

A P P E N D I X A

P A L L E T I Z E D

L O A D S Y S T E M

Appendix A has been extracted from TRADOC Pamphlet 525-65. It provides the interim operational concept for Class V support utilizing the PLS.

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U.S. ARMY OPERATIONS CONCEPT FOR CLASS V SUPPORT USING THE PALLETIZED LOAD SYSTEM (PLS) SHORT TITLE: MANEUVER ORIENTED AMMUNITION DISTRIBUTION SYSTEM (MOADS-PLS)

Summary. This pamphlet addresses the ammunition distribution system at corps and below. Use of the PLS allows the transfer of loads to and from the vehicle without the need for materials handling equipment (MHE), thus saving resources and time. Combining MOADS with PLS allows ammunition to be delivered forward of the corps storage area (CSA) more quickly.

Applicability. This pamphlet applies to Headquarters TRADOC staff elements, major subordinate commands, TRADOC installations, and TRADOC centers and school.

Suggested improvements. The proponent of this pam-

phlet is the Deputy Chief of Staff for Combat Developments (DCSCD). Send comments and suggested improvements on DA Form 2028 through channels to Commander, HQ TRADOC, ATTN: ATCD-P, Fort Monroe, Virginia 23851-5000.

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**Chapter 1
Introduction**

1-1. Purpose. This pamphlet provides the Army with a Class V support concept that is responsive to the combat user's needs. This pamphlet describes the concept of using the Palletized Load System (PLS) to support the Airland Battlefield (ALB). The concept provides a logical transition to the logistical support concepts currently envisioned for the Army of the future. The Maneuver-Oriented Ammunition Distribution System (MOADS) using PLS, will provide faster response times, combat-configured loads (CCLs) for high consumption ammunition, and 100 percent of the user's total ammunition requirement through the ammunition transfer points (ATPs).

1-2. References.

Related publications are listed below.

- a. AR 710-1 (Centralized Inventory Management of the Army Supply System)
- b. FM 9-6 (Munitions Support in the Theater of Operations)
- c. FM 9-38 (Conventional Ammunition Unit Operations)
- d. FM 55-10 (Movement Control in a Theater of Operations)
- e. FM 63-3 (Combat Service Support Operations Corps)
- f. FM 100-10 (Combat Service Support)
- g. FM 100-16 (Support Operations: Echelons Above)

*This pamphlet supersedes TRADOC Pamphlet 71-6, 17 September 1990.

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Corps)

h. TRADOC Reg 11-16 (Development and Management of Operational Concepts)

i. TRADOC Pam 525-49 (Ammunition Support on the AirLand Battlefield)

1-3. Explanation of abbreviations and terms.

The glossary contains abbreviations and explanations of special terms used in this concept.

1-4. Overview.

a. MOADS is the foundation for future ammunition support to the ALB; however, the needs of deployed combat forces require rapid movement of ammunition to ensure successful tactical operations on the ALB. The current structure requires a repeated lift capability at CSAs and ammunition supply points (ASPs) and cannot respond quickly to fluctuations on the battlefield. Forward ammunition stocks are not easily relocated or repositioned within the commander's decision window for application of deep attack principles or nonlinear tactical maneuvers.

b. Large quantities of grounded ammunition stocks present lucrative targets for all levels of threat forces. Threat forces will make a concerted effort to locate, target, and destroy ammunition operations storage sites to degrade U.S. combat capabilities and effectiveness. Threat forces include the following:

- (1) Conventional, unconventional and special purpose forces.
- (2) Air mobile, ground, and airborne units.
- (3) Tactical and bomber aircraft.
- (4) Long-range artillery, rockets, and missiles (air and ground launched).
- (5) Nuclear, biological, and chemical (NBC) weapons.
- (6) Directed energy weapons.

c. Threat forces vary in size from one-man saboteurs to an operational maneuver group. The ammunition distribution system must be designed so that a nuclear or nonnuclear attack on one or several storage sites does not produce catastrophic losses to the theater or corps.

d. The PLS enhances the MOADS. The PLS facilitates the relocation of ammunition stocks by combining the use of loaded sideless containers (SCs) and PLS transportation prime movers in ammunition supply point (CSAs, ASPs, and ATPs). Stocks are no longer grounded but are stored on SCs. These SCs, in simplified terms, slide directly on or off the PLS vehicle. The vehicle can drop off or pick up an SC loaded with ammunition in a matter of minutes. The ammunition transfer and movement capability increases, and the need for organic MHE decreases.

e. The PLS is a highly flexible system that is employable worldwide and complements operational requirements of the ALB. PLS eliminates the need to transload ammunition for those user units owning PLS vehicles, freeing MHE and personnel from transload operations.

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Those units having PLS capabilities will normally pick up loaded SCs of ammunition at designated ammunition supply points. Currently, the only units designated to receive the PLS vehicle are corps transportation units, direct support (DS) and general support (GS) ammunition companies, and self-propelled (8-inch, 155-mm) artillery units. Units not equipped with PLS will continue to be supported at designated supply/transfer points using onboard MHE or ammunition supply/transfer point MHE to transload ammunition onto organic vehicles. If and when Multiple Launch Rocket System (MLRS) units are equipped with PLS vehicles, they will be supplied in the same manner as other artillery units with PLS vehicles. In the future, SCs may allow throughput of ammunition directly from Continental United States (CONUS) to the using unit, reducing the need for intermediate handling.

1-5. Limitations.

a. PLS must be fielded in corps sets. A corps set consists of corps transportation units, DS and GS ammunition companies, self-propelled artillery units, and additional SCs for storage of ammunition at the theater storage area (TSA), CSA, and ASP.

b. The ammunition distribution system uses air transportation. SCs will be transportable by C-141, C-5, C-130, and C-17 aircraft and can be carried externally by CH-47D helicopters.

Chapter 2 Concept

2-1. Continuous refill system distribution.

Ammunition support in a theater of operations is based on a continuous refill system distribution to the ATPs and ASPs in the division area. Stocks issued to users are replenished by stocks moved up from storage areas in the rear. Ammunition is delivered on SCs from CSAs and ASPs by PLS prime movers to the ATPs. The ATPs receive 75 percent of their ammunition from the CSA and 25 percent from the ASPs.

2-2. Shipment and storage.

A theater's ammunition is shipped from CONUS to seaports, airheads, or logistics over-the-shore operations sites. Once in theater, the ammunition (containerized or breakbulk) is shipped on theater transportation assets to the TSA or the CSA.

a. Theater Storage Area. The TSA stores up to 30 days of supply of the theater's Class V reserves. One or more GS ammunition companies operate the TSA. The TSA receives 100 percent of its ammunition from the port of debarkation (POD). The TSA generally ships ammunition on theater line haul trailers or rail flatcars to the CSA. The TSA may use inland waterways if available. Theater transportation will not include PLS prime movers unless they are available from host nation support units. TSAs also provide support on an area basis to communication zone users who pick up required/allocated ammunition at their supporting TSA.

b. Corps storage area. The CSA maintains 7 to 10 days of supply for the supported corps. One or more GS

ammunition companies, depending on the corps authorized stockage level operate the CSA. The CSA receives up to 50 percent of its ammunition from the POD. The rest, 50 percent or more, comes from the TSA transported on line haul trailers or rail flatcars. Ammunition received by the CSA can be in either CCL or single Department of Defense Identification Code (DODIC) configuration. All ammunition shipped from the CSA to ATPs will be combat-configured loads on PLS SCs transported by corps transportation units using PLS prime movers. Ammunition shipped from the CSA to ASPs may be in breakbulk or single DODIC configuration.

(1) Based on divisional forecasted needs and updated changes, the CSA, using PLS corps transportation, ships ammunition to the ATP in CCL configuration.

(2) The CSAs provide support to units operating in the corps rear on an area basis with local units picking up required/allocated ammunition at the CSA.

c. Ammunition supply prints. ASPs maintain a 1- to 3- day supply of ammunition to meet surge and emergency requirements for divisional and nondivisional units. ASP stockage levels are dependent on tactical plans, availability of ammunition, and vulnerability of lines of communication (LOC) to interdictions (air or ground). Their primary role is to allow continuous resupply to ATPs even if the CSA-ATP LOC is interrupted.

(1) The DS ammunition company is capable of operating up to three ASPs and provides personnel and equipment for operation of an ATP. One hundred percent of the tonnage arriving at the ASPs is shipped from the CSA in either break bulk or single DODIC configuration on PLS vehicles.

(2) The ASP can provide up to 25 percent of the division requirement in the form of CCL, break bulk, and single DODIC shipments on PLS SCs. ASPs primarily support the ATPs but will provide support on an area basis when required.

d. Ammunition transfer point. Corps PLS vehicles supply the three forward ATPs organic to the forward support battalion of the division and the ATP operated by the DS ammunition company. These ATPs provide support, on an area basis, to divisional units and corps units (in support of division) based upon established corps/division priorities. Forward ATP supplies, equipment, and personnel move with the brigade trains.

(1) The ATP receives 75 percent of its ammunition from the CSA and 25 percent from the ASP. The ammunition shipped to ATPs is carried on corps PLS vehicles. Seventy-five percent of the ammunition from the CSA and 25 percent from the ASP is shipped to ATPs on corps PLS vehicles. Ammunition is transferred from corps PLS vehicles to the user's tactical vehicles, using either resupply vehicles with onboard MHE, such as Heavy Expanded Mobility Tactical Truck (HEMTT) or PLS, or the ATP's organic MHE. The division ammunition office (DAO) coordinates ATP operations/resupply with corps and divisional units. All division and corps users will pick up their ammunition at the DAO- designated ASP or ATP. The ATPs are replenished as required.

(2) An ATP staffed with personnel and equipment form the DS ammunition company of the corps support group. This ATP augments the three brigade ATPs so that divisional and corps units can receive 100 percent of their ammunition through ATPs. This ATP provides support on an area basis to divisional and corps units as directed by the DAO.

(3) Under emergency/surge conditions and, when METT -T factors permit, ammunition may be delivered to the battalion trains area of those units equipped with PLS vehicles.

(4) Multiple Launch Rocket System ammunition for divisional and corps units will be delivered to designated ATPs. Using units will transload rocket pods from corps PLS vehicles onto user vehicles, using their onboard MHE.

(5) Corps transportation assets will recover empty SCs at the ATP and return them to the ammunition distribution system. Empty PLS SCs are designed to allow stacking one upon another, allowing movement of more than one SC per lift. Using units equipped with PLS vehicles are responsible for managing and recovering SCs used for internal distribution. At the ATP, exchange of empty SCs from the using unit should be on a one-for-one basis with loaded SCs. If corps transportation units are directed to deliver loaded SCs to the using unit field trains area, the using unit should provide empty SCs to the using battalion trains area for recovery by corps transportation trucks. If such provisions are not possible, the using unit will consolidate empty SCs and deliver them to the supporting ATP as soon as possible for subsequent reintegration into the distribution system. Accountability and control of war reserve SCs are covered by AR 710-1, Chapter 6.

(a) During transition to war, SCs will be loaded at storage sites and released for movement to upload forward locations. Once ammunition starts flowing to using combat units, loaded SCs will be exchanged for unloaded ones on a one-for-one basis. Retrograded SCs will be delivered to designated ammunition activities for their subsequent MOADS use.

(b) The Department of the Army Movement Management System (DAMMS) will provide transportation management information that allows in transit visibility. The theater/corps/division movement control organization will control the flow in accordance with procedures in FM 55-10.

(6) Ammunition support for rear operations is by supply point distribution. Units draw from the nearest ammunition supply activity—ASP, CSA, or TSA.

(7) FM 9-6, chapter 2, describes the communications requirements and capabilities of ammunition units from ATP to Theater Army Area Command (TAACOM) Materiel Management Center (MMC). The use of PLS within the MOADS system does not create additional ammunition communications requirements or impact on the existing communications capabilities of ammunition units.

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(8) The introduction of PLS within the MOADS does not generate additional information management requirements within the Standard Army Ammunition System (SAAS) beyond that outlined in FM 9-6.

2-3. **Effects of palletized load system on current ammunition distribution system.** The PLS, in simplified terms, allows an SC of ammunition to slide on or off the PLS prime mover and trailer, which provides more flexibility in ammunition distribution by reducing the need for MHE. Because the transfer is quicker, users spend less time in the area, thus reducing the signature of the ammunition supply points and ammunition transfer points. (See figure 2-1). The introduction of the PLS in the current concept causes some changes in ammunition distribution throughout the theater.

a. The port of debarkation receives 100 percent of its ammunition stocks from the wholesale Class V system, either from CONUS depots or Outside the Continental United States (OCONUS) pre-positioned war reserve sites. This ammunition will arrive at the port in either break bulk or containerized shipments. Ammunition will

be shipped forward to the TSAs and CSAs via theater transportation assets.

b. The TSAs receive 100 percent of their ammunition from PODs. Containerized ammunition arriving from the POD will be removed from the container and loaded onto SCs in a single DODIC configuration for storage at the TSA or forward movement to the CSA via theater transportation assets.

c. The CSA receives 50 percent of its Class V stock requirement from the POD, either break bulk or containerized. The remaining 50 percent of the CSA requirement will arrive on SCs from the TSA. The CSA builds CCLs of ammunition on SCs and ships them to ATPs on corps transportation PLS vehicles. Additionally, CSAs ship single DODIC break bulk stocks on SCs to ASPs on corps transportation PLS vehicles.

d. The CSA ships 100 percent of the ASP requirements on break bulk or single, DODIC-loaded SCs and 75 percent of the ATP requirements on CCL-loaded SCs transported by PLS vehicles. The ASP ships the remain-

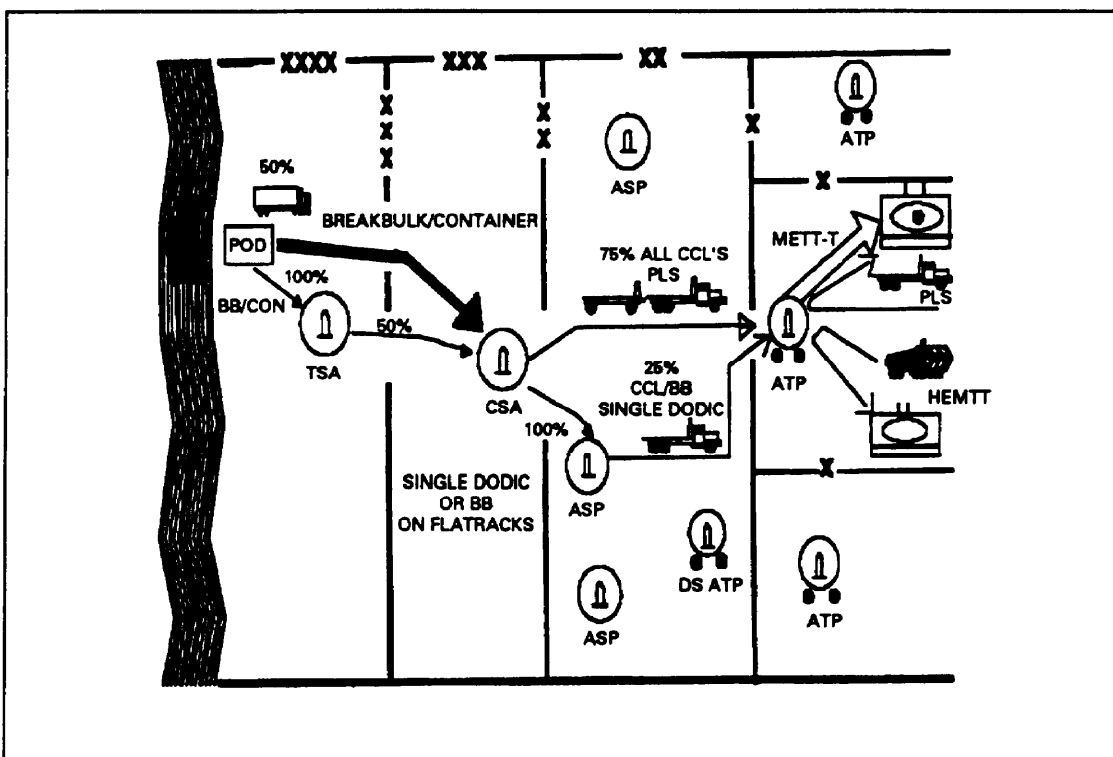


Figure 2-1.
MANEUVER ORIENTED AMMUNITION DISTRIBUTION SYSTEM
USING PALLETIZED LOAD SYSTEM (PLS)

ing 25 percent of the ATP requirements in the form of CCLs and single DODIC shipments.

e. The addition of PLS to MOADS will eliminate the need to transload ammunition at ATPs for those user units owning PLS vehicles, thus reducing the requirement for personnel and MHE involved in transloading operations.

f. While the ultimate goal of using PLS is to reduce transload functions at the ATP, units not possessing PLS vehicles will still require some transload support. Unit vehicles with on-board MHE will be used to self-transload ammunition whenever possible. Ammunition units and ATPs will retain adequate personnel and MHE to provide transload support to non-PLS units.

g. When an SC is delivered to the battalion trains area, ATP, or ASP, corps transportation picks up an empty SC for recycling within the distribution system.

h. The ammunition distribution system uses air transportation. PLS SCs will be air transportable.

i. The PLS offers the potential to connect the whole sale and retail ammunition distribution system by loading SCs at the manufacturer and shipping them to any destination within the system. Interface between the wholesale/retail systems would reduce redundant handling and decrease shipping time.

j. Impact assessments for doctrine, training, leader development, organization, and materiel are provided in appendixes A, B, C, D, and E respectively.

Appendix A Doctrine

Where appropriate, MOADS, including PLS doctrine, will fit the standard Army supply system. Specific comments and guidelines regarding MOADS are found in several manuals. When PLS is fielded, the following publications may require revision.

- a. AR 385-64
(Ammunition and Explosives Safety Standards)
- b. FM 9-6
(Munitions Support in the Theater of Operations)
- c. FM 9-13
(Ammunition Handbook)
- d. FM 9-38
(Conventional Ammunition Unit Operations)
- e. FM 63-3
(Combat Service Support Operations - Corps)
- f. FM 100-10
(Combat Service Support)
- g. FM 100-16
(Support Operations)
- h. ST 9-38-1
(Division Ammunition Operations)
- i. TM 9-1300-206
(Ammunition Explosive Standards)

Appendix B Training

a. Existing training programs impacted at the U.S. Army Ordnance Missile and Munitions Center and School include the following:

(1) Some instruction in the Maneuver Oriented Ammunition Distribution System utilizing Palletized Load System include in the program of instruction (POI) for Ordnance Officer advances and Basic courses.

(2) Some instruction for MOADS/PLS in the 55B, 55X, Advanced and Basic Warrant Officer, Basic Noncommissioned Officer Course (BNCOC) and Advanced Noncommissioned Officer course (ANCOC) courses.

b. Implementation of MOADS/PLS initial operational capability (IOC) should not generate any new instructor contact hours for courses in para B-1.

c. MOADS/PLS training will be included in corps storage area, ammunition supply point, and ammunition transfer point exercises conducted during 55B, BNCOC, and ANCOC courses.

d. The system training plan (STRAP) for the PLS developed by the U.S. Army Transportation School on 1 November 1990. The plan identifies training impacts for transportation, field artillery, ordnance munitions, and ordnance maintenance proponents, including active and reserve components. Paragraph 8 of the STRAP, "Significant Training Issues at Risk," identifies no problem areas with system or proponent training.

Appendix C Leader Development

There are no specific leader development impacts identified at this time.

Appendix D Organizations

a. Successful tactical operations on the AirLand Battlefield (ALB) will require rapid movement of ammunition. The current structure requires a repeated lift capability at corps storage areas and ammunition storage points. It cannot respond quickly to fluctuations on the battlefield, while the Maneuver Oriented Ammunition Distribution System serves as the foundation for future ammunition support to the ALB, it does not allow forward ammunition stocks to be easily relocated or repositioned.

b. The Palletized Load System (PLS) will enhance MOADS. The PLS will be incorporated into unit operations as a means of providing an efficient method of storage and distribution of ammunition as follows:

(1) The general support (GS) ammunition company from the theater storage area (TSA) to the CSA and from the CSA to the combat user.

(2) The direct support (DS) ammunition company— from the ASPs through ammunition transfer points to the combat user or, in some instances, directly to combat

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users.

c. The mission and support requirements of such organizations indicate they should be 50 percent mobile with organic equipment/vehicles.

(1) The DS ammunition company (at ASP, ATP) must be able to establish and operate three ATPs and one ATP engaged in the receipt, storage, combat configuration, and issue of conventional ammunition to the combat user using the PLS.

(2) The GS ammunition company (at TSA, CSA) must be able to establish and operate an ammunition supply facility engaged in the receipt, storage, rewarehousing, and container unstuffing of conventional ammunition. Additionally, the GS ammunition company at the CSA builds combat-configured loads and issues conventional ammunition using the PLS.

Appendix E Material

Material requirements. Incorporation of the Palletized Load System (PLS) into ammunition units provides for increased efficiency in ammunition distribution by reducing the transload requirement and need for MHE.

Glossary Section I

Abbreviations

ADA	air defense artillery
ALB	AirLand Battle/Battlefield
ASP	ammunition supply point
ATP	ammunition transfer point
BB	break bulk
BSA	brigade support area
BTOE	base table of organization and equipment
CCL	combat-configured load
CON	containerized
CONUS	Continental United States
CSA	corps storage area
CSR	controlled supply rate
DAMMS	Department of the Army Movement Management System
DAO	division ammunition office
DIVARTY	division artillery
DODIC	Department of Defense Identification Code
DS	direct support
FAASV	field artillery ammunition support vehicles
GS	general support
HEMTT	heavy expanded mobility tactical truck
HNS	host nation support
LOC	lines of communication
LOTS	logistics over the shore
MECH	mechanized
MHE	materials handling equipment
MLRS	Multiple Launch Rocket System
MOADS	Maneuver Oriented Ammunition Distribution System

MMC	Material Management Center
MOPP	mission oriented protective posture
NBC	nuclear, biological, and chemical
OCONUS	Outside Continental United States
OTOE	objective table of organization and equipment
PLS	Palletized Load System
POD	port of debarkation
SC	sideless container
S&P	stake and platform trailer
TAACOM	Theater Army Area Command
TSA	theater storage area

Section II Terms

Ammunition transfer point

The point where corps transportation Palletized Load System vehicles, loaded with ammunition, rendezvous with user representatives and ground their ammunition loaded SC, pick up empty SC and return to designated distribution points.

Combat configured loads

A preplanned package of ammunition transported as a single unit. CCLs are designed to support a type unit or weapon system and to maximize the transportation assets available either a PLS SC or a stake & platform (S&P) trailer. The design of CCLs should take into consideration both U.S. and host nation transportation assets. (See also FM 9-6, 1 Sep 89).

DODIC

Department of Defense Identification Code used to identify a type round of ammunition (i.e., A080 for 5.56-mm blank).

Port of debarkation

The point of initial off-load of ammunition received in theater from CONUS.

Push/pull system

Ammunition is delivered regularly on a push type basis. Forecasted changes to the type and quantity of ammunition delivered are submitted by the unit when the standard delivery requires deviation.

Self-loading

A vehicle with the capability to load itself using on-board materials handling equipment.

Throughout

Term used to describe shipments that bypass intermediate activities in the supply system, thereby avoiding multiple handling.