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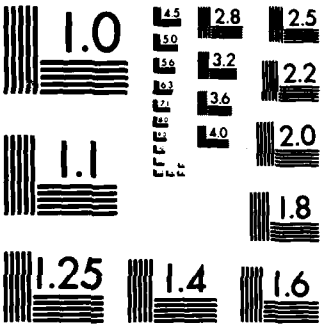

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STUDY PROJECT

YOU CAN GET THERE FROM HERE: THE LIGHT ARMORED VEHICLE

BY

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15 APRIL 1985

US ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013

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This summary outlines the need of Light Infantry to have additional combat power to be able to sustain itself in Combat where enemy armor is prevalent. The essay neither proves nor disproves the theory or TO&E of a Light Infantry Division but recommends a battalion-type unit of light armored vehicles which could be op-con or attached for missions based on the factors of METT's. These units have additional value in corps rear areas as RAP units and as needed can plug holes for the

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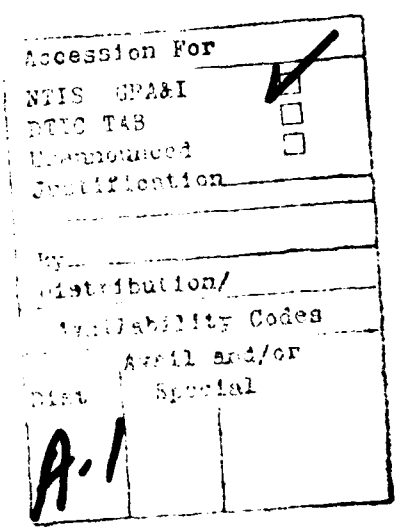

Name: COL Peter E. Genovese, Jr. NJARNG

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Executive Summary.

This summary outlines the need of Light Infantry to have additional combat power to be able to sustain itself in Combat where enemy armor is prevalent. The essay neither proves nor disproves the theory or TO&E of a Light Infantry Division but recommends a battalion-type unit of light armored vehicles which could be op-con or attached for missions based on the factors of METT's. These units have additional value in corps rear areas as RAP units and as needed can plug holes for the Corps Commander. A recommended TO&E is also available to the reader.

I. Why The Need

The most heated arguments in many circles of the military at the US Army War College stem around the capabilities of the modern force structure to project itself where needed throughout the world. One side laments that too much emphasis is placed on the European scenario, tying down all our equipment through POMCUS, leaving little to train with and no way to get it to other troubled spots throughout the world; literally putting "all our eggs in one basket"! Others stand firm that this demonstrates in the least expensive way our commitment to NATO and our allies and we are moving into the "Army of Excellence" or the "Light Division" concept through which we can rapidly deploy to any trouble spot in the globe with existing airlift capabilities (550 sorties per movement of one (1) division by C141's) hence projecting our power and meeting the requirements of the SecDef and the President for prosecuting one and one-half wars. However, there is commonality of agreement between the two opposing factions concerning the Light Infantry Division of the Army of Excellence and this is what this paper is going to address, "Sustainability of the Light Infantry Division, by augmenting the light armored vehicle."

To do so we will first acknowledge that both types of divisions, heavy and light, are needed in the scenarios facing US forces today. Also that playing catch-up as far as modernizing the military is concerned is taking the max dollars the U.S. can afford to spend in a peacetime environment without undue stress on the recovery of our present economy. The assets are available and with present technology it is the way to go now in the 1980's and early 1990's. Now based on these strategies, how can we make the "divisions" in questions the most viable and potent on the battlefield of today?

The Heavy Division has the most formidable combat power ever placed on the battlefield under one commander in the history of warfare. Its maneuverability and sustainment is totally satsifactory but because of its size and weight it

must be prepositioned and placed in an area where its full potential can be exploited. Parts of the European scenario meet all these criteria. Parts of this type division)the heavy Division) can be transported to other areas of the world but it's a slow process and at great expense.

Now the Light Division is potent in numbers, not encumbered by large overheads, highly transportable from this land to foreign soil but lacks staying power once it arrives. The American fighting man who makes up the Light Infantry Division (hereafter referred to as the LID) will be the finest trained human fighting machine the world has ever seen. He will be airborne and ranger trained, capable of handling all weapons and munitions in the inventory and led by the finest senior officers with combat experience from the Vietnam era. These officers know and understand the hardships of ground combat in adverse weather conditions in foreign lands where the enemy is not always in a bright red uniform and his lines easily defined. The LID will have everything going for it except survivability. Now how can we talk about such a formidable force that can't survive. Allow me to quantify this statement. It can go into a country uploaded and ready, it will have an artillery capability, and a limited anti-armor capability. However, that limited anti-armor capability is where the major problem lies. In any potential troubled spot on the globe today, Nicaragua, Cuba, Southeast Asia, Africa, et al, armored forces manning BRDM's, medium and light tanks, and other armored vehicles are prevalent. The LID cannot stand in its present configuration against light and medium armor in the quantity found in these countries today.

This paper is intended to correct that imbalance through quick-fix units, available off the shelf that can be in the hands of troops in two to three years and employed with the LID as attached, OPCON, or a follow-on force capable of providing the sustainment necessary for the LID to survive. I'm talking about Light Armored Vehicles hereafter referred to as LAV's.

II. The Threat

Since the LID will presently use unarmored, nonswimming mounting anti-tank, mortar, Vulcans and sundry other weaponry we can see the disparity in force as compared to our most likely adversaries. The LID is clearly contrary to world trends which emphasize increased mechanization of ground forces including light infantry and increased numbers of tanks. The Soviets who provide equipment and tailor the forces of their world countries under their dominion whom we are most likely to fight place the LID at an extreme disadvantage.

Soviet Light Infantry including marines, ride in BTR-60/70 eight wheeled IFU's and the Soviet Airborne have BMD-1 airborne IFV's. In addition, these troops and other unfriendly Third World countries are equipped with 122mm howitzers, 122mm rocket launchers, 152mm gun howitzers. Each one of these systems employed as part of the adversary's fire-support plan can be devastating against great soldiers with no capability to counter the threat. Man vs man we can win, man vs BRDM-60/70 or T55/85 or T62's provides a different aspect and one which must be addressed and today can be rebalanced. I am not advocating a change to the TO&E of the LID but based on the present day threat I wish to recommend an armored umbrella which is necessary to counter "the" threat and recommend its use as an "add on" as the factors of METT's determine the "need." The "fix" recommended will include the composition of the fixing force, the recommended deployment of it when attached or op-con and the capability of this fix to deploy within a time frame again determined by the factors of METT's. The recommendation is based on the off-the-shelf availability of LAV's presently being used in our Marine forces and all other countries. It is also based on the assumption that LID will have a place on the modern battlefield especially in heavy jungle or mountainous terrain as found in Korea, and that the navy will not produce the fast transports necessary to move a Heavy Division in the same amount of time that the LID can be transported. It is based on the facts that

C130's, 141 Starlifters, and C5A's in conjunction with the civilian fleet of 747's, DC10's, and IL 1011's can carry one to seven LAV's, depending on which aircraft used, into the combat zone where necessary airfields have been captured or held by advanced forces of the LID. It also takes into consideration the necessary air support by the TAF's and the LID helicopter gunship and transport available. This total combination thus adds to the sustainment required for the LID.

III. The Light Armored Vehicle (LAV): Types Available Today!

A. LAV 25 (Annex A). Nearly every potent armed force in the world today has an LAV either in the wheeled or tracked configuration. The US Marine Corps has a wheeled LAV in several configurations enabling this force to still be highly mobile and sustaining in a combat environment. The marines have chosen over all other competitors the eight wheeled armored vehicle called the Piranha. This is a multi-roled vehicle mounting several different types of weapons systems, carrying infantrymen and cheaper than the M113AM, IFV M-2 and CFV M-3. It is a lower silhouette designed vehicle that can swim, be sling-loaded on a CH53 helicopter and moved in aircraft and hovercraft. The primary weapon is the 25mm Chain Gun with a 7.62 mounted co-axially. Other systems include a 40mm grenade launcher, 81mm mortar carrier and a C^3 vehicle. The piranha is manufactured by General Motors Corp. of Canada. There is experimentation on the way for a 105mm gun turret mounted on the LAV.

B. V-300.(Annex B). A close second was the Cadillac Gauge System which presently mounts a 105mm Low Recoil Force Gun which fires the same round as the M1 Tank. This eight wheeled vehicle can travel over improved roads at speeds up to 52 mph over 400 miles on one tank of gas. It carries 34 rounds of main gun ammo, 1000 rounds of 7.62 ammo, 300 rounds of Cal. 50 and has a crew of three. It weighs 37,500 lbs. and is propelled by a 270 hp turbocharged V8 diesel. The turret is stabilized for firing on the move.

C. Other systems available now, off the shelf, and in production as the two above are: The Commando Sting Ray (Annex C) - full tracked light weight, 105mm Carnon, transportable by C130 aircraft, already tested by Cadillac Gauge Company. The turret from the Sting Ray can be mounted on existing M551 Sheridan chassis (Annex D). The M113A1 a the wheeled version can also mount this weapons system.

D. Another system already on the shelf is the French TS90 (90F4) gun system (Annex E). This weapon system fires seven different 90mm rounds with such velocity as to match the kenetic energy capability of medium tanks mounting 105mm guns. It has a maximum effective range against any known armor in the field up to 1650 meters. The penetrator of the armor defeating kenetic energy round is tungsten carbide. The HEAT round has an effective range to 1100 meters. Again, history tells us these are maximum ranges most tank vs tank combat takes place. This system can be mounted on existing M113's, LAV25's, Cadillac Gauge Vehicles of the 8 x 8 class -- the Tourelle TS90 Turret is a 2 man turret and weighs 2.5 tons. Mounted on a 10 ton chassis this gives us a 12.5 ton vehicle or 27,000 lbs capable of being airlifted by a CH47.

E. Getting down into the exotic is a 14.8 ton light tank mounting a 75mm cannon, rapid firing, automatic loading and capable of air-defense as well as direct armor defeating capabilities (Annex F). It carries 60 rounds of ammunition main-gun and 2600 rounds of 7.62mm. It can either have a manned or unmanned turret. The horsepower per ton ratio is 24 which gives it a max speed of 40 mph with a cruising range of 310 miles. Its transportable characteristics are 8 per C5A - 2 per C141, 1 per C130. The new 75mm ammo designed for this system incorporates a kenetic energy round that can defeat any known enemy armored vehicle in the world today at ranges up to 1500 meters. Again this is within the fighting range experienced.

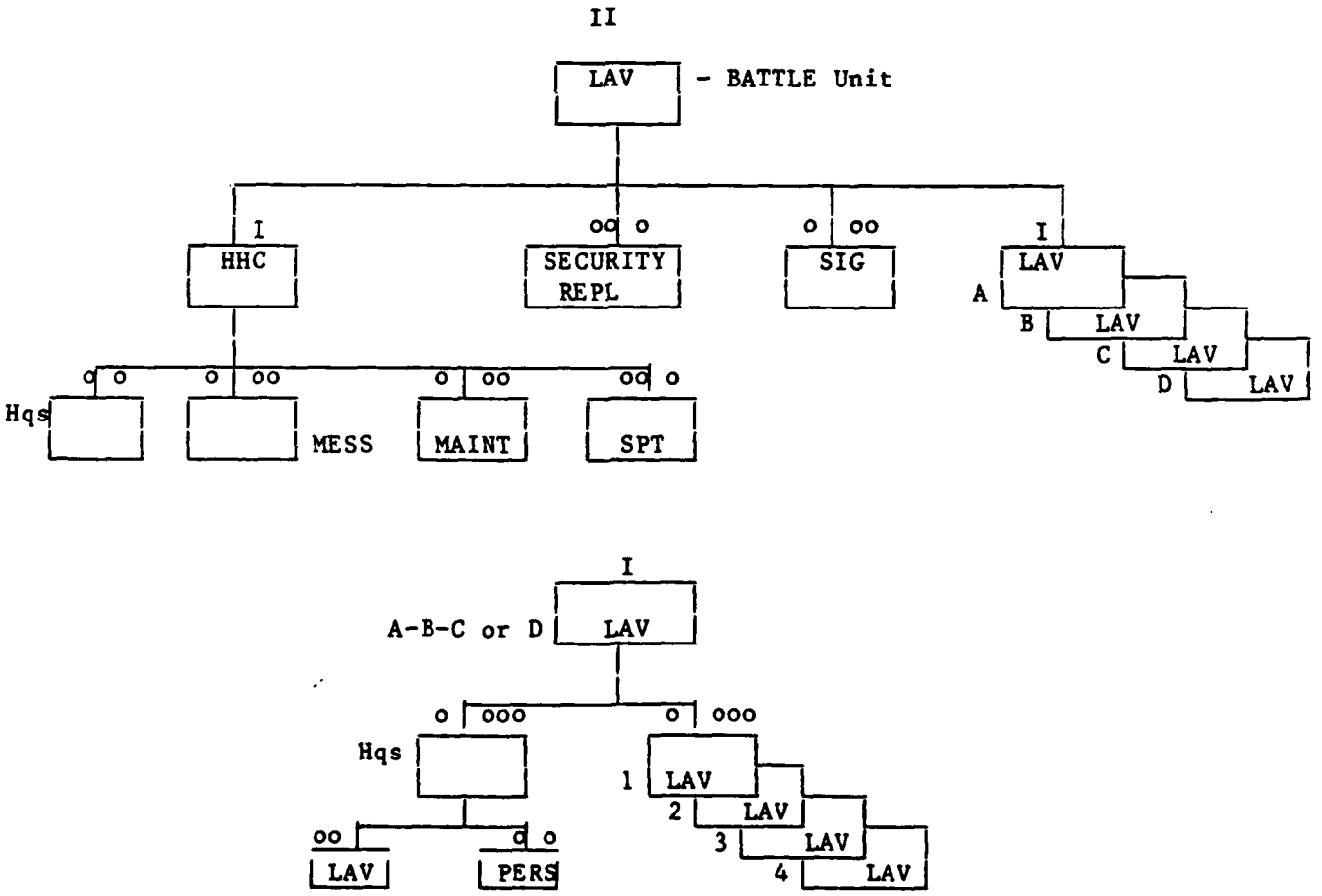
F. Another vehicle designed by the French is a 6 x 6 wheeled vehicle called the AMX 10RC (Annex G). It mounts a 105mm high velocity gun, carries a three-man crew, and is designed for both day and night combat. It can be used without external lights up to ranges of 1000 meters while the target is moving. It can swim and it is without a doubt one of the best LAV available off the shelf today. It's presently in production and being ordered by many countries around the world.

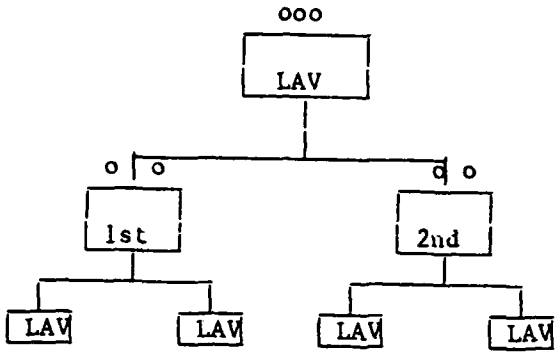
G. The last vehicle discussed herein, again on the shelf, is the Steyr X-SGT 105 turret (Annex H). This prototype is presently mounted on the SK 105 chassis. It is stabilized, has an automatic loader and uses a 2 man crew in the turret plus whatever number are needed to run the chassis. The SK105 chassis has one driver giving us a 3 man crew. The J3 version fires the same 105 rounds as the M1 and M60 series tanks. What makes this automatic loading system viable is that it's stabilized like the gun is, hence the gun doesn't have to return to any neutral position to be loaded therefore it stays on the target once engagement begins until target destruction. The total weight of turret and chassis is 20 tons. Again this vehicle meets a requirement to be transported by C5A's, C141's and C130's that are now in our inventory.

IV. BATTLE Units for the Army of Excellence.

To restructure the Light Infantry Division to accommodate mechanized equipment would defeat their basic purpose. The 10,000 man fighting force would be augmented under my proposal by one or more BATTLE units as required by the factors of METT's, Mission, Enemy situation, Terrain and Troops available. The BATTLE units are separate light armor battalions with sufficient armor protected gun power capable of rapid deployment immediately with or after the the LID's deployment to any place in the world by C5's, C141's, C130's, the civilian fleet 747's or IL 1011's etc. These weapons designated Light Armored Vehicles or LAV's, are in the light under 25 ton bracket but have the capability to mount cannons that are exactly the same as found on our M1 and M60 series tanks today.

The BATTLE units would train to the mission. They would be similar to tank battalions in the need for tank gunnery but because of the recommendation that they be wheeled vehicles and would have the primary responsibility of protection they could train anywhere, anytime without the restrictions imposed by tanks with treads. The BATTLE units would be a complete package capable of training and deploying in an absolute minimum of time producing the firepower of a tank battalion less the armor protection of the medium tank but with the agility and speed which trained for can counteract the need for heavy protection. It would be interdependent upon the LID for combat support but would bring with it its own service support basic load. The division DISCOM would when planning incorporate any needs for the BATTLE units for sustained combat support and combat service support. The Battle unit would be configured as follows.





Recommended TO&E

a. Battalion Headquarters (4-Off; 1-WO; 19-EM)

1. CO-05
2. XO/S-3 - 04
3. S-2 - 04
4. S-4 - 03
5. E-9 CSMaj
6. E-8 S-2 Sgt
7. 1-E-8 S-4 Sgt
8. 1-E-8 S-3 Ops Sgt
9. 1 WO3 - S-1
10. 1 E-7 Personnel Sgt
11. 6 Clerk/Drivers (6-HUMVEES)
12. 2 crews (3 man or 4) LAV's.

b. Headquarters Company.

1. Hqs Section: (2-Off; 4 EM)

(a) CO = O-3

(b) XO = O-2

(c) E-8 = 1st Sgt

(d) 3 clerk/drivers

2. Mess Plt: (46 EM)

(a) Platoon Sgt E-8

(b) 4 E-7 Team Leaders

(c) 1 E-7 Asst Plt Sgt/Team Ldr

(d) 20 E-6 - E-4 1st Cooks

(e) 5 E-4 Mess Truck Drivers

(f) 15 E-4 - E-3 Cooks Helpers

3. Maint. Plt: (1 Off; 1 WO; 20 EM)

(a) 1LT Mtr Officer

(b) W2 Maint Warrant

(c) 1 E-8 Motor Sgt.

(d) 5 Turret Mechanics E-5

(e) 5 General Mechanics E-6

(f) 5 E-3 Wheeled Vehicle Drivers (LAV Retrievers)

(g) 4 E-7 Mtr Sgts.

4. Support Platoon (1 Off; 26 EM)

(a) One LT Plt Ldr

(b) One Plt Sgt E-7

(c) 5 Sect Sgts E-6

(d) 10 Drivers/Handlers Supply E-4 or 5

(e) 10 POL man section E-5's

c. Security Platoon (Replacements) (27 EM)

(1) Plt Sgt E-7

(2) 3 Sqd Ldrs E-6

(3) 21 Squad Members/Tankers

(4) 2 - 5-ton Truck Drivers

d. Signal Platoon (1 Off; 41 EM)

(1) Commo Plt Ldr - Capt O-4

(2) Plgt Sgt E-8

(3) 5 teams of 8 men w/equipment (E-7 tm ldrs)

e. LAV Company (6 Off; 64 EM)

(1) CO - Capt (03)

(2) XO (O-2)

(3) 1st Sgt E-8

(4) 3 Drivers Wheeled Vehicle

(5) 4 O-1 or 2 Plt Leaders (TC's)

(6) 56 LAV drivers/gunners/TC's (4 man crew)

f. Personnel Totals: (Battalion)

Off	WO	EM
33	2	449

g. Equipment totals

(1) 68 LAV's w/105mm Low Recoil HV gun

(2) 53 5 ton trucks w/trailers

(3) 5 LAV Retrievers

(4) 25 HUMVEE's w/20mm turrets

h. C-5A's necessary to move one BATTLE unit

(1) 8 LAV's + 1 5 ton + 3 HUMVEEs per C-5A

(2) Total C5A sorties per BATTLE unit.
15 C5A's.

V. Comparisons - LAV's and Systems.

Make	Cal. Gun	Wgt Tons	Auto Ldr	CHASSIS	Speed
MOWAG SHARK	105mm	23.1	Yes	8x8 wheeled	60MPH
CMDO V-300	105mm	19.4	No	6x6 wheeled	52MPH
CMDO STING RAY	105mm	19.4	No	Full Track	43MPH
AMX 10 PAC 90	90mm	14.5	No	6x6 wheeled	52MPH
AAI-Rapid Depl. Tk	75mm	14.8	Yes	Full Tracked	40MPH
AMX 10 RC	105mm	15.8	No	6x6 wheeled	60MPH
JT/3 Turret/SK105	105mm	10.4	Yes	Full Tracked	42MPH

NOTE: There are several variants of the above not mentioned nor are Third World or USSR variants compared. Only present, in production, off-the-shelf, ready-now vehicles are compared. Experimentation of gun systems should be continued and technology as it progresses should help determine the ultiamte LAV.

VII. The optimum package into the 1990's. We have got to settle down and train to fight with the present equipment and units we have. The fine tuning necessary to overcome the turmoil the influx of new equipment has caused must be overcome now. The mistakes will be overcome as newer technology or the maximizing of present technology takes hold. To get into the 1990's with no more changes is perhaps the only way we can stay viable. This, coupled with the eventual cutback on defense spending, a peace-time dilemma, which permeates our type of society dictates we begin to learn how we should use what we have on board now. The TO&E of the light division can stay as is and the attachments, as dictated by the factors of METT's, can be done cheaply with off-the-shelf weaponry cutting back on R&D costs making the buy palatable to the public and yet necessary to sustain the needs of the Army in this decade. There is no better piece of equipment more capable of performing the missions required by forces needed to be projected many thousands of miles from its base, rapidly by air predominantly and with what's in the inventory today than the LAV, wheeled, in the configuration of the BATTLE unit described above.

It's a perfect marriage and gives the LID a sustaining feature unexpected and inexpensive both in manpower and equipment. These BATTLE units can be formed in the Reserves and in the active force. The ideal would be two BATTLE units on active duty, four (4) BATTLE units in the National Guard and two (2) BATTLE units in the Reserves. These eight units could be expanded upon during wartime but would be sufficient for the present force.

These units would perform all training under the Armor School as Cohort Battalions which would build moral and Esprit faster than any other unit ever formed. They units would be trained to move fast, hit hard and prepare to support by fire at any location on the battlefield. They would also have many other uses in the European scenario as well as Third World scenarios. No better

type unit can be envisioned for Corps rear area battles. Corp GS/DS units which would be tasked for RAP Missions would have its own lethal punch, greater than the enemy forces we'd be facing into the 1990's giving us the edge this time. They could also be used as a Corps plug for any minor breakthroughs where additional firepower moved rapidly over land or roads could be the turning point in a battle.

Every army of any size or consequence in the world today utilizes an LAV on wheels. The US Marine Corps has them and we in armor must understand the tank as we have always known it can be as viable, more sustaining mechanically, and although not as heavily gunned or armored can be in another configuration besides tracked. Maintenance on tracks today is as bad as when we first started building tanks prior to WWI. Modern technology has never kept pace because the only piece of equipment needing tracks is in the military and modern business find very little profit in producing special treads which can withstand the pounding given a 60 ton vehicle capable of speeds in excess of 45MPH over rough terrain.

The ideal LAV would be one that possessed the following capabilities:

1. Fire and forget round capable of defeating anything at any range that is seen
2. Invisible to electronic seeking anti-tank missiles
3. Crew of two. Robotic repair for tracks
4. Never needs fuel runs on solar energy
5. Can attain cross country speeds of 100MPH
6. Costs under 1 million dollars per copy
7. Can fire under any weather conditions.

As facetious as it may sound it would be the ideal piece of equipment. Since this technology doesn't exist yet today and the fix is needed now, a LAV off the shelf is recommended. We can beef up the LAV by appliquing it with additional armor to add to its sustainability. To those who would argue that this causes extra weight and makes these vehicles less transportable I must agree. However, after the BATTLE units are in place, and aircraft free up for logistics purposes, the "hang-on" armor can be delivered just as fuel is and put on the LAV for added protection. We get the rapid mobility, the firepower necessary, and add to the capability of the Light Infantry Division to perform its mission. The "motto" of these BATTLE units would be .....

<u>CAN DO</u>! <u>LET'S GO</u>!

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