

An All-Wheeled Scout Option?

Marines Mix LAVs with Mountain Bikes

by Captain Kelly P. Alexander

Using bicycles in military operations is nothing new. The French used them in WWI, the Japanese in WWII, and the Vietnamese along the Ho Chi Minh Trail. But in conjunction with armored operations, the choice has traditionally been the motorcycle and/or sidecar, the classic example being the German 7th Panzer Division's employment of motorcycles for reconnaissance in the invasion of France in 1940. Motorcycle-mounted troops seized key terrain, bridges, and intersections, and then armor moved forward to occupy the positions before the French could react. This two-wheeled option enabled German forces to add great mobility and flexibility to their operations.

While several recent experiments using mountain bikes were successful, those experiments failed to gain much attention. In April of 1997, Charlie Company, 1st LAR embarked on a self-generated experiment to test the viability of mounting mountain bikes on the LAV and employing them with scouts during light armored reconnaissance (LAR) operations. In December 1997, the company received the support of the Marine Corps Warfighting Lab and Marine Corps Systems Command to conduct a Limited Technical Assessment (in the form of ten mountain bikes) for continued research and development.

Concept Development

The LAV is fast. It can project power and presence forward quickly and efficiently. It can project in depth and be sustained, as demonstrated during Operation Deep Strike in August of 1997. In the company form, LAR can bring to bear firepower rivaling an entire light infantry battalion. That is not to say LAVs are the panacea for every tactical situation, because they are not. However, Light Armored Reconnaissance, in conjunction with scouts, deployed in pairs on mountain bikes, offer several advantages.

In April of 1997, we began to experiment with mountain bikes and scout em-



- Author photos

ployment. At first, we used two bikes donated by marines within the company, and compared their performance to that of our foot-mobile scouts. We did little more than paint these antiquated bikes flat black, rig the bikes to the left side of our LAV-25s, using existing brackets and bungee cords, and move out. The bikes proved to be quick and quiet, and their light weight offered encouraging results. We tripled our efficiency in conducting route and zone reconnaissance missions when compared to the foot-mobile scouts. On several major exercises (Kernel Blitz, Operation Deep Strike, and JTFEX), the mountain bikes projected forward with such speed and security that LAR was able to arrive and seize key points literally hours before "scheduled" Red Cell elements were in position.

The advantage was faster reporting and an abbreviated OODA loop process. While the bikes in no way eliminated the need for ground mounted reconnaissance, they did — when the situation permitted (i.e., the threat was moderate to low) — allow LAR to cover terrain quickly and securely. Perhaps the biggest advantage the mountain bikes offer is the increased situational awareness and the heightened probability that commanders would receive reports faster, enabling the leader to make his decision before the enemy reacted. In summary, the mountain bike option contributed to a more rapid decision-making process for commanders at all levels. The LAV commander determines, based on METT-

TS&L, whether or not the situation is appropriate for mountain bike employment. Based on nearly ten months of experimentation, we have determined that mountain bikes, in conjunction with Light Armored Reconnaissance operations, are a viable consideration both on the modern battlefield and in Stability and Support Operations.

Tactics, Techniques and Procedures. Reconnaissance and security operations are extremely time-consuming, often slowing the main force. If the higher commander becomes frustrated, the reconnaissance may be conducted hastily, thus sacrificing speed for security. Mountain bikes offer more timely reconnaissance while maintaining an acceptable degree of security.

Organization. Currently we employ twelve mountain bikes, six bikes per line platoon (LAV-25). The bikes are mounted on the left side of the vehicle, on existing mounts and bike mounts constructed by our company welder. The bikes are secured with bungee cords, the handle bars turned flush with the side of the vehicle. Hanging the bikes outside seems to cause very few problems — even when the LAVs are traveling on LCACs. The bikes do not extend beyond the buffer of packs or cammie netting which adorn the outside of a combat-loaded LAV. With the exception of one bike damaged when grazed by a tree in close terrain, transport on the side of the LAV has worked quite well. We are continuing to experiment with different

mounting options and apparatus. Currently, the scouts can dismount the vehicle, detach their bikes, and deploy in about seventy seconds. Remounting requires about two minutes.

Route Reconnaissance. Employed forward of the LAVs, a bike section consisting of two scouts on two bikes deploys to conduct the traditional tasks of observing and reporting. The scouts carry load-bearing vest, T/O weapon, and one PRC-119 radio per section. We have experimented with a variety of weapons such as the 9mm pistol (too little firepower) and the MP-5, which slung nicely across the chest of the rider but was still questionable due to its limited maximum effective range. We believe the answer may lie in the new M-4 short-barreled rifle, which will be more manageable yet maintain needed firepower capabilities. For communications, we carry the PRC-119, which is heavy and cumbersome, but we are in the process of acquiring Motorola radios. A new "adapter" allows the Motorola to be attached directly to a BA5590 battery, thus increasing the life span of the Motorola from seven hours to seven days (no more rechargers!). This "adapter" is currently being used by 2nd Reconnaissance Battalion and was the source of our information.

Depending on the threat, the scouts will travel on or off-road. Supported and overwatched by their own LAV-25s, they ride forward to observe and report. Prior to their departure, they receive the standard "Ranger" five-point contingency plan from their vehicle commander so that, in the event that enemy contact does occur, a future link-up can occur at a predetermined rally point. The remaining two scouts stay with the vehicle, providing security. If the threat is high or contact expected, the bikes may not be a consideration and the four members of the scout team deploy forward on foot. If the threat is moderate or low, the scouts may detach their bikes, proceeding forward by bounds, terrain masking and conducting mounted or dismounted crest drills along the way. A crest drill is nothing more than concealing or caching the bike on the reverse slope and crawling forward to observe, presenting a minimal silhouette.

In a matter of a few minutes, reports are flowing back to the platoon commander, the company commander, the battalion commander/BLT, and finally the division or MEU commander. What previously took hours to achieve, we now conduct in minutes, quickly and se-

curely. The bikes at 3000m and less (the max. effective range of the LAV-25) begin to report the situation ahead. If the route is clear of obstacles, the key terrain unoccupied, or the bridge unguarded, the scout radios the vehicle to move forward, and in minutes the position is owned by an LAV.

If the route requires obstacle reduction, the scouts on bikes are able to give advanced warning as to obstacle location and composition without having a vehicle in proximity to be engaged by direct or indirect fires. Engineers are brought forward, if beyond the scouts capabilities, and the bikes continue forward on the flanks to provide an added buffer during the breach or obstacle reduction. While a myriad of tactical scenarios are applicable, the bottom line is this: the bikes provide a means to push farther forward in a timely fashion, allowing LAR to have that crucial "reaction time" that is critical in all mechanized operations. The rate of reconnaissance has tripled when using our mountain bikes. A route recon also includes the investigation of areas adjacent to the route which may influence it, to include defiles and lateral routes. The mountain bikes allow us to observe and report on these areas without committing an LAV, thus enabling us to focus our firepower forward, rather than dispersing it laterally.

Zone Reconnaissance. Perhaps the most difficult and challenging type of reconnaissance, zone recon, also requires the most time. Here, the bikes are invaluable as they scour the area, moving forward, laterally, and sometimes backwards to investigate. Although not as detailed as a reconnaissance conducted on foot, the decision to deploy the bikes is based on two things — terrain and enemy threat. Perhaps one of the greatest assets the bikes provide is a quick, quiet, and easy insertion and extraction into the immediate AO. Whereas previously the LAV would easily compromise both the vehicle and the scouts because of its noise, the mountain bikes enable the scouts to disembark at distances over a mile away. This, in addition to our new "silver series engines," permits LAR scouts to conduct their reconnaissance quickly and quietly.

Security Operations (specifically screening operations). The mountain bikes are used to conduct mobile patrols on the screen line, confirm grids using a "plugger" for engagement areas, and mark target reference points (i.e., chemicals, air panels, etc.), conduct time/distance analysis between trigger lines and

break lines, all in a mobile fashion. To the rear of the screen line, the bike-mounted scout is able to confirm routes back to subsequent battle positions, conduct time/distance analysis, recon and mark battle positions, as well as "plugger" future "on-call" targets for use during anticipated defend or delay missions.

The bikes can be incorporated into convoy operations as well as rear area security missions using scouts to provide mobile patrols and early warning from this mobile platform.

Observation Posts. Before, LAR scouts were limited to the distance of the scout/vehicle tether. With the bikes, we are able to extend the length of the tether greatly and push them farther forward, allowing them to observe, report, and in some cases initiate engagements with indirect fires and CAS; then egress back to the vehicles under cover of the LAV-25s and LAV-ATs. It enables us to emplace hasty obstacles and overwatch them at greater distances, thus allowing us to better shape the engagement area towards our decisive point. In a defensive posture, the bikes are useful in emplacing AT mines or providing mobility for monitor/survey teams as they investigate the extent of an NBC attack.

Raid. The bikes are used to recon the route to the objective rally point (ORP), recon the ORP, and, if needed, they can be cached so the scouts can continue on foot to the objective. Either way, the bikes again offer a new dimension to tactical mobility and security.

Operations Other Than War. Perhaps the bikes' greatest usefulness lies in their utility during MOOTW situations. Outwardly, the bikes offer a non-threatening posture. In reality, a 25mm Chain Gun lurks in the shadows up to two miles away, ready to respond at a moment's notice.

Scout management. This is the term for the scheduled introduction of scouts onto the battlefield at specific intervals, in order to preserve scout endurance, proficiency, and survivability. By employing the bikes in pairs, we are able to retain two scouts with/near the vehicle, keeping them fresh to rotate in on the bikes, as the commander may direct. Before, we would deploy the entire four-man scout team on foot. Even for the fittest, a 25-mile route reconnaissance during extended operations proved to be impractical. With the bikes, riding is potentially taxing, but offers more efficiency and yields consistent, reliable reports and results.



At left, scout dismounts his bike from mounting points on the LAV hull and prepares to move forward. As patrol progresses, the LAV crew, right, overwatches and remains ready to suppress. With lighter radios and shorter, M4 versions of the personal weapon, bike scouts would be even more effective, author notes.

Night Operations. Because the bikes are fast and quiet, they often proceed unnoticed. They are difficult to detect, identify or track, as they give off such a small thermal signature, and cover large areas in a short period of time. Scouts with NVGs are able to observe and report from several different locations in a matter of minutes, thus giving us better security and improving situational awareness. Between the scouts on mountain bikes and the LAV thermal sights, we are able to move quickly, securely, and strike accurately on extended frontages and depths. Especially at night, the mountain bikes offer not only depth to the battlefield but a new dimension.

RESEARCH and DEVELOPMENT

During Exercise Kernel Blitz, the mountain bikes revealed several tactical benefits. Attached to the outside of the LAV, the bikes weathered safely an 0300 flight on LCACs. Once ashore, in darkness, the bikes were pushed forward to recon key terrain. In 20 minutes, the bikes had seized and reported two key pieces of terrain dominating the beach area — a job that normally, on foot, would have taken 1-2 hours. Additionally, the bikes identified two enemy HMMWVs, which were then destroyed by quickly moving the LAV-25s into action under the guidance of the bike scouts. During the amphibious landing of Regimental Landing Team 1, the bikes provided key mobility as they achieved a crucial link-up with B Co. 1/4, alerting them to a potential ambush just inside a nearby canyon. Most notably, the bikes conducted a night movement to seize key terrain that the company prepared to occupy the next morning. Over ground that would have taken ground-mounted scouts 6-8 hours to recon, the bike scouts were able to advance quickly and quietly, at night, and

in two hours reported the entire three-mile area “all clear.” At this point, I was able to make the decision to occupy the ground immediately (2300, vice NLT 0900). As the sun rose the next morning, the entire company lay poised at an engagement area. The OPFOR entered the area just before 0700 and was destroyed.

OPERATION DEEP STRIKE. During Operation Deep Strike, the bikes were employed in a desert environment. While the bikes did not prove useful on soft sand, they did provide some key benefits on hard desert crust and harder packed roads. During a battalion-sized attack in the Lead Mountain area of 29 Palms, the bikes moved forward in the high ground to establish an OP overwatching the objective. The bikes were able to traverse the foothills and lava rock in a timely fashion and occupy the OPs to enable the company to further occupy a nearby attack position and then overwatch as the company moved into its support-by-fire positions. The scouts on bikes were also employed with MP5 submachine guns to offer firepower but reduce the awkwardness of carrying both an M-16 and a PRC-119. This experiment proved fruitful for the scouts as it allowed them to sling the weapon in front, resting against their chest, instead of slinging the awkward M-16 across the back. A point of interest: the LAV scout as well as the LAV crewmen should be outfitted with the new M4 5.56mm carbine versions of the M16. This weapon, with collapsible stock and short barrel, would maintain current firepower and make it easier to get on and off an LAV.

Transitioning to Operations Other Than War (OOTW), the bikes were employed in conjunction with vehicle checkpoint operations on the Colorado River. The scouts on bikes moved forward into the city of Blythe, Calif., and in conjunction with local law enforcement authorities,

conducted “house calls” to notify local residents of the U.S. Marine training checkpoint being conducted in the area. While the scouts conducted liaison forward, on mountain bikes, the remainder of the platoon, with its LAV-25s, established the checkpoint itself and positioned the vehicles. The checkpoint was successful; and with the mobility of the mountain bikes, this “flying” checkpoint was established within 10 minutes of arrival. The checkpoint processed 25 vehicles of various types in a 2-hour period.

MINI-CAX. Charlie Company conducted a “mini-CAX” (combined arms exercise) at 29 Palms with BLT 1/4. For the first time, we coordinated the employment of mountain bikes and live-fire operations. We conducted a raid in which a platoon conducted reconnaissance of the route, the objective rally point, and the objective itself using the mountain bike scouts under cover of darkness. This provided for a rapid and secure deployment of the raid force into the objective area while receiving real-time intelligence from the bikes on the objective.

In a separate and live fire evolution, during a company defense, we occupied a battle position in the vicinity of America Mine. Scouts on mountain bikes deployed to man observation posts 3600m forward of the battle position. Upon positive identification of the advancing enemy, the scouts initiated live-fire pre-planned and registered targets, our 81mm mortar variants delivering HE designed to suppress and mark the oncoming mechanized formation. We began to canalize the enemy into the outer edges of our engagement area. Once on target, the scouts remounted their bikes under the suppression of the 81mm mortars and moved back toward friendly lines in darkness. The bikes transited the desert floor (3500-3700m) in about 12 minutes,

and upon reentering friendly lines, we launched our first TOW missiles, separating the tanks from the armored personnel carriers. The LAV-25s conducted their direct fire engagements, and the 81mm mortar variants concluded with coordinated illumination and an FPF. While the focus of 29 Palms was to conduct live-fire and maneuver, our research continued to provide valid methods for the employment of mountain bikes in conjunction with the LAR missions.

MISSION: HAO. We used the bike scouts to establish initial “eyes on” on the refugee camp located at Warner Springs, Calif. The ambient temperature was about 50°F and raining. The scouts provided early reports as to the numbers, activities, etc. The bikes allowed us to close quickly and securely while keeping the vehicles at a distance of about 3000m — out of sight and out of mind of the unpredictable refugees. The bikes were used at night with NVGs to conduct mobile patrols in the vicinity of the camp; they were ideal because the bikes did not present the ominous presence of an armored vehicle, but offered an unseen buffer of security for both the company and the refugees. LAVs provided the catalyst to drop off foodstuffs.

With bike-scouts in overwatch, the “chow vehicles” (LAVs) moved forward, dropped off the MREs (from a secure and mobile platform), and bounded back. The mountain bikes departed the scene as the vehicles completed their offload, linked up with the vehicles at a predetermined rally point, and reembarked the vehicles — mission complete. When the crowd became unruly, the scouts in overwatch had the mobility to withdraw from the area quickly and safely under the cover of their vehicles.

We were able, in this environment, to experiment with bounding overwatch using bikes and LAVs. We held the refugees with the bikes and brought in the vehicles only when the situation deteriorated, thus complying with the ROE to present a “non-threatening presence” at the site.

The bikes operated at night in 30°F temperatures, rain, mud, fog, and some hail. They performed admirably with no maintenance problems.

MISSION: PERMISSIVE NON-COMBATANT EVACUATION OPERATION (NEO). Since the MSSG was delayed as a result of the weather; for four hours Charlie LAR conducted initial screening and in the form of a mini-Evacuation Control Center. Due to

overcommitments of assets and scouts needed for security and the manning of stations, we were unable to employ our bikes. In the future, we plan to employ them (in a permissive NEO) as mobile patrols on the fringes of the NEO ECC. They will provide mobile early warning, check out lateral routes, and occupy the key intersections, bridges, and waterways influencing the NEO site. Obviously, these positions would and could be reinforced by the vehicles in one simple radio transmission.

MISSION: SCREENING/SECURITY OF THE BLT/MEU. Mountain bike scouts were used to conduct nighttime route recon of two canyons which were on our BLT axis of advance. In both cases, the bikes followed rotary-wing close air support armed reconnaissance missions. Armed recon missions confirmed that the defiles were, in fact, clear. The bikes were silent and secure, providing quick real-time intelligence for the MEU. Since the MEU was not yet ashore, the bike scouts established overwatches on the canyons, emplacing hasty obstacles and AT mines after bringing the vehicles forward. This caught the OPFOR by surprise, as they did not expect us to have moved into the canyon, cleared their obstacles, and emplaced our own within a few hours. As a result, the bike scouts with AT-4s were able to ambush an enemy spoiling attack at one of the obstacles. The scouts were able to approach the reverse slope of a hill, hump their bikes to the military crest, then crawl up to observe and report. Upon completion, they simply rode down and returned to their vehicles in record time. While not in use, the bikes were camouflaged and placed in a hide site away from the observation post.

One lesson learned was the overextension of scouts who were placed over six kilometers away in an OP. These scouts were compromised, and at the time they were operating on foot. They were hunted down and killed by OPFOR infantry. This reinforced two things; the scouts out forward must be within supporting range of their LAV-25, and the mountain bike option in this case (the platoon commander chose not to use them in this instance) may have allowed the team to break contact and escape with their lives and information.

The employment of mountain bikes and LAVs during JTFEX (SOCEX1-98) was very successful. The bikes performed well under various conditions in special and conventional roles.

The Bike

The specific components of the 1998 Gary Fisher “Big Sur” were found to be most durable over the last nine months of testing.

- Aluminum frame - reduces salt water corrosion while at sea.
- Avid Brakes - fewer working parts and better than cantilever brakes
- Mono shock or “Rock shock” - needed for rough terrain impacts, now standard on most bikes.
- “Rapid fire shifters” - easier maintenance and user friendly, versus the “grip shift” shifter.
- Kevlar Beaded Tires - extremely durable, tough, and survives well on the exterior of the vehicle.
- Shimano LX components - recommended for survivability, dependability, and sustainability.

A Class IX parts block also accompanies the bikes, in order to sustain them while on deployment. Each bike will be treated as a vehicle and receive scheduled maintenance that will be tracked through a discrepancy folder. Repair and replacement will be tracked and recorded using EROs in order to document the history of each bike using an “in-house” maintenance management program. Two of our older mountain bikes will remain in the rear for additional and continued R&D by 1st LAR Battalion. We have noted that the chromium-magnesium shocks are subject to extensive corrosion and we are replacing them with all-aluminum front shocks for the deployment. Four of our marines have been trained as mechanics and received a six-day training package, courtesy of the vendor, a mountain bike dealer in San Diego.

This R&D period will extend for our entire deployment with the 11th MEU.

In the end, we hope to prove the mountain bike and the LAV, in tandem, provide an “all-wheeled” option which allows commanders to observe-orient-decide-act in an informed, accelerated fashion. The employment of mountain bikes with LAR operations is not the answer to every tactical scenario; it simply addresses an old concept with new technology.

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