALL DOMAIN COMMAND AND CONTROL?

By Dave Jones and Bruno Perron

The Canadian Armed Forces (CAF) is either currently engaged with or intends to go to market with an impressive group of large-scale Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) projects that will deliver the next generation of digitally-enabled warfighting capabilities. It is crucial that these programs are shaped by the doctrinal ambition of Joint All-Domain Command and Control (JADC2) so that the interoperability challenges of systems from the network-centric warfare era are avoided. Unlike our U.S. partners, CAF leadership is rather silent in articulating a coherent strategy, vision, or set of grounding principles that will help collectively the Canadian Army, other CAF services and Canadian defence industry deliver those digitization ambitions.

Many of the elements necessary for success are present throughout the CAF, in doctrine and element specific projects, but unity of effort in the joint environment would maximize the value of generational C4ISR investment programs. Deliberate effort is required to bridge the gap between procurement, doctrinal concepts, and training, which will all need adaptation – with a focus on jointness – while implementing this new generation of systems.

THE MIRAGE OF INTEROPERABILITY

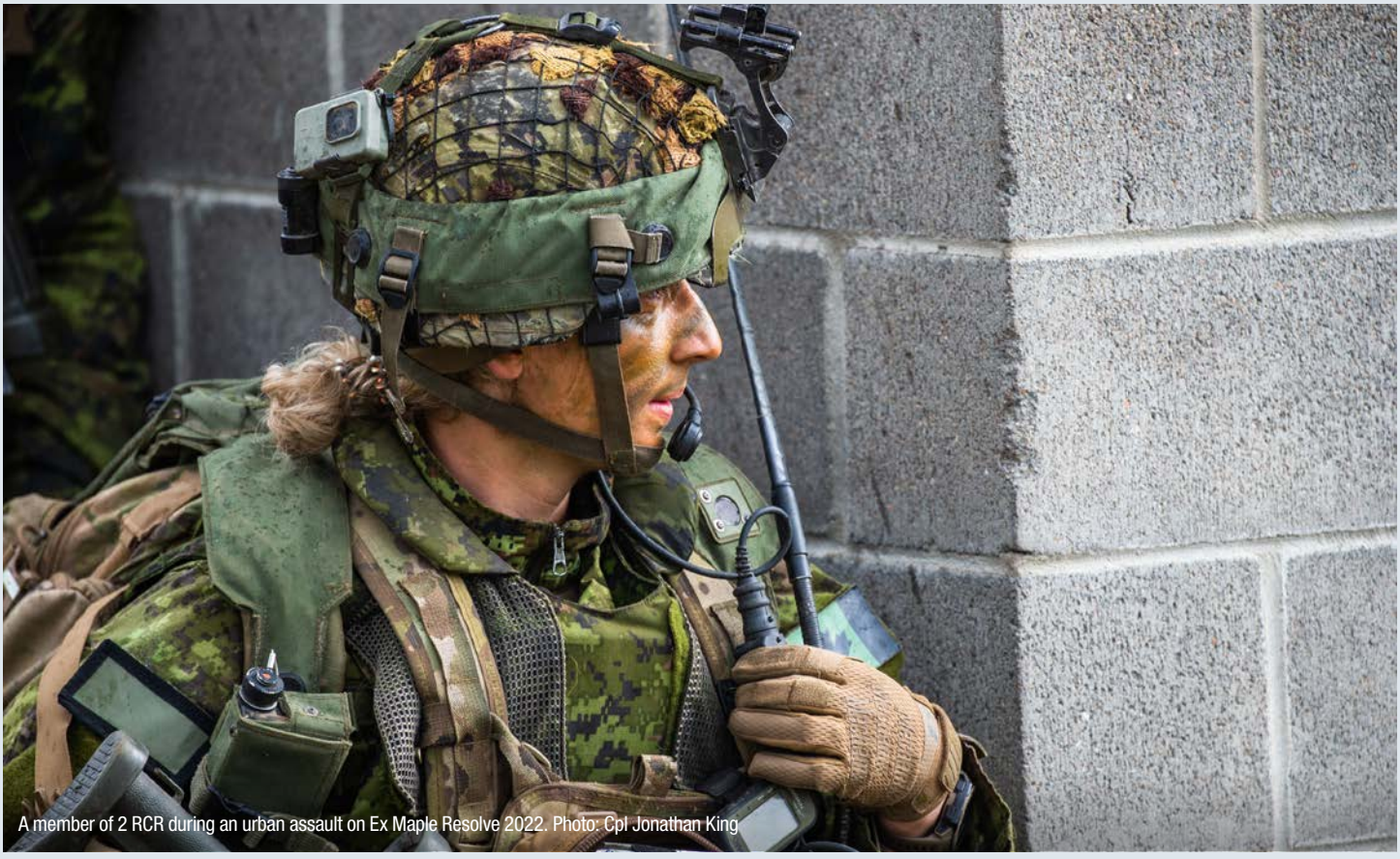
The Army, Royal Canadian Navy, Royal Canadian Air Force and Canadian Special Forces rely on systems and networks that collectively empower warfighters to deliver capabilities for government objectives. Most of the existing suite of systems are evolutionary from the advent of network-centric warfare pioneered in the 1980s and 1990s, and perhaps best exemplified by the First Gulf War. They have evolved throughout the last decades to underpin joint warfare, enabling high-level commanders with the ability to leverage capabilities from multiple elements or domains. The current Army Land Command Support System (LCSS) is due to be life-cycled and presents the opportunity for increased interoperability, analytics power, and AI-enabled decision support.

But jointness is a bit of a mirage. A former Director of Operations at the U.S. Joint Chiefs of Staff, U.S. Air Force LGen John Dolan, now a vice president at Raytheon Intelligence & Space, has said: "Historically, when we communicate in a large battle, every service [or element in Canada] kind of takes their own approach — an air-centric approach, a ground-centric approach, a navy-centric approach." Is there an opportunity for the next iteration of LCSS to truly enable integration of joint combat power?

In practice, only specialized Joint Force Commander Headquarters are truly able to benefit from information and intelligence produced by the many Land, Maritime, Air, SOF and Cyber capabilities. Although extremely beneficial to operational and strategic decision makers, lower-level tactical commanders still have difficulty accessing potentially fight-winning or even life-saving information from Joint capabilities. The hard truth is that the CAF, like many NATO partner forces, is underperforming when it comes to conducting Joint operations – and technology is often the reason why.

As U.S. Marine Corps LGen Dennis Crall explains: "This [need] really came to light in some of the crisis actions that we went through for things like

Soldiers from 3 R22R prepare to conduct a reconnaissance mission in Fort Greely, Alaska during Ex Joint Pacific Multinational Readiness Center in March 2022. MS Dan Bard



A member of 2 RCR during an urban assault on Ex Maple Resolve 2022. Photo: Cpl Jonathan King

Afghanistan, and even what we're seeing now in the Russia-Ukraine conflict – looking at just simply trying to pull information out of systems that just do not behave right. We can't live this way any longer."

Furthermore, a lot of the newly connected data is not exploited or maximized at machine speeds, instead burdening the warfighter's cognitive workload with frequent menial tasks akin to data entry. The next iteration of LCSS capabilities should aim to push the boundaries on the value of data, empowering decision-makers and possibly enabling a highly automated sensor-to-shooter network. The recently published Army Digital Strategy reinforces that thought.

JADC2 ENTERS THE CHAT

The ambitious Joint All-Domain Command & Control (JADC2) strategy aims to not just tackle the interoperability challenges experienced with network-centric warfare technologies, but it also addresses how the mounds of data, coupled with artificial intelligence will vastly improve decision making at all levels. The U.S Department of Defense explains the concept: "JADC2 provides an approach for developing the warfighting capability to sense, make sense, and act at all levels and phases of war, across all domains, and with partners, to deliver information advantage at the speed of relevance."

At the center of JADC2 is warfighter decision making, empowered by three main activities:

- "Sense" – Integrate Information Across All Domains and the Electromagnetic Spectrum, which is defined by the ability to discover, collect, correlate, aggregate, process, and exploit data from all domains and sources (friendly, adversary, and neutral) and share the information as the basis for understanding and decision making.
- "Make Sense" – Understand the Operational Environment, with key ambitions to integrate predictive analytics, machine learning and artificial intelligence.
- "Act" – Decide and Disseminate decision to the Joint force and its mission partners. The JADC2 strategy makes specific mention of using a Mission Command approach empowering subordinate commanders with the confidence, authority, and Joint resources to accomplish a senior commander's operational intent.

The U.S. military is already experiencing procurement obstacles to meet the challenge of JADC2. Northrop Grumman's chief technology officer Scott Sapp has said that "the services — which by law are responsible for budgeting and managing acquisition of weapon systems — remain focused on fixing service-specific problems in connecting their individual platforms, sensors and C2 networks, rather than thinking across the width of the military."

Instead of individual services, the CAF is separated into comparable elements, which like in the U.S. play a significant role in procurement. This creates artificial obstacles for programs intended to address technological challenges to Joint operations.

MIND THE GAP

Over the next years, the Department of National Defence intends to deliver numerous massive C4ISR projects worth multiple billions of Canadian dollars. These are spread throughout the Force, with each service leading a portion. This is not the complete list of C4ISR projects, but a short list of the key upcoming capabilities that would be a good fit within a JADC2 construct to articulate the complexity of this procurement challenge:

Royal Canadian Air Force

- NORAD Modernization;
- Platform specific C4ISR capabilities (RPAS project, CF18 replacement program); and
- Tactical Integrated Command, Control and Communications Air (TIC3Air).

Royal Canadian Navy

- Platform specific C4ISR capabilities (CSC, AOPS, JSS);
- Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) unmanned aircraft system (UAS).

Canadian Army

- Intelligence Surveillance Reconnaissance Modernization (ISR Mod);
- Land Command Support System - Tactical Command and Control Information System Modernization (LCSS - TC2ISM); and
- Joint Deployable Headquarters and Signals Regiment Modernization (JDHQSRM).

Information Management Group

- Information Technology Infrastructure in Support of Command and Control (ITI in Sp of C2).

Canadian Forces Intelligence Command

- Network enhancement projects.

In addition to this list of digitization projects, there are many other smaller scale sensor-to-shooter enhancement projects across the CAF. It is appreciated that the CAF is looking to address shortfalls and aim towards achieving technological superiority. Invariably, the short list above is a set of extremely complex and sophisticated capabilities, which leads us to ask a few questions: Does the CAF want to interconnect these capabilities for a Joint force commander, and extend to subordinate Army commanders? What is the glue between all these DND/CAF C4ISR projects? These complex projects will get awarded to different prime contractors: Who is the CAF chief architect that sets the cadence in terms of the network solution to implement?

Increasingly in vogue is this term glueware to denote crucial gaps between various individual defence requirements.

To avoid the underperformance of Canada's network-centric warfare capabilities, DND's procurement community needs to articulate requirements that position its C4ISR projects for successful implementation of JADC2. But the first step is that the CAF leadership needs to set a strategy so that both the troops and defence industry all have a shared and common understanding, if there is the ambition to build this joint all-domain warfighting enterprise.

Because this JADC2 architecture is such a leap forward, CAF leadership must also understand that they must increase their trust and reliance on defence industry technology leaders who understand and can deliver on the ambition, and who devote significant efforts to fully understanding the detailed user-experience required to deliver on this conceptual promise. The Army Digitization Strategy combined with the list of projects above is evidence they are thinking in the right direction and in absence of a true joint strategy that includes industry's role, they will likely be the service that pulls the next iteration of joint interoperability. ■

LCol (Ret'd) Dave Jones is VP Business Development at CINTIQS. He served 29 years as an Air Force Communications and Electrical Engineer and Special Forces operator, spending most of his time in Joint and Special Forces communities. His last Regular Force appointment was leading CANSOF's C4ISR capability development portfolio.

Maj (Ret'd) Bruno Perron is a Solutions Architect at CINTIQS. He served 12 years as a Canadian Army intelligence officer providing human terrain advice to technologically focused commanders within Canada's Signals Intelligence, Electronic Warfare and Cyber communities. He also served as a foreign exchange officer at U.S. Cyber Command.

Digital Fires next bound

At Bold Quest 2022, the Army tested its digitally aided close air support system as a tool for communicating surface-to-surface fire support.

By Chris Thatcher

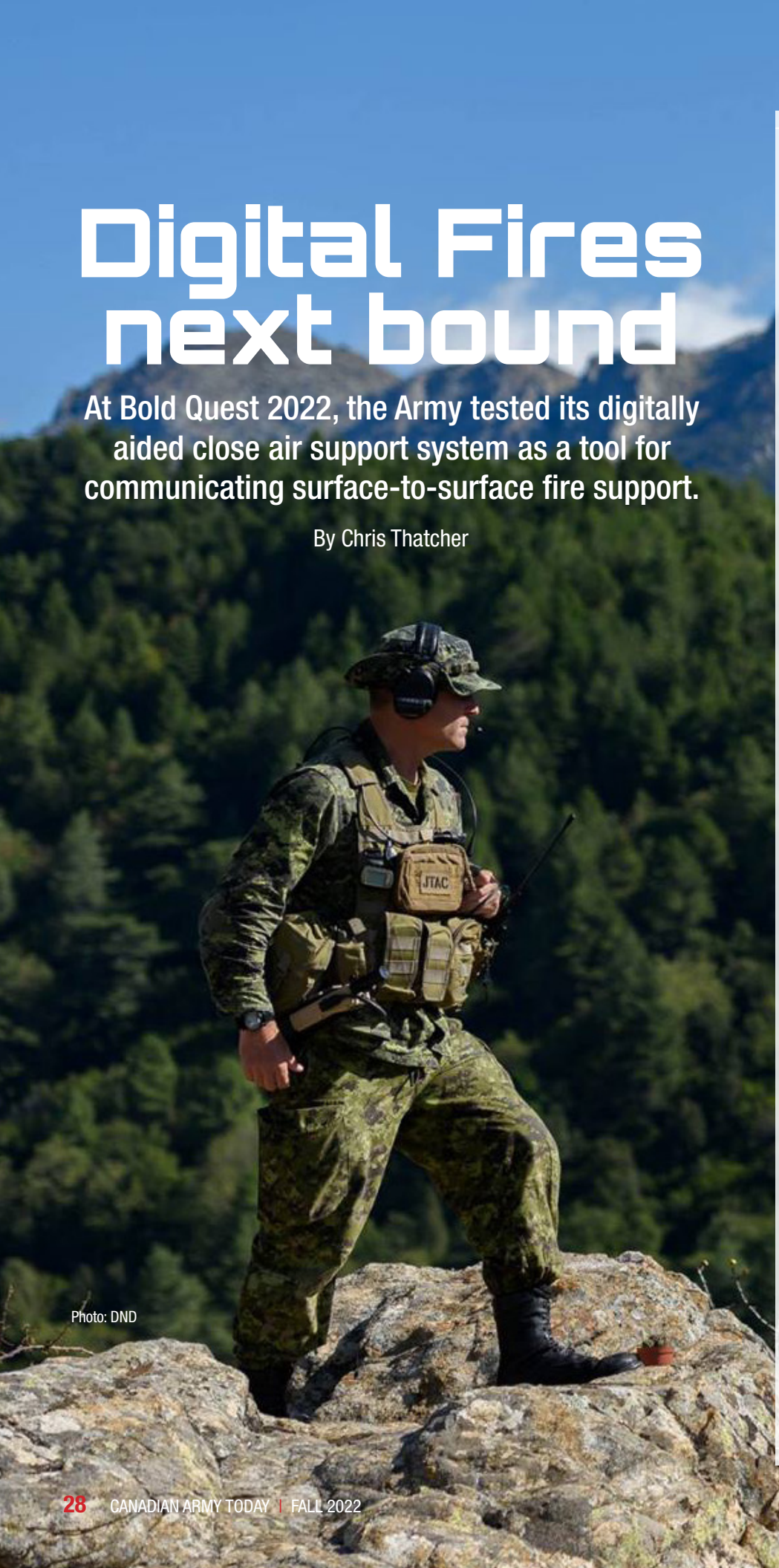


Photo: DND

Six years ago, the Canadian Army acquired an Android-based Digitally Aided Close Air Support (DACAS) system that has fundamentally changed air-to-ground CAS engagements. Rather than passing all information by voice for manual entry into aircraft systems by the pilot, Joint Terminal Attack Controllers (JTAC) can now send digital targeting information collected using a laser range finder directly to a pilot and their mission computer in a CF-18 or allied fighter with just a few taps on a tablet.

That DACAS system continues to evolve, but the Army is now evaluating if the Android Tactical Assault Kit (ATAK) software application can do the same for surface-to-surface artillery fires.

During Bold Quest 2022 in Fort Stewart, Georgia this summer, a cross-functional team from the Joint Fires Modernization (JFM) project in the Directorate of Land Requirements and the Assistant Deputy Minister (Materiel) branch, members of The Royal Regiment of Canadian Artillery School, and targeting subject matter experts from the Joint Warfare Centre participated in the Joint Fire Support Joint Mission thread.

Specifically, the JFM team and Director Armament Sustainment Programme Management (DASPM) put the DACAS system through a characterization test to assess its ability to conduct Digitally Aided Fire Support (DAFS).

"We took our existing set of equipment and put it through a different test protocol to explore what else it was capable of," explained Captain Aaron Brideau, the deputy project director for JFM.

Bold Quest is a multinational joint fires interoperability demonstration sponsored by the United States Joint Staff that attracts NATO and Pacific theatre partners to test the limits of coalition interoperability with capabilities in development or on the verge of being fielded. That coalition context is essential for proving the viability of DACAS, noted Brideau. "It's one thing to test in your own national sphere, but it's another to be correctly exchanging information digitally with other nations."

The event is both a large experimental testbed and a series of smaller sandboxes connected by developmental threads. For the Canadian Army team, the DACAS thread provided the opportunity to continue the evolution of DACAS capability for JTACs and evaluate a new communications waveform called SATURN (Second generation Anti-jam Tactical Ultra high-frequency Radio for NATO) they have been testing over the past year.

Part of the JFM project interest in the Joint Fire Support Joint Mission thread was on Artillery

Systems Cooperation Activities (ASCA) software that will allow NATO artillery headquarters to communicate with one another with standardized digital message exchange. But the team's primary interest was testing the variable message format (VMF) used for close air support in a different context – as a tool for a forward observer to communicate with an artillery command and control (C2) node to execute surface-to-surface fire support using already fielded combat net radios.

The test was conducted against what is known as DAFS Engineering Change Proposal 1 (ECP 1), a first step to prove or disprove the software's ability to conduct a standard area neutralization fire mission. Done in an ECP laboratory, the DACAS tactical equipment and an allied fire support C2 node exchanged information, with a protocol analyzer acting as a third party to collect all digital radio traffic. This ensured that the call for fire messages reach their intended destination, and nothing was lost or altered along the way.

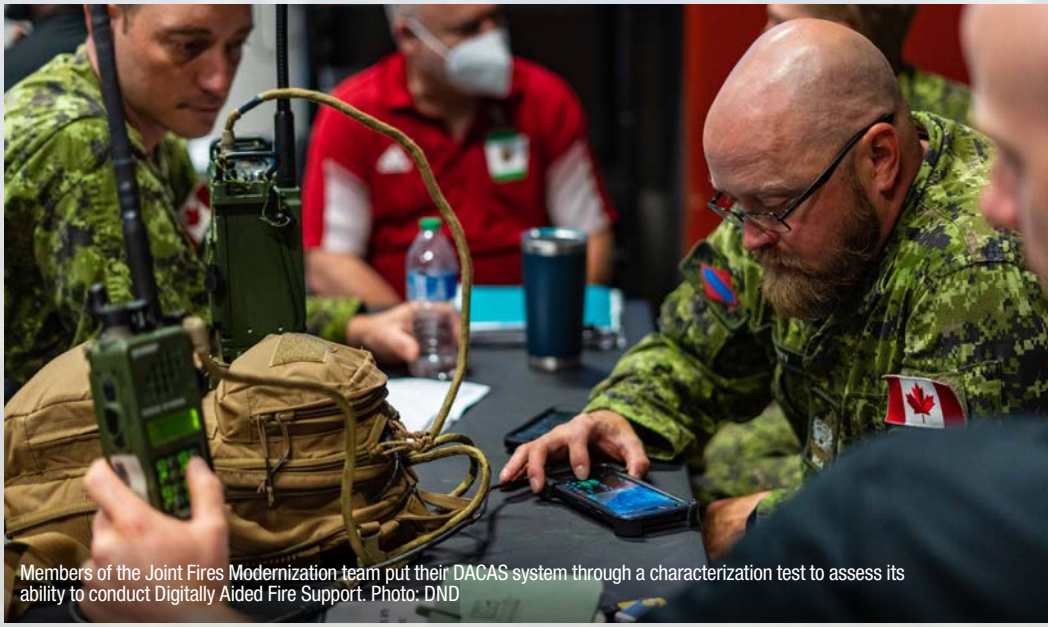
Photo: DND

"There is a standardized protocol you are tested against with all sorts of niche information in there to make sure grid coordinates don't slip or bearings don't change," Brideau explained. "Depending on the way the message standard is implemented, there can be problems."

He cautioned that the ECP 1 is not a compliance test with pass or fail. Called a characterization test, the evaluation is more of an investigative tool to put a system through a testing protocol and return a number of findings. The JFM project has not yet received formal results, but the DACAS system performed "as we would have hoped," said Brideau, a qualified JTAC and forward observation officer (FOO) who has worked extensively with the parachute company of the 3rd Battalion, Princess Patricia's Canadian Light Infantry.

"Information was being relayed correctly. The way it looked when it was received was the same way it looked when it was sent. And no major issues were discovered. With any testing protocol there are little things you find that warrant investigation for future improvement of the capability, but the existing equipment is clearly capable of executing a basic call for fire from an observer to a C2 node."

When Bold Quest 2023 takes place next summer in Hawaii, the JFM team intends to provide the application to forward observers on a U.S. Marine Corps exercise called Island Marauder to gather further feedback on how it behaves in a training environment and what FOOs like and don't like about it to help inform the requirements for the eventual solution that JFM will procure.



Members of the Joint Fires Modernization team put their DACAS system through a characterization test to assess its ability to conduct Digitally Aided Fire Support. Photo: DND

The intended outcome of the wide-ranging JFM project, which is currently in options analysis and on the verge of entering the definition phase, is a digital call for fire that would network forward observers to any shooter on the ground, in the air or at sea. DACAS has delivered a foundational piece for JTACs to connect with aircraft; the experiments at Bold Quest are confirming another piece – interoperable digital communications to conduct surface-to-surface fire support.

"We wanted to push the limits of the existing capability with a view to refining the operational requirements that we'll use for the JFM solution down the road," Brideau added.

As part of the VMF thread, the Canadian team then stepped out of the ECP Lab and into the multinational test environment to run "mission threads" with other nations, successfully exchanging digital calls for fire with U.S., Australian and New Zealand command and control systems. The value of those trials was not just proving technical interoperability, Brideau emphasized, but also identifying improvements for the user interface. Fire support calls, whether from air or ground assets, are often made under extreme stress and fatigue when motor skills are possibly impaired and cognitive function is overburdened.

"How does the user interact with that application and how can it become easier, less of encumbrance? How many taps does it take to get rounds down range? We're looking for subtle things that can streamline the user experience," he explained.

Though the Canadian contingent in the Joint Fire Support Joint Mission thread was sizeable – around 10 at times – he suggested more elements of the Army might benefit from Bold Quest writ large. Other events include threads dedicated to C4ISR, cyber and ground command and control, many of which are being woven together as the U.S. military builds out its Joint All Domain Command and Control (JADC2) concept. "The value density of Bold Quest is very high," said Brideau. ■

INTEGRATING THE BIG GUNS

ADDING THE CANADIAN M777 TO A LARGE MULTINATIONAL BATTLE GROUP HAS FORCED ADAPTATION OF ARTILLERY DOCTRINE.

By Chris Thatcher

In the wake of Russia's invasion of Crimea in 2014, NATO allies responded with the formation of enhanced Forward Presence (eFP) Battle Groups in eastern Europe as one of several deterrence measures. The Canadian-led battle group in Latvia stood up in June 2017 and consisted of combat elements from five partners – Albania, Italy, Poland, Slovenia, and Spain.

Five years on, the multinational formation attached to a Latvian Land Forces mechanized infantry brigade has grown to 10 nations, including the Czech Republic, Montenegro, North Macedonia, and Slovakia, and is now also working alongside a Danish battalion.

The Canadian Armed Forces (CAF) contingent of about 700 is currently led by 3rd Canadian Division, primarily drawn from the 2nd Battalion, Princess Patricia's Canadian Light Infantry (2 PPCLI), and includes a mechanized infantry company, a combat support company, and a combat service support company, as well as reconnaissance and armoured elements from the Lord Strathcona's Horse (Royal Canadians), M777 Howitzers and forward observers from the 1st Regiment, Royal Canadian Horse Artillery (1 RCHA), and other specialists from across the CAF.

As the battle group has grown, incorporating new or additional capabilities has presented a challenge at times. Commanders have managed the language barrier with liaison officers and embeds and

overcome most technical difficulties, especially with disparate communication systems. Combining doctrine and TTPs (techniques, tactics, and procedures), however, has taken a bit more work.

Last spring, the Canadian government added a M777 artillery battery of about 120 personnel to its combat mix, along with a Canadian fire support coordination centre (FSCC) able to provide unified command and control (C2) of the brigade's fires assets and plug into the Latvian infantry brigade.

Around the same time, Spain deployed a slightly smaller artillery battery with the self-propelled 155/52 light howitzer. The two joined the guns already fielded by Slovakian and Slovenian artillery units.

"It is not as much a capability change for fire power as a capacity change – just more guns," said Lieutenant-Colonel Jesse van Eijk, the battle group commander and commanding officer of 2 PPCLI. Rather, the challenge has been knitting together Commonwealth and NATO fires doctrine – how each employs forward observation officers (FOO) and various artillery elements – and how best to conduct C2, "so that a Slovak FOO attached to a Polish tank company with a Canadian platoon embedded in it, is able to call for fires through a joint Canadian-Slovak FSCC and then have another joint fires coordination centre send the missions to the guns."

Since neither Slovakia nor Slovenia are

Opposite, members of the Canadian artillery battery fire the M777 during an exercise in July in the Camp Adazi training area in Latvia while, pictured and above, the Canadian guns work with Slovakian Zuzana 2 155mm howitzers, American Paladin M109A6s and Spanish M109s during an integration exercise in September. Photos: Sgt1 Jesús Aguilera and DND

traditional partners, learning each other's technical procedures was the first issue to address, said Major Matt Stickland, a 1 RCHA battery commander who also serves as fires advisor to the battle group.

"It has been a challenge to make sure we have a common understanding. While there are NATO TTPs and STANAGS (standardization agreements) for everything we do within the artillery, sometimes the interpretation of these by different counties in their language makes a difference," he said. "With artillery, those differences in procedures when you are shooting a round 20 kilometres down range can have a big impact on making sure that round lands on target."

Both NATO countries as well as Spain have adopted a U.S. centralized structure for artillery C2, he said, "that adds some complexity for the soldiers on that fire mission. Canadian forward observers are trained to order fire. Here, within the NATO content, every call for fire is a request for fire."

That can mean operating within a very "prescribed context," with detailed orders for when a battery can engage targets. Canadian artillery units are trained to support manoeuvre elements and advise how to achieve objectives with fires. "We want to be able to give our manoeuvre arms the freedom of manoeuvre and we will ensure that we are able to provide them with what they need from artillery to allow them to achieve their goal – if you want to do X, this is what we can do to make sure you are able to achieve your goal," Stickland explained. The challenge has been adapting that to a more centralized process essential to "ensuring we can still employ these other artillery batteries to their fullest capability, because they really enhance our capability as an artillery group. Their self-propelled artillery can employ the shoot-and-move doctrine that we can't do very well as towed artillery."

Canada may be the battle group lead, but units like the artillery battery are modifying their approach to mesh with others, rather than setting the standards. "We are trying to pick and choose and we're getting the best parts of both doctrines. The Slovakians and the Spanish have much better training and employment of artillery to allow for survivability on today's modern battlefield," he noted. "That centralized control of artillery … definitely enhances the survivability of an artillery battery. We are trying to take those things, fit them within our TTPs that we are developing here, but still be cognizant that we must provide fires to support troops on the ground."

"This is something we are seeing across the battle group," added van Eijk. "We are not here to turn all these countries into a Canadian battle group. We [want] to find how we can most effectively work together and get the best out of everybody because we are not going to change the way all these countries operate, nor should we try to."

In fact, the best practices of others could significantly inform the Indirect Fire Modernization project that has emphasized agility as it seeks a platform to eventually replace the M777. "We have learned an immense amount that we are going to take back," said Stickland. "A lot of the TTPs and doctrine employed by [our partners here] is of immense value

Gunners prepare the M777 during an exercise in July with American Paladin M109A6s. Photo: DND

to us and we are making sure we capture those lessons."

KEEPING IT REAL

When the standard operating procedures (SOP) were first drafted for the multinational battle group, the six original nations and Latvia took a collaborative approach to finding common ground on 64 SOPs on everything from communications to personnel policy, fire support, and logistics. That led to a detailed integration plan for the first Canadian rotation to deploy.

Van Eijk, who has served in 1 and 2 PPCLI, commanded a rotation in Afghanistan, and instructed at the Infantry School in Gagetown, acknowledged a personal "learning curve" as he adapted to how other countries operate. He will adapt "the way I am going to do business" to the plans partner commanders brief to him, he explained, or tell them, "I need you to operate slightly differently for this phase or this operation because I do not have the ability to provide that centralized command and control, especially with the size of the battle group right now."

Because of the size and structure of the battle group, including some of the engineering and fires assets that might normally be commanded from a higher level, command posts "are bigger than a Canadian battle group would be, and our Combat Service Support (CSS) organization is very large."

Training exercises are designed with that larger structure in mind. Rather than develop "contrived scenarios" that attempt to write in every element of the battle group and end up "teaching bad lessons because they make no tactical sense," training is more targeted, identifying specific primary elements to exercise and "finding a way to provide value to everybody else," he said.

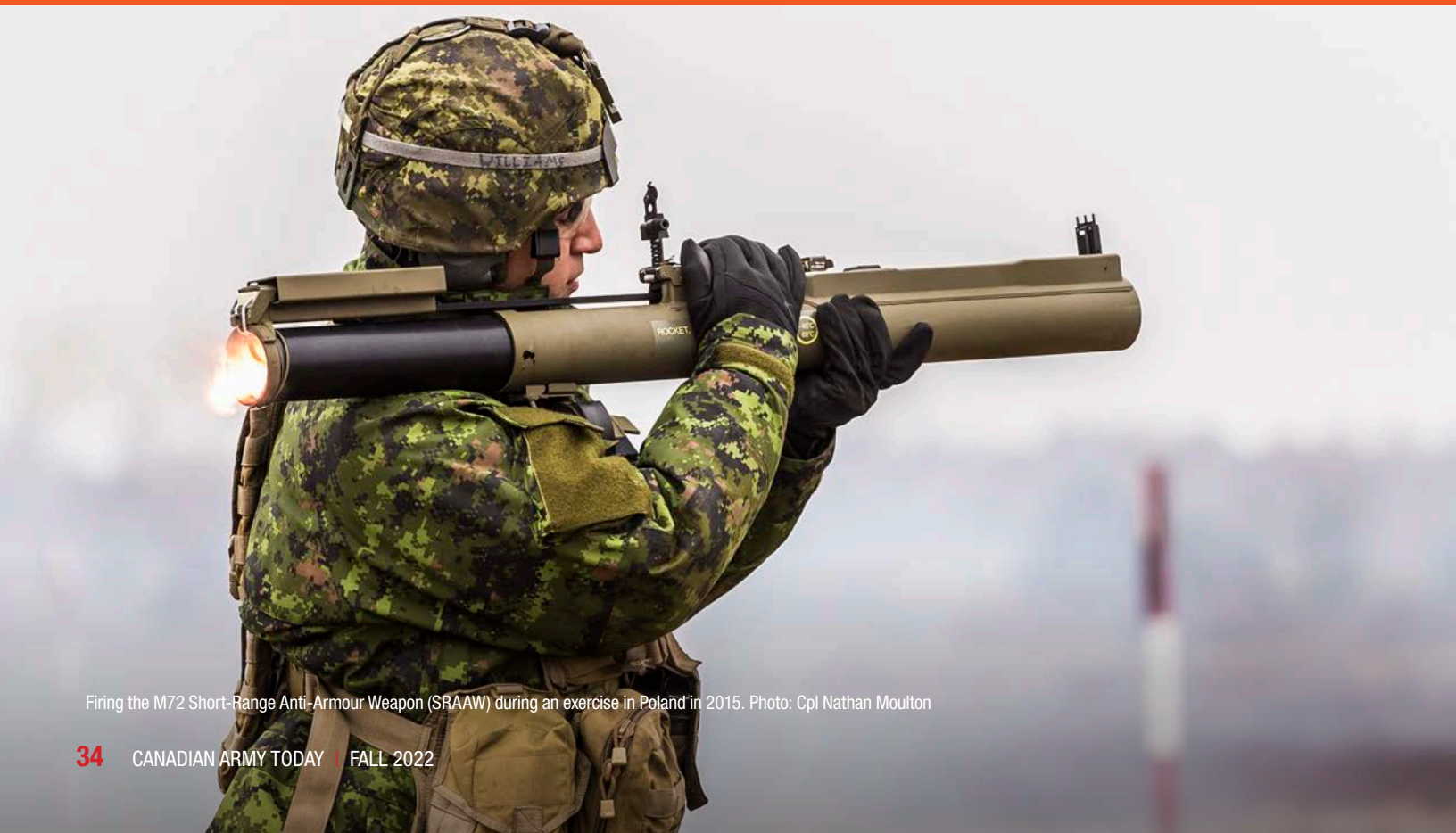
"We can take some of those specialists and utilize them in some of their secondary roles. Czech specialist pontoon bridging sappers at the end of the day are still sappers and they are perfectly happy doing standard sapper tasks and augmenting our Spanish-led engineering company. Other elements will go off and do their own thing in that time. Fires is a great example: On our first exercise, Rampart Forge, we really focused on the manoeuvre companies, so Matt went off with the guns to the flanks and worked on fires integration."

On Rampart Strike, a more recent exercise, the artillery was integrated "into the game a bit more," he said. "We identify the exercise objectives, figure out who we can properly exercise and then find a way to use those elements in the space we have," a training area that is far smaller than any in Canada.

Battle group exercises have always been conducted against a backdrop illuminated by Russian training or other activity in the region. Russia's invasion and ongoing war with Ukraine has heightened the importance of the battle group, but "I don't think our mindset has shifted much," said van Eijk as the battle group prepared for Exercise Silver Arrow, a brigade level interoperability exercise led by Latvia. "The mission hasn't changed in terms of the mission statement. The Russian focus is not right now on Latvia, but it does not preclude us from keeping an eye on what is happening on our flanks." ■

Live fire defensive training for candidates on the Basic Military Officer Qualification Army course in Gagetown in March 2019. Photo: Avr Justine Dusablon

More of the same



Firing the M72 Short-Range Anti-Armour Weapon (SRAAW) during an exercise in Poland in 2015. Photo: Cpl Nathan Moulton

The replacements for Carl Gustaf and M72 weapons sent to Ukraine could be more Carl Gs and M72s.

By Ken Pole

The brutal effectiveness of portable missile launchers against armoured vehicles has been graphically proven in Ukraine's resistance to Russia's invasion almost from the day it began last February. Gutted by Ukrainian troops using mostly munitions donated by Canada and other countries, hundreds of main battle tanks (MBTs) litter roads and highways like so many giant beetle carcasses.

Russian losses were staggering even before Ukraine mounted twin counter offensives in the eastern regions bordering Russia this fall. Western analysts say 1,392 tanks had been attacked by mid-October, 801 of which were destroyed. An average of 10 a day were being destroyed at one point compared with two a day on the Ukrainian side.

The loss of relatively modern T-72, T-80 and T-90 MBTs as well as thousands of armoured personnel carriers compelled Russia to deploy older T-62 MBTs out of storage. The later platforms were essentially evolutions of the decades-old T-62s with the same tactical vulnerability: Internal ammunition storage which resulted in spectacular "Jack in the box" explosions caused by shoulder-launched missiles.

While it's impossible at this juncture to say precisely how much of that element of the Ukrainian arsenal involved Canada's donations of two types of portable missile systems, they have inarguably been a key factor together with similar weapons donated by Britain, the United States and other allies.

Russia's "special military operation" was only days old when Canada confirmed that it had donated "at least" 100 Carl Gustaf M2 line-of-sight recoilless rifles made by Saab Bofors Dynamics in Sweden. In service with the Canadian Army since the mid-1960s, the reloadable M2 system is used by Reserve units while newer and slightly lighter M3s are employed by the Regular forces. A disposable single-shot smooth-bore A4 variant developed in 1984 is used by Canadian Special Operations Forces and an even lighter M4, which can be carried with a round loaded, has been available since 2014.

The M2s were shipped to Ukraine with 2,000 rounds of 84-millimetre ammunition. Canada's combat inventory includes high-explosive anti-tank (HEAT) rounds with an effective range of 700 metres and "dual-purpose" rounds, which can destroy fortified positions out to 500m. The M4 can hit stationary targets at up to 1.2 kilometres, but there's talk of pushing its range to 2km.

At the same time, Canada shipped some 4,500 M72A5-C1 rocket launchers, also line-of-sight weapons. Now manufactured in the U.S., Norway and Turkey, the M72 has been in Canadian Army service since the late 1960s. A simpler single-shot disposable short-range weapon, it fires a 66mm shaped-charge warhead capable of penetrating up to 35 centimetres of armour.

Unit costs (all U.S. dollars) for the more sophisticated Carl Gustav are published at $20,000 for the launcher and $550 to $3,000 for the missile, depending on the model, while an M72 ranges from about $750 to more than three time that, again depending on the model.

The Department of National Defence (DND) is understandably reticent about how many of those weapons and their ammunition remain in inventory, but a paper published by the Canadian Forces College in 2016 stated that the Army had approximately 1,100 Carl Gustafs in service. Nowadays, DND would only say that there is "enough ammunition stock" and it is "working closely with industry and with our partners at Public Services and Procurement Canada... to examine options to replenish our stocks."

The Army has had a replacement project in its recapitalization plans for several years, augmenting it with a recent proposal for a new multi-purpose, anti-armour and anti-structure, portable and mounted weapon system (see the Spring 2022 issue for more on the project). Since development costs of that kind of weapon can easily run into the hundreds of millions of dollars, procurement of an existing system would be the most cost-effective approach for the Army.

That begs the question: What could replace the Carl Gustafs and M72s if the Army is to retain both short- and medium-range capabilities? (Long-range attacks up to 30 kilometres are delivered in part by the 155mm M777 towed howitzers; Canada has donated several to Ukrainian with great effect.)

DND spokesperson Jessica Lamirande confirmed in late October that the Army plans to replace the M72s and the Carl Gustaf systems and their munitions – as well as the howitzers, hand grenades, demining equipment and thousands of .338mm Lapua Magnum rounds of ammunition for the undisclosed number of medium-range C-14 Timberwolf sniper rifles supplied by PGW Defence Technologies of Winnipeg in 2005.

Neither the rifles nor the howitzers will be coming back. The Army has begun to take delivery of more modern sniper rifles (see p 10) but the big guns are no longer manufactured by BAE Systems.

"Plans to replace some of the more recent donations are still being developed," said Lamirande. "Some of this equipment will be acquired through the Munition Supply Program (MSP), others through the regular procurement process. Some of the ammunition will also be replaced as part of the annual replenishment process under the MSP, by increasing our order amount over the next 24-48 months. Given the Carl Gustaf M2 model is now obsolete, we'll be looking at developing the acquisition solution for the M4 (and) plans are to replace all other equipment with the same models."

DND was still "exploring options" for new howitzers. Lamirande said those include standing up a new project for a full replacement, exploring the market for surplus M777s, which BAE also sold to allies such as Australia and the U.S., or potentially buying a new capability.

BAE Systems is considering restarting production of the M777 howitzer. BAE said if inquiries from the U.S. and Central European countries translate into orders, it could lead to production of 500 new guns. But restarting the full production could take 30 to 36 months. Mark Signorelli, BAE's vice-president of business development, told *The Wall Street Journal* that the company needs an order of at least 150 to reboot production "profitably."

The M4 is a "the Swiss Army Knife of weapons, the multi-tool you always want to have on hand," Sierra Fullerton, a Saab spokesperson, said in response to a request for details about potential options for the Army. The Carl Gustaf system "remains a key tool in the ground combat arsenal" and Saab continues "to support [Canada] in ensuring the armed forces have the equipment and munitions required."

The weapon's ease of use is one of its biggest strengths, she agreed. "It is also highly portable and provides great flexibility with a large number of different munitions for different use cases."

As for the Army's financial bottom line, familiarity with the "Carl G" means it will not require time-consuming and expensive retraining. There's also its "backwards compatibility with the legacy models," she pointed out. "We believe its continued popularity is a testament to the ongoing relevance and reliability." The M4 is half the weight of the M2, and it supports intelligent fire control and programmable ammunition.

There are other options capable of hitting air and ground targets at far greater ranges, but it's apparent DND also believes that sticking with tried-and-true equipment, including the M72, is the preferable solution. ■

Taking on the Tanks

With peer adversaries invested in heavy armour, the Army needs better portable anti-tank capabilities

By Kevin Wang and HengLiang Wu

A member of 1 RCR B Company fires the M72 rocket launcher at insurgents during Operation Topak Shkar (Pashtu for "Gun Hunter") in the Panjwa'i District in 2010. Photo: Sgt Daren Kraus

Recent combat experiences in Ukraine have shown that portable anti-tank weaponry gives infantry a chance to fight against armoured targets, which are immune to rifles and grenades. The large variety of such weapons can be divided into two categories: Rockets and missiles. The Canadian Army is no stranger to these weapons, as they have long been used. However, due to a change in NATO doctrine emphasizing air- and armour-based anti-tank capabilities and federal budgetary issues, training and procurement of infantry-based anti-tank capabilities have fallen behind, especially for Reservists. It would be detrimental for an infantry unit to face enemy main battle tanks (MBT) without the right weapons. Hence, sufficient capabilities in this regard are required for all infantry units of the Army.

Equipment

Three types of portable anti-tank weapons are currently in service with the Army: The Carl Gustaf recoilless rifle, M72 LAW rocket propelled grenade (RPG) launcher, and the BGM-71 TOW wire guided missile. The Carl Gustaf M2 recoilless rifles are mainly used by Reservists, while the M3 rifles, with lighter weight and strengthened structure, are used by the Regular units.

	Carl Gustaf	LAW	TOW
Range against vehicles (m)	350-400	200-220	3750
Speed (m/s)	230-255	145	278-320
Penetration (mm RHA)	Up to 500 depending on ammunition	Up to 300 depending on ammunition	430-900 depending on model
Tracking	n/a	n/a	Optical
Guidance	None or laser (GMM munition)	n/a	Wire
Mode of attack	Front	Front	Front
Country of origin	Sweden	United States	United States
Years of design	1964 (M2), 1986 (M3)	1959	1960s

Though these three types of weaponry all possess some degree of anti-tank capabilities, their effectiveness varies wildly. The M72 LAW, a light RPG launcher, is not meant to be used against any armoured vehicle with more protection than a Russian BMD. Its penetration and range are highly limited unless used at very close range such as an ambush or in urban warfare, which would severely reduce the survivability of the grenadier.

Furthermore, the M72 LAW's low projectile speed means that it could be prone to interception by active protection systems such as the GL5, currently mounted on the Chinese VT4 MBTs.

In comparison, the Carl Gustaf recoilless rifle provides a better chance at penetrating armour, but still falls short against the front armour of modern MBTs with composite designs. Furthermore, its short range would still require the grenadier to penetrate the defence of enemy light vehicles to attack the intended target, which would usually be a fatal endeavour. Hence, it is safe to conclude that these two types of weapons are generally not suited to anti-tank purposes.

Lastly, the TOW anti-tank missile is the weapon of choice when dealing with an enemy MBT. It has much further range and penetration power, which are the two most important aspects of infantry anti-armour warfare. However, its design no longer keeps up with the latest technology as it does not have fire-and-forget capabilities and is not capable of top-attack options. The small number of launchers possessed by the Army means that it would be nearly impossible to provide all mobilized infantry units in an armed conflict with this kind of protection.

Hence, one of the major procurement priorities of the Royal Canadian Infantry Corps is to acquire a sizable amount of portable long-range high penetration anti-tank missiles. Ideally, every battalion should have a specialized anti-tank platoon capable of operating these missiles, supplemented by existing Carl Gustaf recoilless rifles and M72 LAW launchers.

Training

Since the end of the Cold War, the training emphasis of the Canadian infantry soldiers has shifted much towards combat against lightly armed adversaries. Skills regarding anti-tank weapons that were once highly regarded in previous decades were largely lost. It has been demonstrated in military training missions in Ukraine in the past years that Canadian soldiers were highly deficient in this experience and had to draw on service personnel from the Cold War era to help with teaching. Given an increasing likelihood of state-sponsored warfare, this could leave Canadians on the frontline in jeopardy facing tanks with rifles and grenades.

In addition, potential adversaries have large numbers of tanks and heavily armoured vehicles, and their preferred land combat tactics involve a high dependency on deep armour penetration. Furthermore, many European NATO allies have reduced their armour corps to an alarming extent, either equipping their armies with obsolete or few operational tanks.

Consequently, infantry training should consider adopting several routes simultaneously. Firstly, introductory anti-tank lessons should be given in basic training to all members of the Army, including Reservists. This helps ensure that no one in future combat would make obvious tactical mistakes under a stressful situation of being attacked by an armour formation.

Secondly, non-armour combat personnel should learn the basic method of anti-tank tactics not involving special weapons, such as the construction of a makeshift tank trap. Thirdly, infantry anti-tank platoons should be equipped with anti-tank missiles and be taught in using them. If training capabilities allow, others should also learn these skills.

Lastly, it could be helpful to invite members of infantry corps from friendly nations that have been in anti-armour combat in recent years to showcase the latest knowledge in this area.

It is clear that Canadian infantry personnel are not properly equipped and lack training and experience for anti-tank warfare. This major operational deficiency must be plugged before the next high intensity combat operation. If not, we face the prospect of a high number of casualties and encirclements and complete destruction of formed units by enemy armour columns. Should the national defence budget be increased in light of the war in Ukraine, addressing this issue should be a priority for the Canadian Army. ■

Kevin Wang is a recent engineering graduate at Imperial College London in the United Kingdom. HengLiang Wu is studying at Western University.

Electronic Warfare Effects

For 21 EW Regiment, the first task is explaining what they do

By Ian Coutts

In the world of electromagnetic warfare, what you can't see can definitely hurt you. Wherever we are in the world today – this includes our own homes as well as in the modern battlespace – we are immersed in a bath of electromagnetic radiation. From the perspective of electromagnetic warfare, that includes everything from microwaves to low frequency radio waves. Radios, wi-fi systems, satellite navigation tools, even modern watches, all emit signals – and those signals can be discovered, tracked, disrupted, and blocked by an adversary.

Making sure what we can't see in the electromagnetic warfare sphere can't hurt us – and using the same electromagnetic warfare tools to help us – is the job of the 21 Electronic Warfare Regiment.

Founded in 2010, but with a pedigree that stretches back right to the Special Wireless, or Y units, of the First and Second World Wars, most people, in the military and outside of it, don't know much about the Kingston-based unit. That may be in part because electronic warfare (EW) is a slippery concept to grasp. It may also be because what they are dealing with is, at the end of the day,

A Light Utility Vehicle Wheeled (LUVW) G-Wagon during 21 EW's annual verification exercises in the fall of 2021. Photo: MCpl Robert Lowe

A Bison EW vehicle. Photo: DND

2 Electronic Warfare Squadron and 772 EW Squadron (Reserve) mark the 9th anniversary of their amalgamation into 21 EW Regt in 2019. Photo: DND

something most of us are not normally aware of. And it may be that given the nature of their work, they deliberately maintain a low profile.

But not too low, as Captain Eric Brisebois, the regiment's training officer, admits. "If they [combat arms] don't know what we do, how can they use us?"

That's part of the reason why he has agreed to speak with me this day in late September, in the secure buildings they work from in a corner of CFB Kingston.

Simply put, the regiment has three roles: Electronic attack, electronic protection, and electronic support. Attack is essentially doing unto others in the electromagnetic sphere. Protection is stopping them from doing unto you. Electronic support, says Brisebois, "is our bread and butter. That entails "collecting information which has strategic or tactical value." Information understood in terms of the electro-magnetic spectrum, where the nature of the signal can tell a trained operator as much as the content of the message sent. "If there is a platoon hiding in the woods, and if we can pick up their signal, it could tell me where they are and their possible intent" – even if they can't read the transmission content, Brisebois explains by way of example.

These days the regiment is kept particularly busy in Latvia as part of a NATO multinational battle group. Brisebois has just returned from a six-month tour, where he was serving as an Electronic Warfare Liaison Officer (EWLO) between the Canadian-led enhanced Forward Presence Battle Group, Canadian Joint Operations Command, and 21 EW Regiment.

The unit's presence in Latvia is an acknowledgment of the direction Russian military thinking has taken in recent years. "Russia has had a roadmap since 2008 that they want electronic warfare to be a part of their combat teams," Brisebois explains, "and they have pushed a lot of money in there. Russia has acknowledged EW and its potential as a force multiplier."

To combat that, even theoretically, requires the same capability. A key part of the regiment's work in Latvia has been education – for NATO allies, other elements within Canadian Armed Forces, and even other units of the Canadian Army.

"We're a small unit," he says, "and we can't always travel to Edmonton or Petawawa or Valcartier and work with units there." The time in Latvia has been a great chance to work alongside different units from across the country. "This might be the first time a particular group has had EW units" working with them and teaching them the language of EW so that they can work better together.

Latvia will occupy the regiment's efforts for the foreseeable future. Having a troop deployed with another preparing to go puts a lot of strain on a relatively small unit of just two Regular EW squadrons and, unique in the Canadian Army, an embedded Reserve squadron that provides individual augmentees. At the time we spoke, they were getting ready to send out another troop, the fourth in recent years to serve on Op Reassurance.

In the future, too, they'll be playing an important role in the new combat support teams (CSTs) that the 6th Canadian Combat Support Brigade (CCSB) began trialing in 2018. These will consist

of elements drawn from CCSB's constituent units – Canadian Army Intelligence Regiment, 4th Artillery Regiment (General Support), 4 Engineer Support Regiment, Influence Activities Task Force, and 21 EW – whose disparate skills and equipment are combined to create what Brisebois terms a "fused 'sense' function" to supplement a Canadian Mechanized Brigade Group. It is a more effective way to make use of capabilities the Army has but has not always exploited to the fullest.

"As part of the team, we could have an Electronic Warfare Coordination Centre, which could range from an officer or some other individual as a liaison officer. Or it could be a bigger element, depending on what's required. And then that element would write the orders for the troops and provide the tasks," he says. The CSTs would not be permanent formations but could be "task tailored" when needed.

The Army has already experimented with the CST concept on Exercise Maple Resolve and at other major training events to see how it works in practice. During the time that he was in Latvia, Brisebois talked up the CST across "the battle group, the division and the corps." Once the Army approves the concept, the next step will be to formalize CSTs, which will allow more of the Army to take advantage of 21 EW's skills and technology. In the meanwhile, the regiment will be doing its best to get the word out about EW. "If we don't educate and promote our capabilities, they will not be able to employ us or be interested in us joining them," says Brisebois. ■

A Coyote surveillance vehicle during winter training. Photo: DND

Photo: Cpl Jaclyn Buell

Army Assists with Hurricane Recovery

By Tim Dunne

Fiona – the feminine musicality of the name belies the ferocity of the tempest that carried its name. Derived from the Gaelic word fionn, meaning white or fair, it struck Atlantic Canada with the merciless force that shocked its victims, hardy people who are well-accustomed to enduring storms and heavy seas.

Hurricane *Fiona* made landfall as a post tropical storm on Sept. 24, along Nova Scotia's eastern shore, Prince Edward Island and Newfoundland and Labrador's west coast. The hurricane dumped record-breaking heavy rainfall, with damaging winds that toppled trees, ripped electrical wires, and tore roofs from homes and buildings; and with massive waves that washed homes into the sea. Wharfs were destroyed and buildings were pounded into broken lumber and driftwood.

As the storm passed, Atlantic Canadians left homeless or with damaged homes tried to reconstruct their residences, accumulate family memorabilia and photos scattered throughout the storm area, and put their lives and their families back together.

Fiona replaced hurricane *Juan* of 2003 as the most memorable weather event of Atlantic Canada as the easternmost provinces called for military assistance to help them recover from *Fiona's* body blows.

Under the umbrella of Operation Lentus, the Canadian Armed Forces' (CAF) response to natural disasters in Canada, members lent their unique capabilities to serving alongside provincial, territorial, municipal and private sector partners from Sept. 25 to Oct 8. Canadian soldiers, sailors and aviators assisted the province and its residents in conducting physical impact assessments, safety checks to ensure the well-being of affected residents, and assisting with the removal of debris on land and in the water.

Three hundred soldiers were the CAF's immediate contribution, distributed

4 Engineer Support Regiment deployed LAVs to help clear roads on Prince Edward Island. Photo: Cpl Jaclyn Buell

throughout the affected areas. This cadre quickly grew.

The type of destruction varied, not just from province to province, but frequently from community to community and street to street, requiring an unusually high degree of flexibility from all respondents, military and civilian.

Newfoundland and Labrador

The television news images shocked viewers. Rubbled houses dotted the rocky shoreline of Port aux Basques, with their contents, from furniture to photographs and family memorabilia, littering the shoreline. Traumatized local residents recovered what they could find of the family possessions and treasures that hadn't been blown out to sea.


In Nova Scotia, members help fill sandbags to hold back water. Photo: Cpl Simon Arcand

The Sept. 25 approval of Newfoundland and Labrador's request for assistance, sent members from 5th Canadian Division, 37 Canadian Brigade Group Direct Response Company, HMCS *Margaret Brooke*, and about 50 Canadian Rangers to respond. Within two days, the ship's company sent assessment teams to the communities of Francois, Grey River, Burgeo, Ramea and La Poile to assess damage and conduct wellness checks on people and families in the area.

CAF personnel worked with federal, provincial, and municipal partners including Newfoundland and Labrador Emergency Services Division, the Department of Justice and Public Safety, the Department of Transportation and Infrastructure and Marine Atlantic. The Newfoundland and Labrador portion successfully concluded on Oct. 8.

Prince Edward Island

As with other areas of Atlantic Canada, *Fiona* hit Prince Edward Island's power grid, making military assistance in the removal of vegetation and debris from roadways, streets and highways essential to the Island's Department of Transportation and Infrastructure in the restoration of the power grid.

About 160 CAF members from 4 Engineer Support Regiment from CFB

A CAF member conducts damage assessments of homes in Channel Port aux Basques, Newfoundland. Photo: Cpl Braden Trudeau

Gagetown and members of the Primary Reserve answered the call to assist recovery efforts, working with Maritime Electric, Health PEI, the province's Emergency Measures Organization, the Department of Transportation and Infrastructure, and Team Rubicon until Oct. 16.

Nova Scotia

From Sept. 25 to Oct. 13, troops assisted provincial recovery teams and residents to remove trees and debris to clear and open roadways, streets and highways, helping local line crews to restore power in affected areas.

"Starting at six a.m., Nova Scotia Power set up a base camp and within minutes, Nova Scotia Power repair vehicles and Army trucks started to arrive, and people got busy. In a very, real sense, we saw that the cavalry had arrived," one Sydney resident told *Canadian Army Today*.

At the peak of recovery efforts, there were about 750 personnel deployed in Nova Scotia working alongside Nova Scotia Emergency Management Office, Nova Scotia Public Safety Field Communications, Department of Public Works Nova Scotia and Nova Scotia Power.

Team Rubicon Canada, the veteran-led humanitarian organization that serves communities before, during, and after disasters and crisis, also contributed their efforts to the hurricane recovery in Nova Scotia.

"Post-tropical storm *Fiona* was the biggest and most devastating storm we've seen in recent memory," said Amanda McDougall, mayor of Cape Breton Regional Municipality. "More than 200 people were displaced from their homes, and hundreds if not thousands of properties were left with downed trees, … most taking down nearby power lines as they fell. The [CAF was] critical in helping to remove tree debris, in tandem with skilled workers from Nova Scotia Power as well as from across the country and the United States, in order to restore power and open up transportation routes. We are still in hurricane season and winter is around the corner, so I fear what would have happened had the military not provided the boots on the ground assistance it did in the face of dangerous and worsening conditions." ■

Clearing roadways in Nova Scotia. Photo: Cpl Connor Bennett

A member of the force protection team eyes the treeline (inset) as Chinook and Griffon helicopter crews coordinate the landing: Photos: Chris Thatcher

Protection Detail

By Chris Thatcher

AS THE CURRENT CUSTODIANS OF FORCE PROTECTION FOR FORWARD AEROMEDICAL EVACUATION, 3 RCR ARE EXPERIMENTING WITH WAYS TO PROVIDE COMMAND AND CONTROL FROM ABOVE.

As two Bell CH-146 Griffon helicopters alternated high and low sweeps overhead, a CH-147F Chinook cleared the treeline and rapidly descended into a clearing. Its wheels touched the gravel just long enough for a medical team and four force protection soldiers to clear the rear ramp, then it was airborne again, circling away to avoid ground fire.

The force protection detail quickly took up positions facing a cluster of trees and dense scrub. A technical vehicle had been spotted on a nearby road by the Griffons as they overflew the area on the route in and nobody was sure what lay within the forest. No sooner had the medics begun to treat four injured Dutch soldiers when gunfire erupted. The force protection team engaged, killing a half dozen members of a local militia who had struck the Dutch patrol earlier and were hoping to ambush the medical evacuation.

Once the medics had triaged the casualties and quickly prepped them for transport, the Chinook returned to the clearing while the Griffon established a protective hover. The force protection team helped load the patients, and the helicopter rapidly ascended away from any further ground fire. Onboard, the medical team of a flight surgeon, critical care nursing officer, and two aeromedical technicians went to work, assisted by the four infantry soldiers, to provide life-saving care, often communicating vital signs and other critical information with hand signals and notes on a grease pad, while the loadmaster and two door gunners maintained a watchful eye for activity below the aircraft.

The dynamic scenario was part of a validation exercise for the Canadian Medical Emergency Response Team (CMERT), held this past spring in the Petawawa training area at the end of a two-week course for the medical and force protection personnel, working alongside aircrews from 450 and 438 Tactical Helicopter Squadrons.

Forward aeromedical evacuation was developed and deployed to support the United Nations peacekeeping mission in Mali in August 2018. Over 12 months, teams of Chinook and Griffon crews, medical personnel, and force protection soldiers from the 3rd Battalion of the Royal 22e Regiment conducted 11 major medical flights involving over 40 patients under often difficult conditions. The success of the capability prompted a directive from the Vice Chief of the Defence Staff to make CMERT "an enduring capability."

While 1 Wing Kingston holds responsibility for the overarching CMERT capability integration and 426 Transport Training Squadron is responsible for the training plan, the 3rd Battalion of the Royal Canadian Regiment (3 RCR) has been tasked with maintaining the force protection capability for at least the current year.

Since the Van Doos first stood up the capability of soldiers working simultaneously as a force protection detail and medical practitioners, responsibility for maintaining it has been passed among infantry units within the Army's three mechanized brigade groups. When Oscar Company, 3 RCR, received the tasking, Captain Drew MacDonald-Wangen decided to experiment with how the force protection team was commanded.

Rather than depend solely on a command element from among the non-commissioned members on the detail, he opted to test a "role for the platoon command team within the scope of a potential CMERT mission. Rather than sitting on the sidelines and doing the administration for the team – sourcing ammunition, paperwork and coordination – I was looking for ways to involve myself and my platoon 2IC (second in command) in the actual mission if possible."

During the validation exercise, as the force protection teams worked with their medical partners in the back of the Chinooks, MacDonald-Wangen took a seat in one of the Griffons to trial various command and control (C2) concepts to integrate an infantry perspective into the air picture.

From the escort helicopter, he tested different ways of relaying relevant information to the ground team that might not have always been apparent to tactical aviation pilots focused on flying the aircraft. While he had no direct command of their mission,

he was able to share relatable details on ground elements such as the technical vehicles.

Griffon pilots, though used to working with the Army, "see things from 1,000 feet off of the ground," he noted. "When you are up 1,000 feet it is more of a 2D picture. I was better able to put myself at ground level and see the 3D picture and how things might be influencing [the force protection detail]. To an Air Force pilot, a vehicle with a mounted machine gun acting as a technical may be a direct threat if it is moving toward the aircraft or in the general area. But I'm looking at how fast the vehicle is going and whether it can move to the point of injury and how long it will take for my team to form a defensive posture or prepare the casualties to be evacuated before the technical gets there. That was where we saw the big change."

What and how an infantry officer conveys information is noticeably different, too, said Sergeant Adam Spencer, one of Oscar company's section commanders.

"The differences were pretty big when it came to the type of information," he said. "It is a more infantry-centric picture for us on the ground. And in the most basic language that I can understand. It worked out a lot better [and] I think a lot of the pilots took aboard a lot of the stuff he was passing on and said, 'Maybe we should talk like that.'"

The CMERT role has been a constant evolution for the Army, MacDonald-Wangen noted, and the C2 component will be no different. The validation exercise proved the benefits of C2 from above, but it will have to be part of an "adaptable platform."

CMERT missions are often away from other supporting elements, "so the idea was to add a command-and-control element for the force protection personnel from within the team on any given mission." But because those missions are short-notice responses to a casualty, it might not always be possible or necessary to have a soldier's perspective from the escort helicopter. "Depending on the mission, it might not make sense to tag along if it doesn't require it. We're also developing the scaling of the troops that are a part of force protection, whether it can be scaled up or down depending on the security," he added.

A UNIQUE TASKING

For soldiers interested in the CMERT role, the Tactical Combat Casualty Care Course (TCCC) is a recommended perquisite, though not yet a requirement – 3 RCR would make it a necessary part of its pre-mission training if deployed because of the types of medical procedures the soldiers are asked to assist with, MacDonald-Wangen said. But beyond the validation exercise, CMERT does not require any specialized or enhanced infantry skills. "Our annual IBTS (individual battle task standards) training and

Members of 3 RCR's force protection team take up positions while medics treat a casualty. Photo: Cpl Melissa Gloude

battalion-led training will give them the skills and ability to do this tasking," he said.

Learning the medical terminology and how to use specialized equipment such as a pelvic binder is part of the CMERT course. But "any individual from the battalion could be pulled into the group and trained up quickly for the scheme of manoeuvre for the mission and be able to execute it with no problems," he noted. "If there is a mission, we have a plan for more focus on CMERT execution, but we wouldn't have to pick individuals based on specific training."

However, participation in CMERT has helped battalion members perform well on the TCCC and improved the overall understanding across the company of combat first aid. "It's improving the infantry's perspective on combat injuries," said Spencer, noting the decline in specialized medical training since Afghanistan. "We haven't focused on combat casualties like we used to, and I think we should incorporate a lot more into our training. The ripple effect from the exposure we have been getting by working with these doctors, nurses, and medics has been huge. Soldiers understand why a pelvic binder needs to be applied."

It's also having a noticeable effect on retention in the unit, he added. "This is something that everybody is super excited for. Who doesn't want to ride in a helicopter? There were guys trying to get onto the CMERT tasking while we were doing [the validation exercise]."

Soldiers often seek job satisfaction from something different and this "is something unique that takes in all our previously learned skills and tests them in a different way," said Macdonald-Wangen.

At present, 3 RCR holds the CMERT force protection responsibility until July 2023 – as well as a mandate for the Non-Combatant Evacuation Task Force. So far CMERT has been shared among the Army's mechanized brigade groups, but there is an argument to leave 3 RCR as the permanent custodians of the capability because of its working relationship with 450 Squadron, the lead mounting unit for CMERT.

"Because of proximity, it does make sense for us to hold this mandate because we are able to continually train with them year-round," said Macdonald-Wangen, noting the battalion already works with 450 Squadron to support the Basic Tactical Aircraft Control course twice each year.

But if the company does have to hand over the capability next year, they have been writing an aide memoire of sorts, a pocketbook adapting the lessons of their predecessors and their own experiences to pass on. "It will be a living document … [with] a lot of information," he said. "It's not yet an award-winning book, but it is a good baseline for others to be able to do [CMERT] off the hop." ■

Once on the Chinook helicopter, 3 RCR soldiers become part of the medical team. Photo: Cpl Melissa Gloude

Photo: 3 CRPG Public Affairs

COMMEMORATIVE VOYAGE

By Ian Coutts

Talk about a study in contrast. The location is the Davis Lock, one of the prettiest spots on the Rideau Canal system. Boaters heading upstream approach the lock through a deep cut in the rock, passing by a frothing waterfall. Just past the lock, upstream in a small inlet, sits a few little docks. On this pleasant September evening, one spot is occupied by one of those houseboats that tourists rent during the summer to explore the canal – it's essentially an aluminum trailer on pontoons. Right across from it on the same dock sits a large freighter canoe, painted a dull green and equipped with a powerful outboard motor. Nothing fancy about it, it's all business.

You don't expect that. Or the other eight similar canoes that are tied up here. But then, this isn't where you'd expect to find the Canadian Rangers, either. Their turf, if you will, is the north – James Bay, the High Arctic, northern Quebec. Not this lush stretch of eastern Ontario waterway.

They're travelling in these canoes from Parry Sound to Ottawa via the Trent Severn and Rideau Canal systems to mark the 75th anniversary of the founding of the Canadian Rangers back in 1947. Thirty-two members of the 3rd Canadian Ranger Patrol Group (3 CRPG) drawn from local units located in settlements on James and Hudson Bay and inland as well, along with Canadian Army elements from CFB Borden, left Parry Sound on Sept. 5 and will arrive in Ottawa 13 days later, on Sept. 17, where they'll take part in a ceremony at the National Aboriginal Veterans Monument to mark the founding of the Rangers.

They're camping here for the night, their little grey one-person tents scattered like mushrooms across the lawn next to the lock. No pleasure boater pulling in here would expect to arrive in what appears to be a military camp. But one thing you learn when you spend time with the Rangers: expect the unexpected.

"I brought my sofa cushions," says Sergeant Jocelyn "Jessie" Sutherland. We are hanging out on picnic benches beside the lock, waiting for dinner. As she explains why, you see the logic. The canoes that the Rangers are travelling in came from Fort Albany and Kashechewan First Nations, on James Bay. To get them far enough south that they could be loaded onto trucks at Calstock and driven the eight hours to Parry Sound, required motoring down the Albany, Kenogami and Kabinakagami rivers and on to Highway 11 – a 450-kilometer trip of five days' duration. That alone, would probably merit a sofa cushion if all you were doing was sitting, but that wasn't the case. Because the weather had been dry, the water was very shallow in places, as little as four inches deep, which meant getting in and out of the canoes repeatedly and dragging them through the shallows. Everyone ended up badly bruised, not least from scrambling in and out of the canoes. Sutherland developed her own technique for getting back into the boat – a sort of roll. In that case, it's easy to imagine that the sofa cushion was really a necessity.

Sutherland, a child welfare manager at home and a master's degree graduate of Ryerson (now Toronto Metropolitan) University, jumped at the chance to make the trip when she first heard about it. "I had to plan around it to participate because it's difficult with my civilian job." A 12-year veteran of the Rangers, she got involved when her own kids were part of the Junior Canadian Rangers.

The trip has been a lot easier since they left Parry Sound, she says. "Compared to the Albany River, we just sit. It's relaxing." Master Corporal Jason Hunter, from Peawanuck, says, "It's fantastic. People will come out on their decks and say, 'Hey what's going on.' We tell them and they say they've never heard of the Rangers. And we educate them about what we do."

Photos: 3 CRPG Public Affairs

For sure, anyone in the south seeing the Rangers for the first time might be confused about what, exactly, they do and are. Their dress – red sweatshirts with the ranger logo, CADPAT pants and a red ball cap, looks sort of military, especially if you, like many civilians, are not quite sure what soldiers wear. And, at least with 3 CRPG, it's easy to form the common misconception that everyone involved with the Rangers is Indigenous. All but one of the Rangers on this trek – although not their Army instructors – is either Cree or Ojibway. In the High Arctic there are many Inuit Rangers, as well. But that's not a rule. Anyone who lives in a community that is home to a Ranger Patrol can join.

As to whether they are soldiers, that's a little more complex. The various Ranger Patrols do follow a military set-up. Each of the five Patrol Groups is set up like an infantry battalion, broken down into companies, each company consisting of numerous platoon-sized patrols. Rangers take the same oath as other members of the Canadian Armed Forces. But there are big differences. There's no requirement about universality of service. Says Major Charlie Ohlke, the commander of the 3 CRPG's B Company, which covers the western half of Northern Ontario, "You serve your community in your community." There is no requirement of basic training. "We regard a Ranger as fully trained upon enrollment. We go to them for their experience." And while you need to be at least 18 to join, there is no retirement age.

They are armed – with the C-19, a custom bolt-action rifle that, says Ohlke, is intended for sustainment and protection – from polar bears as much as any imagined enemy. When the Army was developing .308 ammunition for the new rifle, says Ohlke, "We had two objectives. It had to pierce a polar bear skull through the polar bear's hide," but also bring down "a caribou without blowing the back out of it." The C-19 is, he says, "a beautiful rifle."

Back in the days of their founding in the late '40s, as the Cold War heated up, the Rangers' primary task was to keep an eye on the remote regions of the Arctic, and to serve as guides for any Regular military units that needed to operate there. Today they can also provide ground search and rescue teams when someone goes missing. For the past two years, many of these Rangers have been employed full time (they are paid the same as Class B reservists) helping communities across the north deal with Covid. "One of the big things the Rangers can do is support command and control and organization," he says.

The Rangers may not receive basic training, but that doesn't mean they aren't highly trained. They learn search and rescue techniques, night navigation, first aid and tracking. The training work falls largely on the group's cadre of Army NCOs. Master Warrant Officer Carl Wolfe is the company sergeant major for A Company. He began working with the Rangers in 2010, after a tour of Afghanistan, and for the ensuing 12 years his job was training the Rangers, a role that took him away from the group's headquarters at CFB Borden for an average, he says, of 150 days a year, much of

it travelling to fly-in communities that were home to Ranger Patrols. He became A Company's CSM quite recently. "They said I'd be put at a desk, but it doesn't seem to be working out that way." Covid has turned everything upside down.

Their current trip might look purely like an exercise in showing the flag, so to speak, but they are still treating it like an exercise. At night, they work on their first aid, and motoring along the Trent Severn and Rideau Canal systems has given them plenty of opportunities to hone their boat handling skills. "Yesterday was quite interesting," Wolfe says. Working on a body of water like this is very different from James Bay or the Albany River. "These guys have never had bumpers or lines or docks. They're really good with currents and coming alongside beaches and rocks." There are no buoys up there, no aid to navigation, and the river is constantly changing.

Ranger Wesley Redfern lifts an enormous black fiberglass box out of the bottom of his canoe. It's his boat's version of the safety kits that pleasure boats carry down south, but a considerably more serious version, as befits a craft that has to work on an enormous body of water like James Bay or up the sparsely populated Albany River. So, yes, there's a throwing line, but there's also a pair of binoculars, a battery charger, and more tools than a pleasure boater would ever consider necessary.

His is the oldest of the canoes here, and like the other Ranger craft, with the exception of the slightly fancier version with a central control console that is from headquarters at CFB Borden, is his personal property. They are all more or less identical – 24 feet long, with a 30 or 40 horsepower engine, wood framed and planked, then covered with canvas. They weigh about 600 pounds, which means that three or four people could push one over a sandbank in a river.

It's hard to emphasize just how important these boats are to people who live on the shores of James and Hudson Bay. As George Edward, another Ranger who made the trek south with his boat, says, "It's my life. In a world of no roads, we need them to travel, but more importantly, to fish and to hunt." (I was repeatedly told that it was possible to pack five moose carcasses into one – cut up moose carcasses, but still.) These boats, MWO Wolfe told me, cost about $20,000, and these Rangers are not rich. So, it's impressive that they are willing to put them at the service of the Rangers, their communities and really, all of us. Impressive – but for the Rangers not unexpected. ■

STALWART GUARDIAN:

AIR MOBILITY, URBAN ASSAULT, AND A BRIDGE THAT WENT BOOM

By Staff

When you're confronted by a determined foe, sometimes the only solution is to blow the bridge. After a hard-fought battle to seize the strategic crossing earlier in the day to prevent an enemy force from advancing to the main highway, the infantry company and combat engineers now faced reports of enemy reinforcements crossing the border to the south and moving toward the bridge. With few other options available, the engineers placed charges and, in a thundering explosion, destroyed the bridge.

The demolition was the culminating highlight of Exercise Stalwart Guardian, a 4th Canadian Division training event for Reservists from across Ontario in the Petawawa training area in late August. The final day of the two-week exercise included an early morning air assault by CH-147 Chinook to seize the bridge, followed by an urban assault on a nearby village suspected of being a staging area for the enemy. (In a scenario drawn from the Canadian Army Simulation Centre's Decisive Action Training Environment, the country of Atropia requested United Nations support after an incursion by its southern neighbour, Limaria. The UN responded with two battalions, a European mechanized battalion and a Canadian light infantry battalion that were tasked with securing key locations and then closing the border to deter a full-fledged invasion.)

After more than two years of mostly individual and unit training, the return of Stalwart Guardian was a welcome event for the more than 145 Reserve infanteers primarily from 32 Canadian Brigade Group (CBG) but also 31 and 33 CBG.

"The last time we had this many people out [for a proper] Stalwart Guardian was in 2019," observed Lieutenant-Colonel Jason Kearney, the commander of the Toronto Scottish Regiment, the lead unit for the exercise. "At a unit you can only train so high; … [here] our mandated training was to get up to Level 2 (section) live and Level 3 (platoon) dry."

The light infantry battalion – comprised mostly of Reserve members from the Queen's Own Rifles, the Royal Regiment, the Lorne Scots, the 48th Highlanders, the Toronto Scottish, and the Lincoln and Welland Regiment – was organized into two companies "so we can exercise platoons working within a company context, but still doing their own platoon level tasks," he explained.

The training followed a typical path from

Photo: DND

individual range work to pairs and then live section tasks, followed by dry platoon tasks – a raid, an ambush, and a search and destroy mission. On previous iterations of Stalwart Guardian, members of the 3rd Battalion, The Royal Canadian Regiment (3 RCR), would have been fully integrated, serving as Regular Force mentors and advisors to Reserve members throughout. This time, 3 RCR served as the range conducting staff and embedded with Reserve units where needed. Though a less direct instructing role, "they did a great job mentoring our young privates, corporals and even the section commanders," Kearney said.

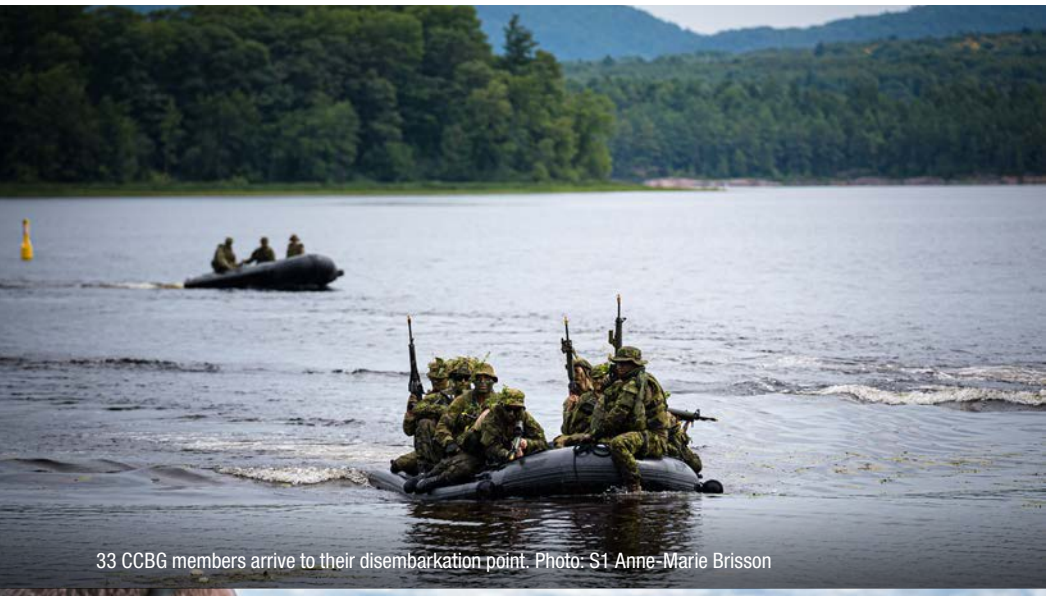
In years past, the exercise would also have included artillery and armour in the overall scenario, visible on the network even if the guns and heavy vehicles were located and training elsewhere. Instead, Reserve artillery units from across 4th Division gathered at the training centre in Meaford for Exercise Steel Rain while armour units conducted individual courses in Petawawa. "I think we were the only [training audience] not getting qualifications out of this," Kearney noted. "We were just training, getting the guys out and letting them live for a week in the field."

His primary objective was to see troops challenged and absorb "one or two things that stick with them that they can take back to the units." Early feedback from the range conducting staff suggested "they saw development from everybody, from when they first arrived to the last range they were able to conduct. That tells me everyone is engaged. The platoon tasks were challenging and … for the leadership, they had a problem they had to think through and crack and really exercise individual soldier skills."

"These guys have been training all year to prepare for a dynamic exercise like this," said Master Corporal Manreet Singh of 3 RCR, who was embedded with a rifle platoon assaulting the village. "This exercise is testing all the training activities that they have conducted over the year … [and] provided them a great opportunity to finally exercise all of that on a larger scale in a company context.

"They did fantastic," he added. "Some of these guys were working hard all summer and had some good experience coming into this. And others were able to soak it in like a sponge."

For the engineers, the most notable skill was blowing a bridge, a rarely exercised art, according



33 CCBG members arrive to their disembarkation point. Photo: S1 Anne-Marie Brisson

32 CER engineers prepare a bridge for demolition. Photo: Pte Dominic Sobotka

A TAPV gunner on the remote weapon station course. Photo: DND

to Chief Warrant Officer Sean Allen of 32 Combat Engineer Regiment (32 CER). "It is a unique skillset and something we have not done in a long time. The last time I remember physically touching something like this was in 1995/96." While the knowledge of where and how to place charges is still on the books, few Regular and Reserve Force members have experience "bringing down a bridge to achieve a gap or an obstruction inside the gap so nobody can over-bridge it," he noted.

In addition to working alongside the infantry, the 42 engineers from 32 CER, augmented by 31 and 33 CER, and supported by 10 Regular Force engineers from 2 CER, introduced a new assault boat – a variant of the Royal Canadian Navy's new Rigid Hull Inflatable Boat – and conducted other demolitions. "There are about 25 different battle task standards that we are covering off from section level to squadron level," said Allen, who began his career with 34 CER in Valcartier, Quebec, and served with 33 CER for 15 years.

Like other Reserve units, the engineers have had limited collective training for the past two years – many, in fact, were deployed into long-term care homes and on other domestic operations. "There were a lot of happy faces even though they were working all through the night," he said the morning after engineers had cleared an area in the range before then building the Acrow and Bailey bridges they would later demolish.

BUILDING ARMOUR CAPACITY

A few kilometres away, at what they were calling Camp Worthy, about 150 armoured personnel from the 1st Hussars, the Windsor Regiment, the Ontario Regiment, the Queen's York Rangers and the Governor General's Horse Guards worked with members of the Royal Canadian Dragoons (RCD) on individual training.

"This is not tactical," said Lieutenant-Colonel Bruce Clayton, commander of the Governor General's Horse Guards in Toronto, whose staff oversaw most of the planning for the exercise. The brigade's initial intent had been a collective training scenario in the field, but after two years of adapting to pandemic conditions, most of the armour commanding officers (CO) suggested formal individual training courses were needed.

"It is basically a mini armoured battle school," Clayton explained. Units were able to send candidates and a few instructors to "plug and play" and will get back qualified gunners and drivers for their squadrons. "We are building capacity for the other COs."

The courses included remote weapon system operation for 45 gunners on the Tactical Armoured Patrol Vehicle (TAPV), TAPV driving for 24 candidates, and Medium Support Vehicle System (MSVS) driving for 11 candidates on the Mack Defense logistical support vehicle. Four additional drivers did the course for air brake training and to accumulate kilometres behind the wheel for their qualification. "We'll be getting 15 new truck drivers," Clayton said.

Most soldiers on the three courses also fired the M72 LAW rocket-propelled grenade launcher to complete a missing component from an armoured crewman course held earlier in the year. The training event culminated on the final day with a live TAPV gunnery range.

"It has been a couple of years, even longer, since all of the units have gotten together to run this sort of training," said Chief Warrant Officer Jim Shouldice, the Regimental Sergeant Major. "It is giving everybody an opportunity to … remember how to live in a tent. And now we have all these people going back to their units with these qualifications that [otherwise] would have been harder to obtain."

"Morale is high," said Clayton. At the end of each day, candidates typically congregated to talk gunnery and driving. "For an old warhorse like me, listening to young troopers talking about [that] is great."

Though the integration of Regular and Reserve Force members was different than on past iterations of Stalwart Guardian, he credited the Dragoons for the care at the camp and the quality of the instruction. "We could not have done this without [their] instruction on the courses. They are passionate sergeants and master corporals."

One of those was Sergeant Jesse Marion, overseeing a team of RCD and Reserve instructors as they guided 45 gunners through every aspect of the Kongsberg Protector remote weapons station on the TAPV, from powering up the system to ammunition loading, stoppages, disassembly, fire orders, and eventually live fire.

An intense former U.S. Marine who joined the CAF in the mid-2000s and served in Afghanistan, he stressed the importance of being able to operate and service the RWS under all weather and battle conditions, no matter what, and the significance of firing the weapon. "Being a gunner carries a lot of responsibilities," he said. "But when you arm that weapon and pull that trigger, it will change your life." That message "hit hard for some," he added. ■

Members of 32 CBG take a village from insurgents. Photo: Chris Thatcher

Preparing to assault a bridge crossing. Photo: Chris Thatcher

Infantry Reserve soldiers load into a CH-147F Chinook for an air mobile assault. Photo: DND

ARCTIC SUMMER

By Lt(N) Andrew McLaughlin

An observation post in Nunavut. Photo: Cpl Parker Salustro

An ARCG member watching the sea.
Photo: Bdr Julia Currie

Medical evacuation training at the Canadian High Arctic Research Station.
Photo: Bdr Julia Currie

The Grey and Simcoe Foresters (G&SF), an Army Reserve unit headquartered in Barrie, Ontario, recently led a Joint Task Force (JTF) of over 150 Canadian Armed Forces (CAF) members made up of Army and Air Force assets and personnel.

Operation Nanook-Nunakput was conducted over the latter half of August in the Cambridge Bay, Nunavut area. The operation enabled CAF elements to conduct presence activities in the Arctic, as well as foster stronger interoperability with northern partners, all while keeping an eye on shipping in the strategic Northwest Passage.

"This was truly a unique mission for a Reserve regiment," said Lieutenant-Colonel David Meehan, JTF commander and commanding officer of the G&SF. "It really put our organization to the test, and our soldiers were up to the challenge."

The 4th Canadian Division Arctic Response Company Group (ARCG), led by the G&SF, deployed forward of the JTF as a Land Task Force and conducted patrols in multiple High Arctic locations.

The G&SF is no stranger to Arctic operations. As the unit with the Canadian Army Mission Task of maintaining and further developing the ARCG and associated capabilities, they have become experts in operating in harsh climates and conducting rapid response missions. During the pandemic of 2020, the unit stood up the ARCG in a matter of hours and deployed it forward to CFB Borden for an emergency deployment that, thankfully, wasn't required in the end.

"That's what the ARCG does," said Meehan. "We train year-round for various contingencies, which all have a common element: The ability to move, communicate and survive in the extreme environments found in the farthest northern areas of Canada, and do so safely and effectively."

Royal Canadian Air Force (RCAF) aircraft transported the ARCG across inhospitable terrain to distant observation posts, while Canadian Rangers, the specialized Canadian Army Reservists and cold weather operations experts, escorted and guided them on the ground. "This was a team effort. The operation wasn't possible without our partners from the RCAF, who deployed

Arctic Response Company Group members during a medical evacuation exercise in Cambridge Bay. Photo: Bdr Julia Currie

ARCG and 440 Squadron members load a CC-138 Twin Otter.
Photo: Bdr Julia Currie

Conducting a recce in a 408 Squadron CH-146 Griffon helicopter.
Photo: Bdr Julia Currie

several airframes and crews to the operation, and transported troops and materiel across vast distances in extremely challenging weather conditions."

The land component of the operation built on the Foresters' existing operational expertise, while working alongside the 1st Canadian Ranger Patrol Group, other government agencies, and local community partners. "The Rangers were especially critical to mission success," said Meehan. "They're the local experts on navigation and survival up there, and we work extremely closely with them. Their guidance and mentorship are vital."

The headquarters was also lucky to have welcoming hosts from the local community, and partners from other government organizations. "The Canadian High Arctic Research Station was imperative to our operation," he said. "They have local knowledge and resources we just couldn't have found elsewhere. They were also great hosts, opening their doors to well over a hundred CAF members conducting round the clock operations.

Over the course of several weeks, the Land Task Force set up observation posts along the Northwest Passage to conduct surveillance of shipping in the vital Canadian waterway and reinforced the CAF presence in the North.

This was something new to the troops of the ARCG. "They're used to operating in the Arctic during winter months, but the mission we were conducting was one that could only be achieved in the summer, when the sea lanes were opened by melting ice," explained Meehan. "We're usually up there in the winter, living and operating on the ice in extreme conditions, so it was a bit of a change utilizing ATVs instead of snowmobiles, and in a bit better weather."

The fact that the ARCG was able to adapt its force employment model to fit this new surveillance task – during the summer when most Reservists are off on training courses across Canada – and do so effectively, proves the concept behind the mission task, according to Meehan. "From the very beginning, we had dozens of our soldiers put their hands up volunteering for the operation. That really reflects on their dedication to this specialized role, and to their readiness to deploy anywhere, on short notice." ■

THE Right Stuff

Looking for a new challenge?
Here's some advice on how to survive selection for one Special Operations Forces unit.

By Chris Thatcher

If you've ever wondered what *S.W.A.T, CSI, NCIS*, and *Code Black* might look like all rolled into one, meet the Canadian Joint Incident Response Unit (CJIRU). Part special forces operators, part forensic scientists, part police detectives, and part medical response specialists, the unit provides an agile and rapid response for detecting, identifying, and mitigating chemical, biological, radiological, and nuclear (CBRN) risks in support of special operations missions.

"We ask a lot of our people," acknowledged commanding officer Lieutenant-Colonel Geoff Mundy. "We are very fortunate that we attract such high-quality candidates, and we are able to retain such highly motivated people."

At a time when the Canadian Armed Forces (CAF) is pulling out all the stops to retain talent, organizations like CJIRU offer those with the right stuff a unique unit in which to further their education while still serving as operators under demanding conditions.

"CJIRU is composed of tactical proficient technical experts who can address very complex threats presented by [CBRN] agents with the use of leading-edge technology and deep academic knowledge," said Mundy, a former infantry officer who has served with Canadian Special Operations Forces Command (CANSOFCOM) for much of the past 15 years.

The unit has its roots in the Royal Canadian Mounted Police (RCMP) Nuclear, Biological Chemical Defence Response Team, formed with the assistance of a CAF cadre at CFB Borden in the 1970s. After September 11, 2001, the CAF created its own Joint Nuclear Biological Chemical Defence company in 2002. Four years later, in 2006, the company became a part of the nascent CANSOFCOM and was renamed CJIRU.

Its primary mandate is to detect, identify, characterize, and mitigate CBRN hazards through sampling and identification, decontamination of people or equipment, and surveillance to determine where the hazardous agent is in a contaminated environment. Or, in layman's terms, figuring out what the hazard is "because the insidious thing about CBRN is that you can't smell, see, hear or feel what it is," Mundy explained.

CJIRU has also developed the ability to conduct sample analysis to "an evidentiary standard" to help attribute the sponsor of an attack in support of its continued role with the RCMP and other government agencies like the Public Health Agency of Canada (PHAC). It can provide advanced laboratory techniques for processing and analyzing collected materials for intelligence assessments, and hazard modelling using specialized software. Finally, members are trained to deliver battlefield casualty extraction and CBRN medical treatment in and from contaminated environments.

Not surprisingly, CJIRU is selective about who gets in. Many apply for its assessment phase, known as selection, but only some survive the gruelling one-week test each spring.

"A lot of our tasks and missions are done in small teams, where low ranks – corporals and master corporals – are leading teams out the door, and we need to have trust in individuals," said Derek, a warrant officer who leads the unit's recruitment. (operator last names are being omitted for operational security reasons.) "We're very particular on their maturity and how they work in a team before we train them on all the other things they need to know."

Applicants to CJIRU are screened, primarily for medical reasons, before the selection assessment, but most are invited to attend a trial that demands everything of candidates, physically and mentally. Only the resilient advance.

"You will not know what's coming," Derek emphasized. "Your days will be full of tasks, and you'll be evaluated at all times, but you will not know what you're evaluated for. The purpose of the assessment phase is to determine your probability of success on the course that follows. "

His advice? Trust the process. "Because you don't know what's coming, you are in the dark the entire time you're being evaluated, with zero feedback. You may think you're doing poorly, but you don't know on what, and some will voluntarily release from the selection. My advice to anyone: Finish the selection no matter how you feel about your own performance. Let the assessors do their job and let the process decide if you're a fit for the unit or not. If you're putting in the work to get yourself on a selection, finish it."

Josh, a corporal and relatively recent candidate for CJIRU, agreed. "If you are thinking of trying out, go for it," he said. Even failure can have its reward and perhaps a second chance. Though he was aware of how little he understood about what evaluators were expecting of him, "I think my head was so focused on my goal of finishing that to me the option to quit wasn't there."

For those candidates who measure up, the next phase is an approximately 10-month course that includes a tactical component covering skillsets

Opposite and next page, members of CJIRU on Ex Caustic Reckoning in June. Photos: CANSOFCOM Imagery Section

like shooting, tactical driving, close quarter battle, and moving in an urban environment; a technical component on decontamination and how to scale it to various scenarios; and formal university-level education in chemistry, biology and nuclear physics at the Royal Military College (RMC) in Kingston. Those three tactical, technical and knowledge components are then brought together in a series of exercises known as the "green" phase.

"It was definitely long at times and fairly fast paced," said Josh, who was attracted to CJIRU by the higher educational opportunities while maintaining soldier skills. "There is not a lot of down time in those 10 months. It all culminates on a final exercise, which is a test of all the skills you have learned."

While his infantry background helped with certain aspects of the course, all trades can succeed, he said. "Regardless of what you have learned in your previous trade, you are going to find a niche somewhere in those 10 months where you can be a benefit to your course mates or have expertise where others don't."

One reason for the demanding selection? "There isn't a lot of failures on the operator course," Derek observed. "The selection process is rigorous. No one's going to want to do that twice. So, if you're successful, you're going to want to be successful on the course."

One of the core strengths of SOF units is the empowerment of being surrounded by likeminded, highly motivated operators, he added. "Everybody went through what you went through to be here, and everyone will then help each other to get through the course."

The introductory course is only the first major step in a career of continuous learning. "Our high readiness responsibility means that our people can't afford to let their skills fade, they need to keep them up to date," said Mundy.

That means a constant repetition of tactical, technical, and academic training, testing the ability of operators "to problem-solve in a scientific setting," he said. CJIRU maintains a close working relationship with Defence R&D Canada research centres in Suffield and Valcartier, with the PHAC national microbial lab in Winnipeg, and with other academic institutions. "Corporals and master corporals have professional linkages and relationships with scientists at those organizations that develop over time. If they are presented with a problem they can't solve, they can reach back to those scientists to provide specialist support."

And because operators are frequently deployed as part of CANSOFCOM overseas missions, the feedback loop from operations to training is fast, noted Derek. "It's all operators training operators."

If the nature of the work suggests the need for a background in science, technology, engineering and math, Mundy is quick to counter that notion. "A STEM background may give you benefits, but it's not necessary. We will give any applicant the education and training they need to operate at an extremely high level."

CJIRU casts the recruiting net as wide as possible, he noted. While a majority of candidates come from combat arms trades, there is no particular branch or cap badge preference. "Everything you need to know will be taught on the CBRN operator course. It all comes down to your ability and willingness to learn," said Derek.

"We look for people who are open to new experiences, who aren't constrained in their thinking, who are humble, and who are committed to professional growth," Mundy emphasized. "And people who are physically fit. The job is incredibly physically demanding if you think of trying to work in protective equipment while still maintaining a high level of situational awareness."

Mundy, Derek and Josh all stressed attributes such as determination, emotional stability, conscientiousness, humility, and being intrinsically motivated. "We want self-starters and people who are interested in how things work and how to solve difficult problems under the most demanding circumstances," said Mundy.

Like all SOF organizations, "we believe that operational effectiveness is derived from the personality traits and attributes of our membership. It is the people who matter the most."

For operational security reasons, there are limits to what can be shared about the job with family. CJIRU has family support programs and Mundy recognized how much is asked of family members. Derek urged any applicant considering CJIRU "to make sure you're very open about what the job requirements are going to be. Due to being a high readiness unit that can be out the door on short notice, it's not just you that has to be ready; the home front needs to be ready." ■

Information about CJIRU job opportunities is available on CANSOFCOM's Instagram and LinkedIn pages.

Wargaming the Information Environment

As the Russo-Ukraine War exemplifies, the relationship between information influence and conditions of the battlefield are a key dimension of warfare. How do we prepare to operate in this domain?

By Sean W. Havel

In July of 1870, in the spa town of Bad Ems, a polite conversation between a Prussian King and a French diplomat took place over the candidacy of a Hohenzollern prince to the Spanish throne. The two departed on good terms, despite the King's refusal of the diplomat's demands to withdraw the candidacy of the Prince. The King then asked his Chancellor, Otto von Bismarck, to release an account of the events. Bismarck's press release – which should have created little fanfare on the European stage – became the catalyst for the rise of the German Empire.

> "We war-game because we must. There are certain warfare problems that only gaming will illuminate."
>
> **Robert Rubel,** The Epistemology of Wargaming.

At full liberty to interpret events as he wished, Bismarck removed the King's conciliatory language and reframed a cool-headed conversation as one of mutual insult. He sharpened the narrative to suggest the French diplomat had made his demands under the threat of war and then characterized the conversation as mutually disrespectful. On July 13, the released communique sparked stark reactions from the already inflamed French people, confirming to them German disrespect of France's leadership and position in Europe. France's leaders shortly after succumbed to public opinion, mobilized their armed forces, and declared war – a war that would end disastrously for France, ending her empire and forging a new German one.

This brief example demonstrates how war and politics are one in the same. To advance his own interests and those of his state, Bismarck used an opportunity to reflexively control French foreign policy through its civilian population, setting in motion conditions where military victory could be secured through a defensive war. Just as Bismarck mobilized a narrative to achieve his political objectives, modern states now pursue political as well as military objectives in the now far more ubiquitous information environment (IE).

The modern IE is interconnected via physical networks, computer logic, and virtual platforms that enable not only the dissemination of information, but also amplification of information through mass participation and social media algorithms. Unlike in the 19th and 20th century, there is no escape from being part of the digital IE. Anyone with a phone can amplify what is being injected into that system to you, and thereby influence you. Thus, every time you observe, orient, decide, and act with information, you may well be playing a role in international conflict.

For these reasons, the relationship between influence in the IE and the conditions of the battlefield represent a key dimension of warfare. The ongoing Russo-Ukraine War exemplifies this reality, being a war for territory and a

struggle for the hearts and minds of the online world. How actors frame reality holds serious military implications, potentially justifying aggression, disrupting political processes, degrading a nation's will to fight, and potentially even exerting reflexive control on that nation on behalf of an adversary.

So how can defence circles conduct research of this relationship in a controlled environment? By what means can we prepare as an institution to operate in this domain? These are questions I was asked to help answer through the NATO System Analysis Studies-151 (SAS-151) working group between July and October 2021. Our team's objective was to tackle this domain by executing a series of wargames to derive insights into how actors conduct activities in the IE, and how effective their methods are. What is described in this article is our methodology and findings, which have important implications for Canada, specifically, and democracies, globally.

AUDIENCE-BASED APPROACH TO WARGAMING

Initial attempts of the working group to wargame operations in the IE used Matrix Games, which are games with freely described actions whose success is determined based on structured argument and discussion. Matrix games proved, however, to be insufficient for capturing impacts in the IE, primarily due to the subjectivity of the arguments used to anticipate those impacts. If anyone could predict the success of a social media campaign, that would answer a century's worth of questions about how humans respond to communications – an unlikely prospect.

In truth, the IE represents a domain that is too complex, obscured, and volatile to be successfully rationalized in a single discussion. We therefore required a way to conduct wargames in the IE that could capture its chaotic nature in a controlled setting and reveal what would happen rather than what should happen. To do so we relied on two key academic underpinnings that matrix games rely on: Crowdsourcing, or the theory that crowds cognitively outperform individuals; and the predictive power of role-play, focusing on what will happen rather than what should happen, offering a better basis for the prediction of outcomes than expert opinions or game theory. Then these concepts were scaled.

The solution was to introduce an audience of real people who could react to a developing situation, respond to messages created by teams, be misled, create their own stories, and propagate their own narratives. The virtual audience thereby acted as an 'engine', providing automatic adjudication of the wargame based upon their interactions to content supplied by players as well as their responses to surveys of their attitudes to key topics in the scenario.

Yet the audience alone was not enough, and creating an authentic IE also required two additional items. The first was a simulated social media platform, which we achieved through the popular online chat service Discord. Discord is a platform developed for gaming communities, where individuals can create servers featuring various text and voice 'channels' to feature content on. Those channels can be quartered off by specific permissions, meaning individuals only see what the designers of the server intended. This is in addition to advanced features, particularly the ability to program bots to automate specific processes on the server. Bots allowed much of the exercise to be fully automated, including simulating trending topics based on audience interaction and allowing audience members to have their own 'feeds' with targeted social media content. In a short amount of time, a Discord server was created for the exercise, given the structure of a social media platform, and provided rooms for teams and facilitators to meet, plan, and manage the wargame. Discord also had a robust mobile app, which allowed all participants, especially audience members, easy access through their mobile device at all times. This further meant that the exercise could be conducted in a purely distributed fashion, opening it to participants from across the Atlantic.

The second piece was the development of a comprehensive wargaming scenario/narrative for the audience to form their reality around. Instead of the traditional Blue-Red, we created names and backstories for our geopolitical actors. These were the Organization for Collective Security (OCS), a collective security alliance made of liberal-democratic countries, and the Illyrian Federal Republic (IFR), a presidential republic with aspirations to challenge the local security order. Respectively, teams were given detailed breakdowns of their own geopolitical actors, their capabilities, and their relationship to bordering states.

The nation audience members were from, and where the game took place, was called the Hypatian Commonwealth (Hypatia). It is a newly independent state from the IFR, hosting a large Illyrian minority, which politically seeks greater integration with the OCS. Hypatia was heavily detailed, including interest groups who carried specific loyalties and personalities, detailed descriptions of political parties and their respective positions on key issues, and demographics mapped from region to region that described their economic, ethnic, and political makeup. Audience members were then given 'personas' based upon these demographics, including where they lived, their occupation, their ethnic affiliation, and various other factors which allowed audience members to 'build' their own character and own it, but without a pre-written script to follow.

LESSONS FROM AN INFORMATION WARGAME

Overall, the system described above ran for three games in a series, with the events of one game building the starting scenario for the next. Teams represented the OCS and IFR in each scenario, with the goal of the former to assist defending up to 50 live audience members against IFR disinformation and influence. The results our team produced demonstrated the added value of an audience in wargaming operations in the IE as an innovation while also providing interesting insights into the following topics:

- **Realistic Social Phenomena and Emergent Behaviour:** It was observed that despite the scenario and exercise not being in the 'real world', polarization on political topics, marginalization of moderate voices, political fatigue, radicalization, and other phenomena were observed. Audience members also responded to team actions by creating their own original content, becoming in some cases influencers of their own. They also were seen supporting narratives and accidentally distributing disinformation to sway others on Discord. Furthermore, they formed interest groups based upon given personas, which in some cases enabled injects into game state made from audience behavior, such as a referendum in one case. Importantly, team influence only had marginal effects on audience behavior, just as in the real world, with only slight nudges in attitudes.
- **Treading the 'Human Terrain':** Players had to understand, consider, and predict audience behavior, often having to deal with unexpected results. Real audience-centric decision making drove the wargame, with teams constantly having to figure out what audience members were responsive to, what issues they cared about, and how they might react to larger political decisions.
- **Powerful Capabilities Require Restraint:** The use of large-scale cyber capabilities, proxy groups, and overt force in some instances led to heavy audience reaction that was impossible to control. While removing the

Sydney the non-gender-specific OCS cyber-security koala says:

Illyrian Federal Republic TROLL FACTORIES use fake social media accounts to insert influences message into social media. BOTNETS then amplify these.

Always take a critical approach to everything you read!

ability of an influencer to post online can be effective, the news of such an event creates discussion and distrust to the conducting actor. Capabilities used in the presence of an information domain need to be contextualized with how they will be perceived and in what narratives the action plays into.

- **Unsophisticated Tactics are Powerful:** What proved the most effective in all info games was not the use of sophisticated capabilities, but low effort and simple techniques. Hyperbole, misattribution, simple bot-nets, and spreading disinformation were far more effective than the deployment of any info related capability. Deployed through the medium of memes and narrative-led techniques, they were powerful in their simplicity and popular with crowds.
- **Key Audiences Win Info Wars:** The first team able to identify the key audiences won the game. Some audiences, based on their personas, were either set in their stances or too removed from contentious issues to be influenced by adversarial actors. In one example, the IFR team focused on specific persona types and slowly introduced their narrative to them. The defending OCS team was broader in their approach, messaging to everyone and not getting the message out to IFR targets. This resulted in IFR targeted personas becoming empowered on the social platform, working as a jumping off point for further IFR spread of their narrative.
- **Influencers Win/Lose Audiences:** Building relationships with influencers was highly important to amplify messaging but equally vulnerable to becoming pariahs used to prove a specific narrative. In one exercise, the Hypatian Defence Minister was systematically made the symbol of corruption and ethnic oppression in the country, meaning when military action was needed, audience members interpreted the move as self-interested and hostile towards those personas being ethnic Illyrians. In another exercise, the OCS team was able to know an influencer was being targeted, allowing them to defend the individual and even find insights into the IFRs plan based on that target.
- **Preoccupation with Adversaries is Dangerous:** The OCS team lost wargames when they focused too much on countering their adversary instead of focusing on their own plan. By the end of some games, the OCS narrative was diluted because the game became about those IFR posts. When countering disinformation, it is important to also 'play your own game' and tell your own story to offer an alternative.
- **Cognitive Diversity and Out-of-the-Box Thinking:** The teams with the most cognitive diversity and that thought out of the box were the most successful. Clever use of hashtags, entertaining multimedia content, and selective engagement with audiences resulted in success.

The IE is a crucial domain for Canadian defence and will only increase in relevance as future conflict arises. While in other domains, Canada can benefit from its geographic position for defence, it will remain vulnerable in the information domain without concerted effort to address adversarial campaigns. Deployed abroad, Canadian Army operations are further at the mercy of losing the information advantage, with loss of local trust and unit disorientation potential results of adversarial information operations. Wargaming is one tool to assist the orientation of the force in this domain, allowing for new techniques and capabilities to be explored before they are tried in the information battlefield. ■

`Sean Havel is a strategic analyst with Defence Research and Development Canada's Centre for Operational Research and Analysis (DRDC CORA) and a member of the Joint Targeting Section (JTS).

Photo: S1 Zach Barr

WHERE'S THE GAP?

What capability gaps are most likely to confront the Canadian Army in the next decade? Members of the Directorate of Land Requirements (DLR), the training schools at the Combat Training Centre in Gagetown, and other subject matter experts across the Land Force will be asked to weigh in this fall.

In the coming weeks, select participants will receive a form from a team at Defence R&D Canada (DRDC), supported by the Canadian Army Land Warfare Centre (CALWC) in Kingston, asking for input into the future capability needs of the Army. What, exactly, they hear back is an open question.

"It is the first time we have done this, so it is a proof of concept," said Lieutenant-Colonel Patrick Newman, the Concepts Team Leader at CALWC. "It's a bit of a voyage of discovery. We are still not quite sure [what to expect]."

The Army's current digital divide and need to network the tactical edge are well known, as are more specific equipment gaps such as Ground-Based Air Defence (GBAD). The extent or nature of anticipated future gaps are perhaps less understood.

"We have a generally good idea of where the gaps are right now. It is a case of, in their opinion, how broad is the gap in terms of capability and how deep is it," said Dr. Nancy Teeple, a defence scientist and strategic analyst with DRDC's Centre of Operational Research.

Though CALWC often explores Army challenges through a long lens, looking 10 to 20 years ahead, DLR project directors typically have a much shorter and narrower view of specific equipment. Asking those subject experts to "crystal ball" the future is a big ask, Newman acknowledged.

"I'll be blunt. People are not comfortable doing that," he said. "It requires a fair amount of self-confidence and an acceptance that you might be wrong, no matter what."

Still, DLR is the right place to start, Teeple asserted, because "they will be very good on the equipment side in terms of how big a capability gap we have and how long it might take to procure. They understand that better than anybody else."

To help guide the process, the team has developed a table showing the possible threat change between 2025 and 2035 and how that could affect Army capability requirements. "It gives them something to work with to visualize. Obviously, it is a forecast; you never know about black swans and other types of events," she explained. "It provides a reference point to envisage what the future will look like and a survey tool where they can select based on measurement indices the type of gap they are looking at under the operational function of a specific capability to their area of specialization. You have the extent of risk, scope of capability in terms of niche or general capability, size of gap, type of gap, and any additional comments on what the gap might mean into the future."

Capabilities like GBAD or the need for new anti-tank guided munitions are straightforward gaps to confront. Newman hopes SMEs can pose questions CALWC and DRDC might not have considered, or approach problems more holistically because of their knowledge of multiple ongoing projects.

"We may get some nuggets that come out of it that we just don't know," he said. "GBAD, yes, but what about GBAD versus space or GBAD with high energy lasers? The nuggets might be on the peripheries. I think that may be the sweet spot, too."

He's also keen to hear what subject experts across the Army have to say about the structure needed to address capability gaps. "Capability is one thing, but the structure that goes with it could be interesting. When we talk about capability we tend to think of equipment, personnel and training. Anything on structure recommendations could be interesting because then you are looking at widespread change."

While SMEs are not expected to take long responding to the survey, it will take the small DRDC/CALWC team some time to complete the analysis and produce a report. Consequently, input on structure is unlikely to impact the Army's current work on Force 2025, a structure assessment that is part of its modernization strategy. But the feedback could influence subsequent force development efforts.

This first iteration of the gap analysis is intended to develop a template the Army can build on, Newman and Teeple explained. They have "compared notes" with the ABCANZ Armies (the United States, Britain, Canada, Australia and New Zealand) and some NATO partners to develop the survey and analysis tools, but "everybody does it a little bit differently," Newman noted. "The academic literature on this is also fairly sparse. … [This will be] a bit more of an organized, analytical, scientific method to, frankly, challenge some opinions on where the Army should go. We'll see how this works out." ■

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