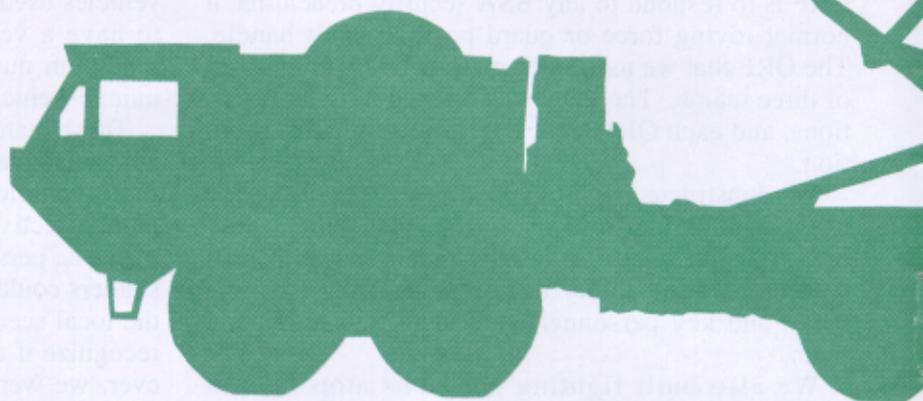


Palletized Loading System:



He marveled at the clarity of the thermal image in front of him. On the screen of the driver vision enhancer, he could see the white-hot silhouette of the waiting heavy, expanded mobility, tactical trucks (HEMTT's) against the dark backdrop of the treeline. The squad of palletized loading system (PLS) trucks he was leading pulled off the road and into a small clearing near the waiting trucks. He pressed a key on the keyboard in front of him. The coordinates on the dimly lit movement tracking system monitor confirmed that his trucks had arrived at the right spot. Almost at once the eight drivers of the PLS trucks pulled their control levers. Fifteen minutes later the squad pulled back onto the road, leaving 6,000 gallons of water, 24,000 gallons of fuel, 30 tons of ammunition, 3 days' supply of food, 2 M2 Bradley fighting vehicle power packs, and 2 generators behind them. The press of another key told the company dispatcher 75 kilometers away that the cargo was delivered, and the squad was on the way home.

This story reads like a logistician's dream: a transportation platform that can deliver large amounts of cargo to off-road locations in foul weather or pitch darkness and provide real-time information to unit operations centers by satellite. The exciting thing is that *this is no dream*. The enhanced palletized loading system (PLS) is making this scenario a reality.

The PLS consists of a truck (M1074 or M1075), a trailer (M1076), and two demountable cargo beds, or "flatracks" (M1077). A self-contained, hydraulic load-handling system in the body of the truck loads and unloads flatracks from both the truck and trailer, eliminating the need for any type of materials-handling equipment at either origin or destination. Each

flatrack can carry 16.5 tons of cargo, for a total capacity of 33 tons per system. Those specifications, combined with a 500-horsepower engine, 10-wheel drive, and central tire inflation system, give the PLS an unmatched combination of capacity and mobility.

Concept and Enhancements

The PLS concept was born from a need to improve the efficiency of the Army's maneuver-oriented ammunition distribution system. Its self-loading capability and hefty payload capacity made the PLS an excellent platform for transporting ammunition anywhere on the battlefield.

The basic PLS flatrack has an 89- by 227-inch steel cargo deck with tiedown points, cargo straps, and International Standards Organization (ISO) twist locks to secure a standard 20-foot container. Logistics planners quickly realized that, with several modifications of the basic flatrack, the role of the PLS could be expanded to include transport of general and containerized cargo. As a result, engineers developed various enhancements to the basic flatrack to allow the PLS to accommodate specific types of cargo (for example, liquid, containerized, or breakbulk).

The simplest enhancement is a set of sideboards that can be mounted on the basic flatrack. Constructed of plywood and steel, the sideboard kit transforms the standard flatrack into a 24-inch-tall box to support all types of breakbulk cargo except ammunition.

The half-height container is another enhancement that increases the potential uses of the PLS. As its name suggests, the half-height container is a 20-foot shipping container that is only 4 feet tall, instead of the usual 8 feet, and has no roof. It comes equipped with a tarpaulin and a set of bows to cover cargo.



by Captain Peter M. Haas

The half-height container is used to transport combat-configured loads of ammunition, especially tube artillery. Because it is ISO compatible, the half-height container conceivably could be loaded in a continental United States depot, shipped overseas, and transported to a corps ammunition supply point by PLS without additional handling.

The M1 enhanced flatrack offers the same cargo space as the basic M1077 with the added benefit of ISO compatibility. Basically a 20-foot container without sides or roof, this flatrack's two end walls can fold down to facilitate loading. It can hold many types of cargo, including small wheeled or tracked vehicles, and can be stowed aboard ship with other flatracks or containers. As with the half-height container, cargo on an M1 enhanced flatrack can be moved directly onto a PLS without additional load-handling equipment.

The Marine Corps' "six cons" system adapts the PLS to transport liquid cargo. Six cons is a modular system of 900-gallon tanks for either fuel or water and a 125-gallon-per-minute pump. One PLS flatrack can carry up to three 900-gallon pods and a pump. The six-cons modules are self-contained and stackable. This makes establishing a retail water or fuel point as easy as unloading a single flatrack from its truck.

The container lift kit (CLK) is useful for uploading individual containers. The CLK is a device attached to the loading arm of the PLS that locks onto one end of a container at the top and bottom corners. The truck then pulls the container on board as if it were a basic flatrack. The CLK allows the PLS to transport a 20-foot container weighing up to 16.5 tons without using a flatrack at all, substantially reducing the need for container-handling equipment on the battlefield. This enhancement promises to be very useful in the

medical community, where it can be used to load deployable medical shelters aboard the PLS for transport anywhere on the battlefield.

Two enhancements that will have a major impact on operational and tactical transportation are the movement tracking system (MTS) and the driver vision enhancer (DVE). While neither system will be unique to the PLS, both will help logisticians exploit other strengths.

The MTS is an adaptation of a system used by several large commercial trucking companies. The system combines the Army's global positioning system with a commercial satellite communications system. MTS enables units to monitor transportation assets using vehicle-mounted hardware and commercial satellites. The system features an onboard terminal in the cab of a truck as well as a terminal positioned in a command and control center, such as a company or battalion operations center. Two-way communication by satellite gives unprecedented control over critical transportation assets. It provides automatic position updates to facilitate asset tracking. En route dispatching, rerouting, and diverting of shipments all become routine actions with this system. The MTS also enables operators to ask questions and report relevant incidents to commanders in real time. Movement controllers linked into the system will also have intransit visibility of cargo. Combined with a platform as versatile as the PLS, MTS could revolutionize transportation on the battlefield.

The DVE is a thermal imaging system capable of operating in degraded visibility conditions such as fog, dust, smoke, and darkness. In conditions of reduced visibility, the DVE allows a vehicle to maintain speeds up to 60 percent of those attained during normal daylight operations. Unlike traditional night-vision devices that magnify ambient light, the DVE

generates a picture based on very minute variances in temperature in the surrounding environment. It gives the operator visibility to the horizon in total darkness and the ability to recognize a 22-inch object at a distance of 360 feet. It can elevate 35 degrees, depress 5 degrees, and rotate 170 degrees in either direction. The DVE promises to be an invaluable tool for combat service support forces, which traditionally lack sufficient night-vision equipment.

Testing a Combat Multiplier

From August to October 1994, the 87th Corps Support Battalion's (CSB's) 396th Transportation Company (Medium Truck) at Fort Stewart, Georgia, replaced its aging M915 tractors and M872 semitrailers with a fleet of 48 PLS's. Since then, the company has been at the forefront of the Army's PLS testing program. As soon as fielding was completed in the fall of 1994, testing of both the basic PLS (truck, trailer, and flatracks) and enhancements began. These enhancements included sideboard kits, half-height containers, M1 enhanced flatracks, MTS's, DVE systems, "six cons," and CLK's.

The 396th Transportation Company's first real-world mission involving PLS was Operation Uphold Democracy, which came almost immediately after fielding. During preparations for operations in Haiti, the 396th Transportation Company employed the PLS in a line-haul role for the first time. The unit deployed 17 PLS's carrying various loads and almost all classes of supply to Homestead Air Force Base in Florida to support an intermediate staging base for the planned invasion.

Later, two PLS vehicles deployed to Cuba to sup-

port refugee camps at Guantanamo Bay. Their primary mission in Cuba was carrying and laying miles of hose line for the tactical water distribution system. This job demonstrated the adaptability of the PLS to a broad spectrum of missions. As visibility of the PLS increases in the field, and customer units begin to employ the system more, such novel uses are sure to become more frequent and productive.

The primary occasion for testing the PLS was the deployment of the 87th CSB to participate in Exercise Mojave Strike. The exercise was held at the National Training Center at Fort Irwin, California, from 26 April to 30 May 1995. During this rotation, the 396th Transportation Company used the PLS and its enhancements to support the 1st Brigade, 24th Infantry Division (Mechanized).

Under the watchful eye of the Army Test and Evaluation Office at Fort Lee, Virginia, the PLS trucks performed a total of 86 missions in which they moved over 670 tons of cargo. Sixty-seven of the missions involved using at least one enhancement. Transport of class IV, V, and IX supplies (construction materials, ammunition, and repair parts) accounted for 51 of the 86 missions. The PLS was also key in helping evacuate unserviceable equipment from unit maintenance collection points. Missions moving class I, II, and III(P) supplies (subsistence items, clothing and individual equipment, and packaged petroleum, oils, and lubricants) rounded out the remainder of the PLS taskings.

Results

Overall, the PLS proved itself a highly capable and reliable transportation platform. In their evaluation of



□ The PLS consists of a truck, a trailer, and two demountable cargo beds, or "flatracks."



□ A self-contained, hydraulic load-handling system in the body of the truck loads and unloads the flat-racks from both the truck and trailer.

the 24th Infantry Division's rotation, observer-controllers at the NTC commented that never before had such a robust countermobility plan as the 1st Brigade's actually been implemented. The observers were most impressed with the ability of the PLS to deliver numerous loads of combat-configured class IV directly to the planned obstacle sites.

In addition, the performance of several of the PLS enhancements was especially noteworthy. The sideboard kit increased the utility of the basic M1077 flat-rack and was used in a variety of missions. The one drawback of this enhancement is that two soldiers are required to install the sideboards.

The half-height container proved a versatile tool in a variety of missions, from moving general cargo to hauling trash. It was also useful in transporting hazardous materials. While not designed for or tested in this role, its enclosed cargo space does offer some spill protection for leaking hazardous materials containers.

Testing of the MTS at the NTC served to whet the appetites of transporters throughout the 396th Transportation Company and the 87th CSB staff. Its ability to provide two-way communication between the operators and their command centers, regardless of distance or terrain obstacles, promises to be a windfall for logisticians across the entire spectrum of combat service support operations. This system could double or triple the utility of motor transport assets, because trucks could be dispatched from one mission to another without having to return to their units.

The DVE added yet another dimension to the PLS's versatility. During testing at the NTC, one PLS truck became known among the company's

ranks as the "Midnight Express" because it operated almost exclusively at night using the DVE. During the course of the exercise, "Midnight Express" logged 1,145 miles in total darkness.

Although the MTS has been returned to the contractor for testing elsewhere, the 396th Transportation Company soldiers at Fort Stewart have continued to train with the basic PLS, six prototype DVE's, and other enhancements. In September 1995, the company loaded 26 PLS trucks aboard ship for deployment to Egypt, where they tested the mettle of this promising new transporter in Exercise Bright Star '95.

The palletized loading system represents the greatest innovation in military land transportation in decades. Its unequaled mobility, payload capacity, and versatility, together with its enhancements, make it a combat multiplier on the combat service support battlefield. The utility of the PLS is limited only by the dimensions of its cargo and the imagination of the combat logistician who employs it. It has been fielded across the Army and is ready to assume its role as the combat transporter for Force XXI. It is definitely not just another truck. **ALOG**

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