

# The Success of the Light Armoured Vehicle

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As a military vehicle enthusiast I was quite excited to see the article by Frank Maas in *Canadian Military History* dealing with the Canadian Light Armoured Vehicle (LAV) series of vehicles (vol.20, no.2 Spring 2011). I was also keenly interested in the article as my Father was stationed at CFB Petawawa in the mid-1970s and at the time our neighbour was one of the people involved in the program to evaluate and purchase the LAV or in this case the Armoured Vehicle General Purpose (AVGP). The AVGP series of vehicles had just been introduced when I started my career in the Canadian Forces (CF) and over the past 33 years I have seen successive generations of LAV vehicles brought into service with the CF.

What I did notice while reading the article was that the evolution of the various LAV purchases and the vehicles associated with each purchase was not very well defined. As well, there was really no description of each vehicle and its capabilities. In order to understand the purchase of military vehicles, one must understand the vehicle and where it falls in the evolution of vehicle procurement.

As was stated in the article, the Canadian Government purchased German Leopard C1 tanks in 1978 to replace the aging fleet of British FV 4000 series Centurions which dated from 1952. Both of these vehicle types were fully tracked main battle tanks

**Abstract: In order to understand the purchase of military vehicles, one must understand the vehicle and where it falls in the evolution of vehicle procurement. This article, written in response to an earlier article in *Canadian Military History* by Frank Maas, examines the chronology and motivations behind the Canadian acquisition of wheeled armoured fighting vehicles.**

(MBTs) armed with 105 mm guns. As well, both MBTs were supported by recovery vehicles and bridge layers that used the same engine and chassis and these were also replaced at the same time as the MBT. Like any armoured fighting vehicle (AFV), the Canadian Leopard series has seen armour and armament upgrades but it was only a few years ago that all of the Leopard MBTs were destined for disposal. Combat experience gained in Afghanistan, however, saved this MBT and has resulted in the 120 mm armed Leopard 2 A6M being the latest Canadian version to serve in Southwest Asia.

The LAV vehicles in Canadian service are wheeled AFVs similar in many respects to the large Sd Kfz 234 wheeled armoured reconnaissance and anti-tank vehicles used by the Germans during the Second World War. Wheeled AFVs do not have the same cross-country performance as tracked vehicles, but as a bonus they can carry the equivalent in armament without all of the necessary maintenance requirements which can

make them cost effective and easier to deploy.

The AVGP series of vehicles purchased by Canada in 1976 was a 10.7 ton, 6 wheeled amphibious vehicle based on the Swiss Mowag Piranha I. Canada bought three versions: the Cougar 76 mm Fire Support Vehicle, the Grizzly armoured personnel carrier (APC) (5 or 6 passengers) and the Husky armoured maintenance vehicle. The Cougar used the same British designed two-man turret as the FV 101 Scorpion tracked reconnaissance vehicle and the Grizzly a Cadillac-Gage 1 metre turret (1 metre is the size of the turret ring) which mounted a M2 .50 cal heavy machine gun (HMG) and a M1919A6 C6 7.62 mm medium machine gun (MMG). This small turret had originally been designed for the Cadillac-Gage V-150 Armoured Car. For local defence, the Husky had a pintal mounted M1919A6 MG.

As Mr. Maas' article mentioned, these vehicles were welcome additions to the stable of Canadian vehicles although it was recognized that they did have limitations. Both the Cougar and the Grizzly had cramped turrets and the one-man turret on the Grizzly was especially challenging when it came to servicing the two machine guns.

The AVGPs went through several upgrades and their marine propulsion system was removed in the 1990s. Their service life came



to an end in 2009 with some being loaned or sold to foreign countries while others became gate guardians and museum pieces.

As the article states, the original AVGP series was very successful and prompted international sales to the United States Marine Corps, Saudi Arabia, Australia and New Zealand. These sales though were for the Swiss Mowag Piranha I 8-wheeled series of vehicles, notably the LAV 25 which uses a turret mounted M242 Bushmaster 25 mm Gun. The CF placed an order for over 200 of these 12.8 ton vehicles, called the Coyote, in 1993. The Coyote is a reconnaissance vehicle and was ordered as a replacement for the fully tracked 8.7 ton Lynx which had served as a reconnaissance vehicle since its purchase from Food Machinery and Chemical Corporation (FMC) in 1968. The Lynx had a crew of three and was armed with a remotely fired M2 .50 cal HMG and had a M1919A6 C6 (MMG) as a rear-mounted secondary armament.

The Lynx had augmented the four-wheeled British manufactured two-man FV 701 Ferret Mk 1 of which 124 had been purchased in 1954 and had initially been armed with a .303 Bren Gun and later a M1919A6 C6 7.62mm MMG. The Ferret was retired from CF service in 1981.

The Coyote is not amphibious and the CF ordered three versions, two with different types of sensor

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**Top: This is an image of a pristine Cougar AVGP from the late 1970s as was presented in the Mowag sales literature.**

**Middle: Cougar AVGP from the UNPROFOR Canadian Battalion 2 (CANBAT 2 - Bosnia) at Sarajevo Airport, January 1994.**

**Bottom: Grizzly AVGP with NATO Stabilization Force in Bosnia prepares to leave to go on patrol from the Canadian base at Tomaslavgrad (TSG), December, 2000. This vehicle is armed with a M2 .50 cal Heavy Machine Gun and a C6 7.62mm General Purpose Machine Gun in the Cadillac-Gage turret.**

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**Top: Lynx armoured reconnaissance vehicle photographed in CFB Gagetown, New Brunswick during the division sized Exercise Rendezvous 81 (RV 81). The weapons, a M2 .50 cal Heavy Machine Gun and the C5 M1919A4 7.62mm General Purpose Machine Gun, have been removed from the vehicle and secured in a weapons lock-up.**



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**Middle: Canadian FV 701 Mk I Ferret on patrol with the United Nations Forces in Cyprus (UNFICYP) in the mid-1960s. The M1919A4 .30 cal Medium Machine Gun which replaced the .303 Bren Gun is clearly mounted on this vehicle.**



C413-5 Canadian Forces Photo

**Bottom: Soldiers of The Royal Canadian Dragoons use the surveillance equipment in their Coyote reconnaissance vehicles to overlook the Serbian border town of Prešovo from high ground in the American sector of Kosovo, May 2000.**

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suites and the third which was just the basic reconnaissance vehicle. This vehicle type is still in service.

Prior to the purchase of the Coyote, there was the Bison series of 8-wheeled LAVs based on the Mowag Piranha II. The CF purchased 200 of these 13-ton amphibious vehicles in 1990. Employed as APCs (8 passengers), armoured ambulances, mortar carriers, maintenance vehicles, command posts, electronic warfare vehicles and, nuclear biological and chemical reconnaissance vehicles, some variants like the mortar carrier saw a short service life and were converted to other versions while many of the vehicles have gone through upgrades and the removal of the marine propulsion system. The Bison series of vehicles are still in service.

The Canadian LAV III entered service in 1998. This 17-ton vehicle is based on the 8-wheeled Mowag Piranha III and is armed with the same turret mounted M242 Bushmaster 25 mm Gun found on the Coyote. It is not amphibious and there are four Canadian versions of the LAV III – APC (6 or 7 passengers), command post, forward observation officer and engineer LAV. New Zealand bought a similar vehicle and the United



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States Army uses a more lightly armed LAV III derivative named Stryker. For US service Stryker has been produced in at least 10 different versions with others in the planning stage. As mentioned in the

article, the Canadian LAV IIIs have seen extensive combat service in Afghanistan.

As a point of interest, Canada originally purchased 66 of the M1128 Stryker Mobile Gun System (MGS)

(M68A2 105 mm Gun) vehicles in 2003, which were expected to arrive in 2010. However, in 2006 the Canadian Forces asked its government to cancel the Mobile Gun System acquisition. The MGS was originally intended to be used in the "Direct Fire Unit" which would include a TOW Under Armour (TUA), the anti-tank version of the LAV III, and a Multi-Mission Effects Vehicle (MMEV) with an Air Defence Anti- Tank System (ADATS) on a LAV III. The MGS was ordered to provide the direct gun fire capabilities of the retiring Leopard C2 tanks. However, with the usefulness of tanks being demonstrated in Iraq and the hurried deployment of Canadian Leopard C2 tanks to Afghanistan, the purchase of more modern tanks occurred with the announcement of the procurement of surplus Leopard 2 MBTs from the Netherlands. This resulted in the Canadian M1128 program being cancelled.

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**Top: LAV Bison Armoured Ambulance on public display in Ottawa.**

**Middle: M113A1CDN APC 36000 was reported by *Sentinel* as the first M113 delivered to Canada in 1965. Devoid of weapons and still in its original olive drab paint scheme with white markings, the introduction of this tracked APC added a new, modern combat capability to the Canadian Army during the mid-1960s. This vehicle was modified to the A2 configuration by the addition of external rear fuel tanks in 1992 and at the time of writing M113A2CDN 36000 is still in CF use.**

**Bottom: Canadian M113A2 with Armoured Cavalry (ACAV) shields fitted, Bosnia 1993. These shields, which were first used by the US military during the war in Vietnam, were designed to give limited frontal protection when firing the crew commander's forward mounted M2 .50 cal Heavy Machine Gun and the two side pintal mounted Light Machine Guns. Many of the Canadian UNPROFOR M113s in The Former Yugoslavia had these shields installed while in theatre in order to provide added crew protection when patrolling the volatile front lines between the warring factions.**

The article mentioned that in 1998 the wargame “Iron Reconnaissance” compared the LAV III against the M113, although which version of M113, the A1 or the A2, was not specified. The M113 was manufactured by FMC and was first fielded by the US military in Vietnam in 1962. Essentially a 12.3-ton fully-tracked “battlefield taxi” (11 passengers) that was air transportable, armed with either a M2 HMG or a M1919A6 MG, it took its lineage from the earlier M59 and M75 tracked APCs which were much heavier and expensive to manufacture. Several hundred of the diesel engine M113A1 vehicles were purchased by Canada in 1965 as a result of the cancellation of the Canadian Bobcat APC project. The M113A2, a mid-1980s upgrade, is easily distinguishable by the rear external fuel tanks. As stated in “CAMT 21-40 Characteristics of New Equipments with Notes on Their Tactical Handling and Employment (Provisional) – 1962” as amended in 1964:

The role of the M113A1 APC is simply to carry personnel, weapons and supplies. This will give the infantry mobility equivalent to armour. The M113A1 APCs are not fighting vehicles and the infantry have limited fighting capability when mounted in them.

Somehow comparing a modern turret mounted 25 mm armed wheeled LAV, which was designed as an Infantry Fighting Vehicle (IFV), with what was then a nearly 40-year-old tracked vehicle armed with an HMG and designed as a “battlefield taxi” appears to this reader as a bit lopsided.

To put the vehicle into context, the M113 series has been one of the most successful tracked vehicles in history with over 80,000 being produced since its introduction in the early 1960s. This vehicle series has been



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**Canadian LAV Coyote Reconnaissance Vehicles with NATO SFOR (Stabilization Force) at Velika Kladusa, Bosnia, March 2001. All of the equipment that is issued with the vehicle has been laid out for inspection.**

used by numerous countries and in several wars. Canada has employed the vehicle with both NATO and the United Nations and has used several versions including the standard APC, armoured ambulance, anti-tank versions mounting missiles, recoilless rifles, TOW weapons and ADATS, supply vehicles, armoured recovery and maintenance vehicles, command vehicles and bulldozer equipped vehicles. The M113A1 and A2 have even served as test-bed vehicles for such modifications as stretched versions, versions mounting counter mortar locating radar and, in an attempt to turn the M113 into an IFV there were even versions mounting the same General Motors turret with M242 25mm Gun as used on the LAV 25 and the Cadillac-Gage 1 meter turret from the Grizzly.

After 45 years of service, many of the Canadian M113s have been declared surplus although several hundred received life extension packages that have either had them modified to M113A3 standard, or lengthened by 1 metre, with an extra roadwheel inserted, and converted into Tracked Light Armoured Vehicles (TLAV). The M113 is an “old

warhorse” and in Canadian service has outlived the newer AVGP series of vehicles and is destined to serve on with the LAV III until 2020.

There is no disputing that Canada was a leader in the employment and manufacture of LAVs, but to fully understand the story of these interesting vehicles, it is necessary to understand their manufacturing lineage.

Ed Storey is the Expeditionary Force Command (CEFCOM) Headquarters war diarist. He joined CEFCOM in 2008 as a reserve engineer warrant officer following a 26-year career in the regular force. Following a trip into Afghanistan in July 2009, Ed initiated a plan called Operation Keepsake. October 2010 saw Ed as part of the Camp Mirage close-out team where he was tasked to collect the camp mementos and recover the memorial for repatriation back to Canada, and his work was highlighted in the Canadian Forces *Maple Leaf* Newspaper and *Frontline* Magazine. Ed was back in Afghanistan in 2011 continuing his work with Op Keepsake, at which time he worked on collecting mementos from that theatre of operations and also worked on the repatriation of the Kandahar memorial. Ed is also on the DND-sponsored Afghan Legacy Project committee and is actively involved in the work of preserving the legacy of the Canada’s involvement in Southwest Asia for future generations. Ed lives in Ottawa with his wife and two teenage children.