A Temporary Solution to an Ongoing Problem:

Now, Make a FIST...

Converting the M3 Bradley for Use as a FIST Vehicle

by Captain Thomas A. Crowson and Staff Sergeant Marty J. Peterson

G/VLLD installed on Bradley

In the Field Artillery Officer Basic Course, as well as in the 13F Advanced Individual Training, new fire supporters are taught that the greatest killer on the modern-day battlefield is the dread Fire Support Team Vehicle (FISTV), with its eight smoke grenade launchers, mighty M-60, and turret-mounted Ground Vehicular Laser Locator Designator (G/VLLD). Perhaps this was once true, but with the fast pace of modern warfare, the FISTV, as a mobile harbinger of death and destruction, is quickly proving itself to be ineffective in meeting current demands.

Nowhere is this more true than in the cavalry. Reconnaissance forces are known for swift, decisive action on the battlefield. The FISTV is simply unable to meet the challenge of rapid maneuver. Regimental armored cavalry FIST lieutenants and NCOs often joke about being effective for the first 10 to 15 minutes of the battle, then being reduced to a radio relay station as they watch the dust trails on the horizon.

Although the 19D scouts are trained as maneuver shooters, there is no substitute for 13F eyes (or the G/VLLD laser) on the target. What is needed is a vehicle that provides improved overall capability for job performance, compatibility with other vehicles and weapons systems in the troop, reliability of both weapons and automotive systems, and survivability on the battlefield.

Field Artillery branch has noted this problem and is developing a solution: the Bradley FISTV (BFISTV). Unfortunately, fielding for this system is several years away. We need a more immediate solution.

Background

In a recent National Training Center rotation, 3d Squadron, 3d Armored Cavalry Regiment was beset by problems with the FISTV fleet. Despite drawing newly rebuilt vehicles, maintenance problems abounded, mimicking those commonly found in the aging fleet at home station.

Those vehicles that did survive the maintenance war quickly found themselves looking at the rear of the tanks as they thundered past into a battle the relatively immobile FISTs were unable to influence. Attempts at observation plans in the offense were laughable. If a FIST did manage to occupy its Observation Post (OP), the rapidly advancing troops were often in the way by the time the OP was set up and ready for missions.

The squadron commander noted this problem and decided that a temporary, immediate fix was necessary. Our goal was to improve the capability, compatibility, reliability, and survivability of the FIST. The solution was to move the troop executive officers to the super command and control environment of the M577 and use their M3 Bradleys as platforms for fire support vehicles. From this base, the FIST teams could easily assemble a vehicle which could maintain pace with the rest of the troop, and be maintained by the maintenance assets within the troop.

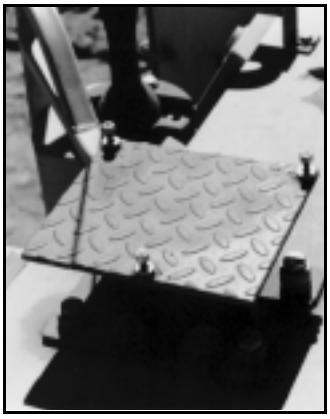
In transferring the FIST teams from the M981 FISTV to the M3 Bradley, two areas had to be addressed to take advantage of the M3 Bradley platform, communications and G/VLLD operations.

Communications

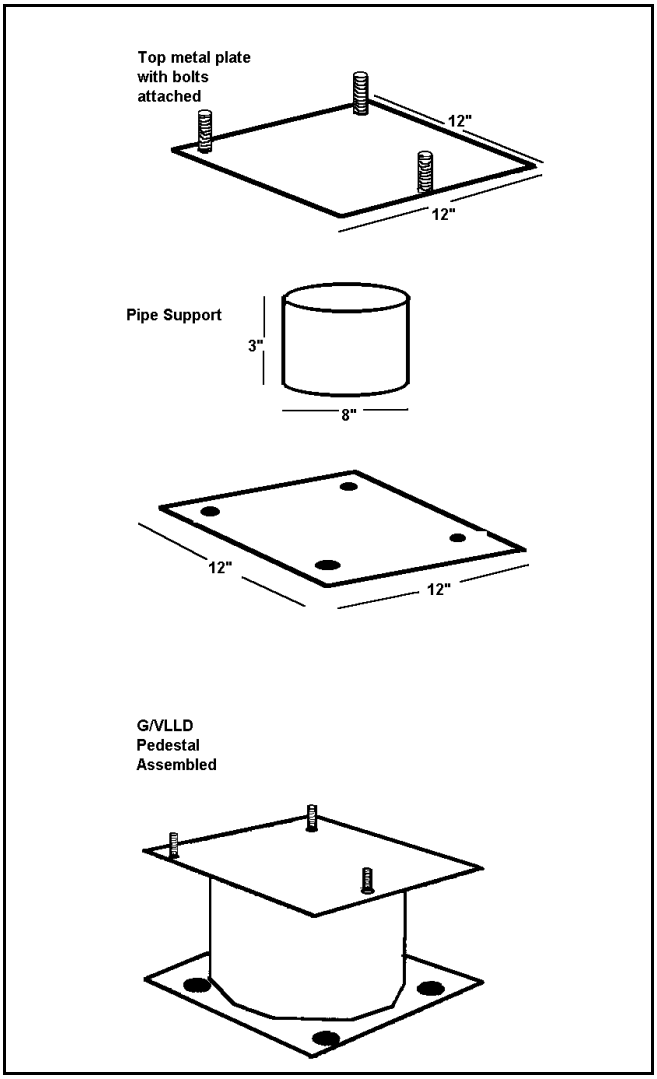
The M3s were originally configured with two radios in the turret. After some consideration, the FSOs and FSNCOs decided to leave those radios in place and mount two more in the crew compartment. This configuration has been tested in the command and control vehicles of the regimental and squadron commanders and S3s. The conversion requires the removal of the 25mm ammunition racks in the left rear of the vehicle, and installation of two SINCGARS radios in their place. The antennae were mounted to the reel mount assembly on the left and right rear of the vehicle, with cables run into the crew compartment through the ramp seal. For power, we removed the ground mount power cable from the FISTV, lengthened it, and installed it in the M3. While not optimal, another option units wishing to follow our lead may pursue is to run power from a wire spliced into the power cable for the interior lights.

Although these radios are not connected to the intercommunications system, the RTO has no problems monitoring both nets, as one is exclusively digital to our supporting Field Artillery units and the other is the squadron FSE net, which is primarily a digital net. The two radios in the turret hold the troop command net and the troop fire support (mortar) net. The FSO and FSNCO can key both of these nets through the CVC, whether riding in the crew compartment or turret of the vehicle. The two crew seats were removed and reinstalled with the backs to the radios, and a Forward Entry Device (FED) stand was fabricated and em-

Construction Details And Project Views



Above, two views of the G/LVDD pedestal mounted on the Bradley turret roof. Radio installation in the crew compartment is seen below. At right, construction details of the pedestal with dimensions. Installed device is seen at upper right.



placed between the seats. This allowed easy access to the radios and the FED for both the FSO and RTO while leaving the entire opposite hull wall open for a situation map.

G/VLLD Operations

We mounted the G/VLLD on a stand fabricated from a three-inch section of pipe with a thick metal plate on each end bolted in place in front of the Bradley Commander's (BC) hatch. On the upper plate, the squadron welder permanently affixed bolts in a pattern to accept the traversing unit (TU) of the G/VLLD tripod (see illustration). The TU was then removed from the tripod and bolted into place on the pedestal with wing nuts, allowing quick installation and removal of the TU and G/VLLD. This pedestal is high enough to permit the free movement of the G/VLLD, yet low enough to prevent forcing the FSNCO to come far out of defilade for its operation. The pipe used in the stand must be at least six to eight inches across and thick enough to withstand the constant abuse commonly associated with movement of a tracked vehicle. For G/VLLD power, we fabricated a cable to run from the A4J2 connector on the SINCGARS mount to the EMI filter of the G/VLLD. We routed the cable through the antenna mount directly behind the radios, around the BC's hatch, and into the G/VLLD. Because power is derived from the same circuit as communications, the FSNCO/BC must ensure all CVCs are unkeyed when firing the laser. This has resulted in a new pre-lasing command of "unkey." After the BC/FSNCO announced "unkey," he listens for each crewmember to announce "unkey" followed by his position. He then announces "lasing," unkeys his CVC, and fires the laser. When finished, the BC/FSNCO keys his CVC and announces "all clear," allowing crewmembers to use CVC communications again. Interface between the G/VLLD and FED or Digital Message Device (DMD) is accomplished through verbal commands from the FSNCO to the RTO over the vehicular intercom.

M3 Operations

In addition to the normal crew of a FISTV, the troop has supplied us with one E5 and one E4 19D cavalry scout. The additional NCO not only acts as gunner for the vehicle, but also contributes a measure of expertise in training the fire support personnel in Bradley operations. In a field scenario, his presence allows the fire support personnel to focus on the FIST mission while he concentrates on the gunnery mission. He rides in the turret with the FSNCO, providing an additional set of eyes and aiding the FSNCO/BC in maneuvering the vehicle. If METT-T allows, the gunner can also ride in the rear of the vehicle, keeping the situation map updated and aiding the RTO. This allows the FSO to ride in the turret, expanding his ability to visualize the battlefield. The E4 acts as the driver of the Bradley, allowing the 13F slotted for the driver position of the FISTV to remain in the howitzer battery with that vehicle. The RTO and FSO ride in the crew compartment of the vehicle, providing command and control, as in the FISTV. To carry the numerous accessories required by a FIST team, we removed the TOW racks from the rear of the vehicle and created a load plan similar to that of the FISTV. Since the interior of the M3 is much larger than that of the FISTV, storage space has not been an issue in the conversion.

Our bottom line goal was to increase ability in compatibility, capability, reliability, and survivability, while addressing issues of communications and G/VLLD operations. The increased compatibility with other weapons and automotive systems in the troop has decreased supply and maintenance difficulties that were the hallmark of the FISTV. In turn, this has increased the reliability of our vehicle, stated both in operational readiness rate and in actual use.

By working out of a Bradley, we are now able to do our job without presenting a conspicuous target to the enemy, as the Bradley looks like any other vehicle on the battlefield. This, coupled with the upgrade in armor from the M113 to the M3, has greatly improved our survivability.

Finally, our overall capability has increased exponentially. No longer are we resigned to watching the rear of vehicles. We are fully able to keep up with any vehicle on the battlefield and no longer have to worry about the time required to erect the targeting head as we can now ride with the G/VLLD in place.

Conclusion

Although most members of the Fire Support Element in 3d Squadron were hesitant to make the switch, the conversion to the Bradley has proven to be surprisingly easy. The crew, with some help from the squadron welder, took only one week to fabricate and install everything in the vehicle. In the field, the M3 has provided us with the ability to maintain contact with the troop, afforded us additional security, and given us a more mechanically reliable mode of transportation. Although we lost the Targeting Station Control and Display (TSCD), most of its functions can be replicated using the FED or DMD interfaced with the G/VLLD. We still have the ability to lase targets, communicate on all nets, both digitally and voice, and compute data. The biggest loss was the directional control provided by the gyros of the FISTV, but we have found that with an M2 compass and a SLGR GPS, there is little degradation of our ability to accurately acquire targets. Despite its few drawbacks, the Bradley is proving to be an excellent interim replacement for the FISTV until the BFISTV is fielded.

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