

AFV camouflage and concealment

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Introduction

A large proportion of battlefield information is gained through visual means via line of sight and beyond line of sight sensors. As such, armoured fighting vehicles (AFVs) must be proactive in the art and practice of camouflage and concealment. Generally, combat reconnaissance vehicles (CRVs) are pre-emptive when it comes to camouflage and concealment due to the nature of cavalry tasks. Main battle tanks (MBTs) and, to a slightly lesser extent, armoured personnel carriers (APCs) are high-value targets and are often the centre of gravity for a combat team. All AFV crews must be exponents of vehicle camouflage and concealment to maximise their counter-surveillance capability during training in order for these techniques to become second nature while on the battlefield.

Camouflage and concealment

Direction of surveillance threat. The threat of surveillance on AFVs from the air can be high and therefore concealment measures must be adopted. If appropriate steps are taken to conceal vehicles from the air, additional measures taken to prevent detection from the ground can be minimal. If the ground threat is high, greater emphasis should be placed on protection rather than increased concealment. This could be the deciding factor on whether a hide or harbour is established by the commander. In any case, counter-surveillance techniques must be key planning factors.

Two main camouflage methods. 2nd Cavalry Regiment SOPs state two main methods of AFV camouflage can be used. These are the 'shaggy dog' (a combination of shredded hessian, DPCU cloth and camouflage net) and 'natural cam' ('Don 10' wire or fencing wire crisscrossed around the vehicle in order to provide an anchor point for natural foliage). Most cavalry sub-units have been observed utilising a combination of both.

Refresh camouflage. Due to the harsh nature of activities conducted by AFVs, camouflage must be continuously refreshed. Whether shaggy dog or natural foliage is being utilised, it will degrade within hours and therefore must be maintained whenever possible. Even if it remains fastened to the vehicle, the natural camouflage will degrade after two or three days and must be replaced.

Need to be able to use weapons. Regardless of the posture or security stance taken by the organisation, AFVs must be able to utilise available weapon systems and suites of sensors while concealed.

Practise camouflage. Camouflage and concealment must be continuously practised. This can be done within the barracks environment and can be enhanced with the use of unmanned aerial system (UAS) to enable an aerial view of the activity.



ACR members practice camouflage and concealment techniques in barracks utilising an UAS in order to assess effectiveness from the air as well as the ground.

Layout of camouflage nets

What is not made clear within doctrine or SOPs is the layout design of the camouflage nets to be used on AFVs. The more common method observed is to tie camouflage nets off to the sides of the hull and lay out the net in a 'skirt' fashion, with another cut down net used independently for the turret. Another method not typically used on AFVs is the 'garage' method, where the net has no contact with the AFV and is independently supported by poles and pegs. The AFV is then parked beneath like a car in a garage. There are pros and cons to both methods:

- The skirt method allows for excellent ground camouflage and concealment and also allows the turret to fully traverse and main weapon systems to be used while the AFV remains static. It is quick to deploy, and can be developed in stages, depending on time in location and enemy threat situation; however, this method takes approximately five minutes to collapse and the AFV, while the nets are deployed, cannot jockey without destroying the nets and risking them becoming entangled within the drive train of the vehicle. It also proves harder to conceal what is beneath the net from the air, and crew access to most parts of the vehicle is restricted.
- The garage method gives excellent concealment from the air and ground, and allows ease of access to all parts of the AFV. It is easy to open and allows the AFV to move if required, although this would mean the AFV is left without a camouflage system unless fully collapsed; however, turret traverse is very restricted to between 2 and 10 o'clock, and there is the risk of the net collapsing if the main gun is fired from within the net. It does not camouflage the vehicle from ground level as well as the skirt method does, and it takes longer to erect and collapse.

When it comes to the style of camouflage net setup to be used, it is generally dictated by the sub-unit commander, but consider *LWP-CA (MTD CBT) 3-3-1, Mounted Minor Tactics* (paragraph 4.31) that states '*With the exception of within buildings in urban areas and beneath high jungle canopy, the threat of surveillance of AFVs from the air is high and therefore concealment measures will be adopted*'.

If the main threat of enemy observation is from the air, the garage style of camouflage net would provide the best camouflage. If the main threat of enemy observation is from the ground, the skirt style supplemented with natural foliage appears more effective. If the ground threat is high, a harbour may be better suited over a hide but camouflage and concealment must still be a key planning factor.



2nd Cavalry Regiment CRVs using shaggy dog and natural foliage to camouflage their hide. Note the large rocks to the front that would help disrupt the vehicles' thermal signature.

Camouflage MBTs

As high-value targets, MBTs must employ the best methods to conceal their positions, especially while static. Due to the extreme muzzle flash and high exhaust heat produced by the M1A1 MBT, the usual technique of camouflaging AFVs (the shaggy dog) proves untenable due to this system being highly flammable. AFVs, especially the MBT, require a purpose-designed camouflage system that has an extremely high flash point. Although there have been trials on such a system, nothing has been commissioned into service.

While the designated storage position for a camouflage system on an MBT is quite difficult to access, there may be provisions made via their A1 echelon to deliver these stores once static or, preferably, the troop should conduct an admin hide prior to the tactical hide in order to position the camouflage system for quick deployment on arrival.

Use of ground for MBTs has been of a good standard but this is only an effective concealment method against ground-based intelligence, surveillance and reconnaissance (ISR).



LEFT: 2nd Cavalry Regiment MBTs use hull down firing positions to provide cover and some concealment. Note the extreme muzzle flash produced. RIGHT: An MBT uses the shaggy dog camouflage method.

Key considerations

Night. Due to the availability and quality of modern day thermal imaging and image intensifiers, the requirement for AFVs to maintain camouflage during the night has never been more important. Previously, it would be common practice to collapse camouflage nets when preparing for night routine but this now needs to be questioned as a viable option. In fact, concealment by night should be enhanced rather than reduced, due to the quality of thermal imagers and the fact that AFVs will retain heat longer than the natural surroundings. Many troops have been observed not using camouflage nets in hides by night. This was due to the threat and the time it would take to pack up if they were required to break hide; however, the argument could be made that if a troop were in a hide rather than a harbour, the threat of being pushed off the position should be minimal. As sound generally carries further at night than during the day, enemy vehicles could be detected earlier; therefore, if required, a troop would actually have more time to collapse the position by night than they would during the day. With most modern UASs having a thermal capability, camouflage nets are a valid requirement by night.

Terrain. Terrain will have a massive impact on camouflage and concealment. When working in sparsely vegetated terrain, camouflage nets may not provide effective camouflage for a vehicle; although if used correctly, they will provide concealment. Concealing what is beneath a camouflage net will place doubt in the mind of the enemy and affect the enemy's decision-making cycle. This is not an easy task for AFV crews, as it is not as simple as setting up a net. There are still multiple indicators available to enemy ISR that there are AFVs being concealed including vehicle tracks, the size and spacing of the position, vehicle antennas protruding through the net, and the physical location of the position could indicate a mounted element.



2nd Cavalry Regiment APCs use dead ground to provide concealment. Note the tracks leading into the position have not been camouflaged.

When working in heavily wooded or jungle terrain, concealment from the air may not be required as the canopy could prevent effective enemy aerial surveillance. Heavily wooded areas would, however, leave sign that is more significant on the ground, leaving the force more susceptible to ground ISR follow-up and the need for deception would therefore be higher.

It has been observed that deception plans from mounted forces have been minimal in recent times and this is something that needs to improve. Something as simple as creating a dummy track 50 to 100 m past the hide and covering the tracks leading into the hide from the dummy track could give a survivable advantage to a mounted force over ground recon elements.

Tips

1. Liaison with ISR elements (such as cavalry surveillance troop, aviation ARH crews or infantry recon platoon) to identify the different types of sign they look for will help improve camouflage and concealment techniques for an AFV unit.

2. Use available UAS assets while practicing camouflage and concealment techniques to gain an aerial view of your position.
3. Wet sandbags or tarps laid over the hot areas of an AFV can significantly aid in the reduction of thermal signature. This technique is most effective in ambushes where the erecting of camouflage netting may not be a viable option.
4. An electric pole saw or chainsaw will provide a quick and relatively quiet solution to retrieve natural vegetation for the use of camouflage and concealment. This was recently observed in use by an ACR surveillance troop to great effectiveness.

Future

The plan with L400 Phase 2, Block II, is to introduce a limited number of SAAB Barracuda Mobile Camouflage System (MCS) kits as an optional fit for RTS and operational activities. If this proves successful, it could see a flexible solution for not only Boxer CRVs, but all AFVs to have a purpose-designed, multi-spectral camouflage system that provides protection against detection and identification. SAAB claims the signature management properties of the MCS provides stealth capability in the visual, near infra-red, thermal infra-red and broadband radar wavebands. By dimming sensors, obscuring targeting and fooling smart munitions, it will provide a tactical and operational advantage.

The non-glossy, three-dimensional surface structure of the MCS helps the vehicle blend in with the surroundings and obstructs visual detection. Colours, near infra-red values and pattern can be adapted to the environmental conditions of the intended region. Conspicuous parts of the vehicle can be furnished with additional contour disrupters, helping the vehicle remain below the detection threshold.



Boxer CRV fitted with Barracuda MCS during Land 400 Phase 2 Risk Mitigation Activity.

Conclusion

Generally, AFV crews start each exercise with a high standard of camouflage and concealment; however, this standard often degrades after a five day period. It takes a substantial amount of effort to maintain, and

commanders at all levels must enforce camouflage discipline. Remember that AFV camouflage will quickly degrade regardless of the method used. It has been shown that units which maintain an acceptable level of camouflage and concealment have been known to remain under the detection threshold for longer than expected periods.

As for the future, AFV camouflage and concealment requires a purpose-designed system designed for each AFV type. It must be durable, fire retardant, break up thermal signatures and be easily replaced.

References:

LWP-CA (MTD CBT) 3-3-1, Mounted Minor Tactics, 2020

LWD 3-3-4, Employment of Armour, 2016

2nd Cavalry Regiment SOP 2016

CTC Observation Reports Brolga Run 2020

SAAB website – www.saabgroup.com