

# ARMY LOGISTICIAN

SEPTEMBER-OCTOBER 1983



Lifeline Logistics



# ARMY LOGISTICIAN

VOLUME 15, NUMBER 5  
SEPTEMBER-OCTOBER 1983

THE OFFICIAL MAGAZINE OF UNITED STATES ARMY LOGISTICS

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*Army Logistician* magazine (ISSN 0004-2528) is an official Army periodical published bimonthly by the Editor at the U.S. Army Logistics Management Center, Fort Lee, VA 23801, under the sponsorship of the Assistant Secretary of the Army (Installations, Logistics, and Financial Management), the Deputy Chief of Staff for Logistics, and the Commander, U.S. Army Materiel Development and Readiness Command. Second class official mail postage paid at Petersburg, VA, and additional mailing offices. Postmaster: Send address changes to Editor, *Army Logistician* Magazine, ALMC, Fort Lee, VA 23801.

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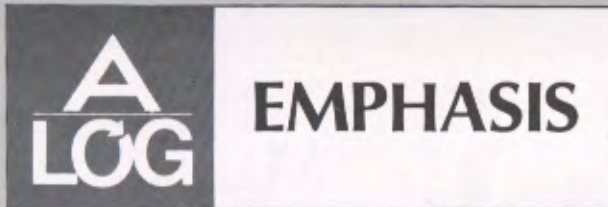
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**COVER**—An Army LCU transfers vehicles into the docking well of the *Shreveport*, a Navy LPD, during Exercise Lifeline '83. For a pictorial survey of Lifeline '83 activities, see page 24.

*Army Logistician* publishes timely, authoritative information on Army and Defense logistics for the Active Army, Army National Guard, Army Reserve, civilian employees of the Army, and the public. Our purpose is to increase knowledge and understanding of logistics and to encourage and stimulate innovative thought in areas of logistics by providing a forum for those ideas. The views expressed in the articles are those of the authors and not necessarily those of the Department of Defense or the Department of the Army. □ Photographs are U.S. Army unless otherwise noted. Material may be reprinted if credit is given to *Army Logistician* and the author, except where copyright is indicated. □ Use of "he" and any of its forms is intended to include both masculine and feminine genders. Exceptions will be indicated. □ Articles, photographs, and items of interest on any facet of Army logistics are invited. Direct communication is authorized to: Editor, *Army Logistician*, ALMC, Fort Lee, VA 23801. □ Use of funds for printing this publication was approved by HQDA on 1 October 1982 in accordance with AR 310-1. □ Active Army units receive distribution under the pinpoint system outlined in AR-310-2. DA Form 12-5 must be sent to Cdr, AG Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220. ARNG and USAR units must submit requirements through State adjutants general or USAR channels. □ Subscriptions and rates are available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.



**LOG CONCEPTS DESCRIBED**

The Army Training and Doctrine Command (TRADOC) is developing and publishing operational concepts that describe how future combat, combat support, and combat service support operations will be conducted. They identify future trends and disseminate information on emerging doctrine pending incorporation into doctrinal and training literature. These concepts are being published in the 525-series of TRADOC pamphlets. See related story on page 33 and listing on page 44.

**STATE OF SUPPLY REPORTED**

The Deputy Chief of Staff for Logistics, Lieutenant General Richard H. Thompson, has prepared a report on major supply concepts and initiatives undertaken to support the Army's materiel goal. Titled "Supply: State of the Union," it covers the efforts underway to improve materiel distribution, stockage selection and materiel availability, war reserve management, automated systems enhancement, troop support, ammunition management, and supply operations and management. The report parallels last year's report, "Maintenance: State of the Union."

**LIFELINE '83 BIG AS LIFE**

This Spring, more than 13,000 soldiers representing 156 Active Army and Reserve component units participated in the Lifeline '83 field training exercise. The exercise, conducted annually, was the largest of its kind to date and the first to emphasize combat service support procedures in contingency operations. The simulated corps area covered a 700- by 150-mile portion of the east coast and included 6 ports, 5 depots, and 13 Army installations. An ALOG on-the-scene report of Lifeline '83 activities begins on page 24.

**IT IS NOW LAR**

"Logistics assistance representative," or LAR, is the generic title now being used to identify Army Materiel Development and Readiness Command (DARCOM) technicians and specialists with the logistics assistance program. The new title applies to missile maintenance technicians, field maintenance technicians, field supply technicians, electronic equipment representatives, and logistics management specialists sent from DARCOM subordinate commands to help units in the field with maintenance problems.

**GAO ADDS DOD AUDIT DIVISION**

The General Accounting Office (GAO) has established a separate division to audit Department of Defense (DOD) activities and make recommendations for improving their efficiency and effectiveness. The national security and international affairs division will audit and investigate military logistics, equipment, procurement, research, planning, and security assistance. Permanent auditing teams will cover each armed service. The GAO's oversight of military affairs was previously divided among several divisions.

*(Continued on page 46)*

# Fast-Break Concept

by Robert A. Krause

"For success in a conventional European war, the Army must consider logistics as a weapon system," the author says, and outlines his concept for increasing transport capability.

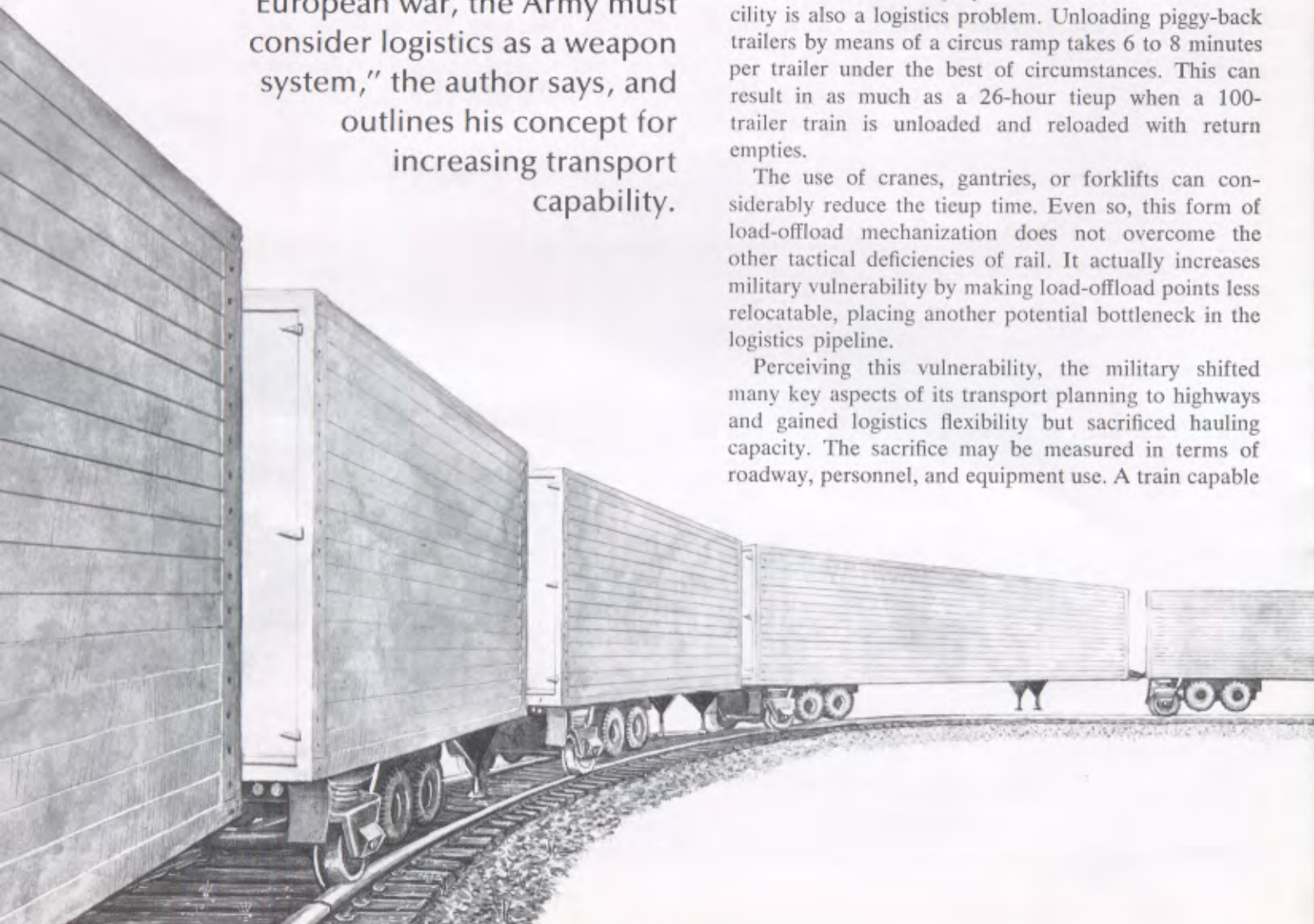
Modern armaments have increased the need for military land transport capacity almost tenfold since World War II. In the next war, this and other strategic changes will force the need for a redesigned military logistics system. In past European wars, theater rail capacity was usually sufficient to meet transportation needs of the day as well as foreseeable military needs. After all, each rail line had the hauling capacity of an eight-lane highway. Assuming rail lines to the front were operational, one had only to make sure sufficient rolling stock was in place to fulfill the need.

In recent years the Army has given wartime rail transport a lesser priority. The lessened priority results from budgetary constraints and the general tactical weaknesses of rail systems. Rail bridges, tunnels, classification yards, and switching facilities are fixed, making them highly attractive enemy targets. If these facilities are destroyed, the rail system grinds to a halt. There is no system that allows for the rapid leapfrogging of breaks in rail lines.

Forward tactical deployment from a rail terminal facility is also a logistics problem. Unloading piggy-back trailers by means of a circus ramp takes 6 to 8 minutes per trailer under the best of circumstances. This can result in as much as a 26-hour tieup when a 100-trailer train is unloaded and reloaded with return empties.

The use of cranes, gantries, or forklifts can considerably reduce the tieup time. Even so, this form of load-offload mechanization does not overcome the other tactical deficiencies of rail. It actually increases military vulnerability by making load-offload points less relocatable, placing another potential bottleneck in the logistics pipeline.

Perceiving this vulnerability, the military shifted many key aspects of its transport planning to highways and gained logistics flexibility but sacrificed hauling capacity. The sacrifice may be measured in terms of roadway, personnel, and equipment use. A train capable



of carrying 200 trailers or containers will extend slightly over 1 1/2 miles of rail. A truck convoy, moving 55 miles per hour at properly spaced intervals, would extend over 22 miles of highway. Support requirements for the modern division and the need to keep highways clear for tactical use make each of those 22 miles military precious. Perhaps too precious.

Personnel and equipment also show dramatic increases for the same haul by highway as compared to rail. For example, the number of operations personnel goes from 4 for rail to 400 for highway. The number of power units requiring fuel and maintenance support goes from 2 for rail to 200 for highway.

The Army must regain its hauling capacity. By applying new technologies and operational concepts, the Army should be able to satisfy the need for both tactical flexibility and massive hauling capacity.

The creation of a system with both flexibility and capacity would have tremendous tactical payoff value. A standard European war scenario visualizes a massive Soviet frontal assault during which the North Atlantic Treaty Organization (NATO) allies will fight a rear-guard action, waiting for reinforcements of personnel and equipment from the United States. Theoretically, NATO would stop the momentum, reverse the tide of battle, and drive the assault forces back to prewar borders.

This scenario is based upon the ability to rapidly turn the tide of battle. If the tide does not turn because men, supplies, and equipment cannot rapidly be brought to bear in massive quantities against the Soviet assault, the temptation to use the nuclear "trump card" increases dramatically.

Reversing the tide of battle cannot be done without a logistics system that has both flexibility *and* capacity. Providing transport for an army that is regaining lost ground requires the agility to leap from piece-to-piece of the broken transportation infrastructure. Today, NATO has neither the agility nor capacity.

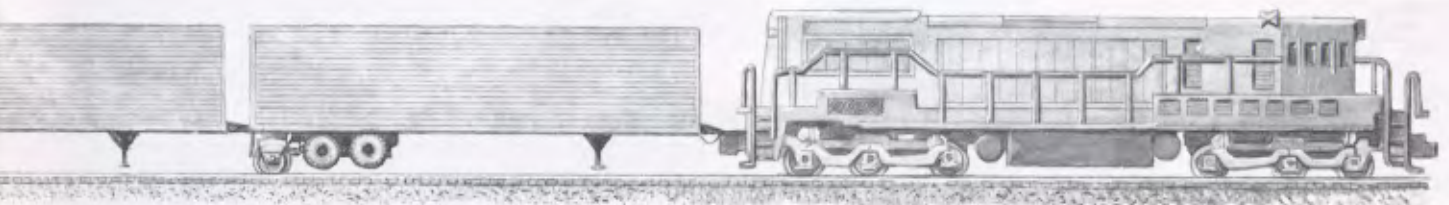
There is a clear need to establish a concept for a freight transportation system, merging commercial viability with the Army's need for capacity and flexibility in wartime—a *fast-break system*. The fast-break concept that I propose merges flexibility and capacity by applying technology to operational concepts.

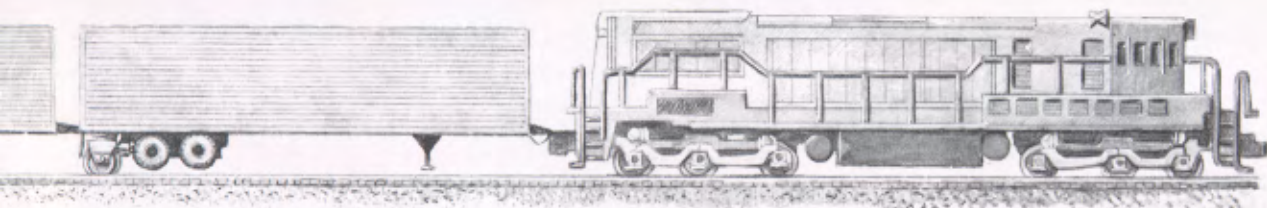
Current Army rail doctrine for Europe relies on host nation support for personnel and equipment. Doctrine assumes that host nation civilians will run trains from ports to the corps area, where military personnel will take over.

Critically, this doctrine assumes civilians' willingness to work under wartime conditions. This assumption proved accurate in World War II, but the changed times and weapons of today make it highly questionable. Modern Soviet assault doctrine assumes an in-depth penetration of NATO forces. An assault on the rear support area will simultaneously occur with the main frontal attack. Key rail facilities will be primary targets. Voluntary civilian cooperation is unlikely in the midst of bombs, bullets, and chemicals. These considerations should force the rethinking and restructuring of European theater rail doctrine.

The Army's rail procurement policy for Europe is also flawed. The policy has been to *not* purchase innovative freight transportation equipment systems until their commercial feasibility has been proven. Reliance on private enterprise to provide designs for wartime logistics systems may have some cost advantages, but it also has significant conceptual flaws. The commercial feasibility of freight transportation systems is not judged on operability in an environment where major portions of the transportation infrastructure are likely to be blown away.

Commercial usefulness and compatibility are important considerations in a military freight transportation system. Those considerations help keep cost to the Government down and assure a large supply of commercial equipment for wartime mobilization, but using





commercial considerations as the *only* criteria filters out the Army's need for battlefield survivability in a high-volume hauler.

Standards for a military rail system should require that the system—

- Easily and completely integrate into the existing host nation rail system. This provides for peacetime use as well as the use of full fast-break and conventional

rail equipment during permissible phases of a war.

- Easily integrate with the existing trailer-on-flatcar and container-on-flatcar systems and provide for coupling with existing highway tractors.

- Have the capability to rapidly bypass rail classification yards, switching facilities, bridges, and tunnels using minimum intermodal transfer equipment and highway tractors and need only equipment sufficient to



□ The RoadRailer container chassis (above) and flexible length intermodal platform (FLIP) car (right) could provide design bases for the fast-break concept.





get around barriers to movement.

- Be able to rapidly load and offload at any point on the rail line with minimum preparation, using direct highway-rail interface, without major intervening transfer equipment.

- Be able to load and offload simultaneously or selectively from any point in the train. This would allow for rapid dispersal of equipment and also allow critical freight to receive priority when selective offloading is required.

- Not be dimensionally limited. The system should be able to handle with the same ease an Army 20-foot container, a 40-foot container, or a tank.

Given the anticipated scenario of any future European war, the advantages of an operational fast-break system become obvious.

Consider, for example, this hypothetical situation. A unique train, loaded with containerized war materials for the front, pulls out of Rotterdam. The train carries both standard Army 20-foot containers, commercial 40-foot containers, and replacement tanks loaded on special high-strength frames. These are aboard fast-break railcars. The train also includes conventional railcars in order to take maximum advantage of available equipment.

After leaving the port, the train comes upon the switchyard where it is to be broken to serve the two-sector front only to find the switchyard bombed out. All freight loaded on fast-break rail equipment is rapidly transferred to the appropriate rail lines, where locomotives and fast-break core equipment are waiting. The fast-break equipment operates on a direct highway-rail interface. Twenty-foot containers on conventional rail equipment must await the arrival of a forklift detachment. Forty-foot containers on conventional rail equipment have to undergo breakbulk and transshipment, as no readily adaptable forklifts are around to handle their dimensions. Tanks on conventional railcars have to be offloaded and reloaded using hastily constructed circus ramps. The tanks have to be operated by replacement tank drivers bound for the front.

After the separation of freight for sectors A and B of the front is complete, the train for sector B, now exclusively composed of fast-break equipment, continues toward the front.

Near dawn, at a pre-selected point on the track, the train stops. Under the cover of darkness, highway tractors converge on both sides of the train. The motor

vehicle operators perform simultaneous modal transfer operations. Each tractor pulls a fast-break highway trailer, carrying an empty container from the front, alongside the train. The tractor disconnects, pulls a loaded fast-break container from the train, parks it, then maneuvers the empty container into the waiting fast-break train for return to port.

The work proceeds rapidly so that the full train will not be stationary and vulnerable to air attack for long. Within 30 minutes, the train is unloaded of materiel, reloaded with empty containers, and begins its return to the port. The important cargo of war supplies continues onward to the front by highway.

Later, the next evening, another train consisting of fast-break equipment approaches the front. It passes the staging area used the previous evening and moves to a point nearer the NATO army. The army, having received its supplies in a timely manner, is ready to advance.

Several systems that are available for development could make the fast-break concept a reality. One such system that I have been perfecting, I call "Bestrack." Other rail-based intermodal proposals, notably Bi-Modal Corporation's RoadRailer and Berwick Forge and Fabricating's FLIP (flexible length intermodal platform), with modification and further development, might provide the equipment design base to make all or most of the fast-break concept operational.

For success in a European war, the Army must consider logistics as a weapon system.

Today it does not. Policy barriers that prevent this must be reconsidered and removed. To provide the Army with the logistics ability to absorb and repulse a Soviet frontal assault and strengthen the conventional option, the fast-break concept—or one like it—is needed in the NATO arsenal. **ALOG**

*Robert A. Krause is an instructor in transportation and logistics at the School of Business, Iowa State University, Ames, Iowa. He is a captain in the Iowa Army National Guard and commands the 1133rd Transportation Company in Mason City, Iowa. As a former Iowa State legislator, he chaired the Iowa House Transportation Committee and has also served as regional representative of the Secretary of Transportation. Krause acted as the Secretary's principal field representative during the Rock Island and Milwaukee Railroad bankruptcies.*



# Feeding the Long Gray

by Specialist Four Steve Negus

**L**unch at the United States Military Academy is no brown-bag affair.

Each weekday during the school year, the academy's 4,300 cadets begin filing into the cavernous Cadet Mess Hall at 1220. Once all the cadets have assembled, a cadet officer calls them first to attention, and then to "Take seats!" All at once, the entire Corps of Cadets sits down for lunch.

Within 5 minutes, the 10 cadets at each of the 430 tables have been served lunch. Today, it's hamburgers and cheeseburgers—one of a wide variety of lunch menus that also includes tacos and beef stew, pork-rib sandwiches and crabmeat creole. Within 30 minutes, the meal is over, and by 1300 the cadets are gone.

During that 30-minute lunch, the cadets have eaten

9,000 hamburgers and rolls and 4,500 slices of cheese. They fixed up all those hamburgers with 28 gallons of pickle chips, 200 heads of lettuce, and 450 tomatoes. Cottage-fried potatoes filled out the menu—1,350 pounds of them. For dessert, they ate 430 pounds of cookies and 2,000 pieces of fruit. To wash the meal down, they drank 450 gallons of fruit drink and dipped into some of the 400 gallons of milk that are delivered to the mess hall every day.

"The numbers we deal with here are astounding," said Captain Nancy E. Burton, the officer-in-charge of the mess hall and its only military employee. "But we deal with that kind of volume every day. That's a normal meal."

The process that brings so much quality food to the



□ "Luncheon is served" at precisely 1220 each weekday. The bustle of 4,300 cadets assembling enlivens the quiet dignity of the mess hall's wood-paneled walls, slate floors, historic flags, and formal portraits.



table, day after day, goes through four steps—planning, procuring, preparing, and serving.

Each meal the cadets eat gets its start in the busy office of Nicholas A. Camporeale, the chief of the food preparation section. About 3 months before a meal will be served, Camporeale drafts a possible menu for the meal, and then takes the draft to the Academy's Menu Board for approval.

The Menu Board, the "brains" of the Cadet Mess Hall, consists of all the procurement, preparation, and service chiefs responsible for bringing meals from a scratch pad on Camporeale's desk to a cadet's plate in the mess hall. The Menu Board charts out about 3 weeks of menus in each session. The biggest challenge to its members is to strike a balance between food items that will be nutritious and those that will be popular.

"We try to give the cadets three balanced meals with about 4,000 calories every day, and our dietitian helps us make sure the cadets are eating right," Burton said.

"But it's also important that the cadets like the food we serve them, and the best way to find out what they like is to ask them. We conduct surveys and ask the cadets to participate in the Menu Board meetings. We even ask them to bring in recipes from home to see if we can adapt them."

According to Chief Chef Manuel P. Mendes, the mess hall currently uses about 250 active recipes, and Burton's emphasis on variety has added 20 of these in

the last 6 months. A new spinach and ricotta cheese roll, for example, finally convinced the cadets to eat their spinach.

Once the menu is fixed and the section chiefs have decided how much food they will need to prepare the meals, it is then up to the procurement agent, Nina R. Daniel, to order the food and make sure it arrives on time.

Since the Cadet Mess Hall is not affiliated with the Army's food service program, Daniel can purchase food directly from suppliers rather than requisitioning it through the Army's Troop Support Agency. This flexibility gives her the freedom to take advantage of special values and to purchase a wide variety of foods.



□ Cooks grill the hamburgers that will be consumed at today's lunch (left). Food-laden trays are placed in "hot-carts" to keep the meals warm until serving time (above).

The mess hall regularly buys its meat, for example, from more than 100 different suppliers.

The source of Cadet Mess Hall funds is also unusual for an Army mess hall. Rather than using the meal card system, the Cadet Mess Hall receives a flat rate of \$3.80 per day for each cadet. About \$1.30 of the daily rate is spent on lunches, so the mess hall can spend about \$6,700 for each lunch.

Food orders are delivered to the mess hall anywhere from 1 month to 1 day before they will be used, depending on the contract agreement and the type of food. Nonperishable goods, such as pickle chips or condiments, are stored in a warehouse which has approximately 5,400 square feet of storage area. The warehouse usually stocks about \$250,000 worth of food—a 20-day supply.

In addition to the nonperishable storage, there are also 8,000 square feet of freezer and chill space. The mess hall can store enough meat in the meat freezer to feed the cadets for 4 days, and it's not unusual to find 2,000 pounds of potatoes in the vegetable cooler.

The preparation of any one meal begins about 24 hours before the meal will be served and involves each of the food preparation section's three units—the meat cutting shop, the bakery, and the kitchen.

On the day before a hamburger and cheeseburger lunch is served, the butchers in the meat cutting shop finish grinding the 1,650 pounds of ground beef that will be used. All beef comes into the meat cutting shop in the form of hindquarters. The 12 butchers there, directed by foreman Nicholas Carfizzi, cut steaks, roasts, and ribs from the hindquarters and use the high



□ Butchers Petrolese and Perez prepare meats for future meals (above). Chef Mendes taste-tests the beef broth constantly brewing in the kitchen (right, top). Part of the 450 gallons of fruit drink that the cadets will consume at today's lunch is mixed in one of the mess hall's huge beverage kettles (right, bottom). Cadets hungrily devour today's hamburger lunch and leave the mess hall at precisely 1250—4,300 appetites satisfied in just 30 minutes.

quality trimmings for ground beef. The meat cutting shop also prepares other meats used in the mess hall, including poultry and fish.

In the bakery, a hamburger lunch means baking 9,000 hamburger rolls from scratch. The bakers start by mixing up the bread dough at 0130 on the day the rolls will be served. By 0930, all the rolls have been baked and are ready to go.

The 18 bakers, led by head baker Hans Schabel, work staggered 8-hour shifts to keep the bakery open 24 hours a day, 6 days a week. Except for the cookies and loaf bread, they produce all the mess hall's baked goods, from pizza pies and cobblers to doughnuts and chocolate eclairs.

The bulk of the mess hall's food preparation takes place in the kitchen, where 96 cooks bring the meals together. On the day of a hamburger lunch, 38 cooks are assigned to prepare the meal and they have it started well before breakfast has even been served.



While one team chops the lettuce and slices tomatoes, another seasons the hamburger and forms it into quarter-pound slices. It takes 5 cooks 2 hours to grill the 9,000 hamburgers.

The consistent quality of the food that comes out of the kitchen, whether it is hamburgers or flounder stuffed with crabmeat, depends on the talent of the cooks. Mendes and 8 other Cadet Mess Hall cooks have attended the Culinary Institute of America. But kitchen operations also depend on massive and expensive equipment, and according to Burton, this has been the mess hall's Achilles' heel. The deep-fat fryer, which holds 1,400 pounds of fat and originally cost \$47,000, exemplifies the problem. While the fryer can still fry all the cottage-fried potatoes needed for a hamburger lunch in 1 1/2 hours, it is getting old and temperamental.

"We're about 10 to 15 years behind the state-of-the-art in food preparation equipment, so my biggest concern since I arrived 2 years ago has been to keep the equipment going," Burton said. "The cooks here do a tremendous job with the equipment they have."

As the cooks finish preparing the food and start loading it onto serving trays, 10 portions to a tray, the meal enters its last phase. By this time, the red-jacketed waiters have cleaned up the dining area from breakfast, and the 2 dishwashing pantries are quiet after washing all the breakfast dishes. The waiters have put a fresh table cloth on each of the 430 tables. Each place has been set with flatware, including a plate decorated with the USMA crest.

The waiters load the trays from the kitchen into hot-carts to keep the food warm, and 10 minutes before the meal begins, each waiter has rolled a hotcart into position in one of the dining area's six wings. Each waiter will serve 10 tables and 100 cadets.

Through a civilian contractor, the Cadet Mess Hall employs more than 180 people as waiters and dishwashers, and it takes 45 waiters to serve 1 meal.

At 1220 the cadets pour in. In half an hour the meal is over. The cadets leave the mess hall to continue their busy day, and the waiters begin clearing the tables. It would be nice at this point to relax after a job well done, but in just a few hours, the cadets will be back for dinner. And there is so much still to do. **ALOG**

*Specialist Four Steve Negus is an Army journalist assigned to the United States Military Academy, West Point, New York. A native of Virginia, Specialist Negus was graduated in 1981 from the University of Virginia with a major in English.*

# Property Accountability—

by Captain Craig N. Robinson

If you are a company grade officer without command experience, you probably look forward to the day when you will take command. You'd like to make your unit the best-trained outfit in the U.S. Army. One thing you must keep in mind: a well-trained unit without the proper equipment is doomed to failure. When an M60 gunner opens his spare barrel case and discovers that it is empty, he may feel that his chain of command has failed him. If you are now or soon will be a unit commander, it will be your responsibility to provide your unit with the tools they need to accomplish their mission.

Too many commanders are getting into trouble because of poor property accountability. We all have roughly the same education and similar military experience. We also should have in common a desire to do a good job. Then why do so few commanders leave their command position without paying money for lost property? Probably because as an incoming commander they didn't conduct a *thorough* inventory.

## The Change-of-Command Inventory

If you have just taken command of a unit, the first thing you must do is to find out what you are *supposed* to have. This can be a very time-consuming task, especially if you must sign for a large amount of equipment.

First, you need to consult the property book to determine what you are signing for.

Next, you need to determine which individual equipment items have separate components. To determine this, refer to the current supply catalog listing. Make a list of the lines you will look for. If you have unique equipment—such as that of a headquarters and A company—you may have difficulty getting the appropriate listings.

Even common equipment—such as filing cabinets—can be difficult to inventory. You probably will sign for several of these. If your unit is like most, there are several different kinds of filing cabinets, but these six or seven different cabinets (each with a different stock number) are listed under a single line number. The

price ranges from \$50 to \$750 each. And what about that odd-looking chair in your office? Is it really the one whose stock number is listed in the property book, or will you identify it merely through a process of elimination?

When you are ready to actually conduct this inventory, you will find it helpful to construct a spread sheet—a simple but invaluable tool. You should make a separate sheet for each of the unit's property books, organizational as well as installation. You should fill out the quantities in pencil because they will often change; equipment is routinely transferred, received, lost, or just moved to another hand receipt.

The spread sheet can be the key to good property accountability. By examining it, you can determine if all of your equipment is signed out. You also can quickly determine where your equipment is when you are asked to provide equipment to another unit. Finally, you can use the spread sheet to determine which platoon can best use a certain piece of equipment.

When you properly prepare for an inventory, you will find conducting it is fairly simple. You must schedule enough time and be thorough, looking everywhere! Inventory from the old hand receipt, noting those pieces of equipment that were not signed for. Ask, "Why?"

You will get all sorts of answers. Some will merely reply, "We have never signed for that." Your response should be direct—"Sign for it now."

Others will ask, "Why do you need to know?" or "Why do I have to sign for it?" The latter question is indicative of a fear of losing money and is caused by a lack of knowledge and experience. It is your job to provide this knowledge, teaching your subordinates how to maintain their property. You must also supervise and check the equipment assigned to them.

Still others will make up an excuse, like, "It belongs to Bravo Company." In response to that answer, you should insist that they produce a hand receipt from Bravo Company before you take the item off your property books.

Look everywhere. Leave no locks unopened. If you can't locate the key for a particular lock, use the



ORG *Headquarters and A Company*

		TOTAL	1	2	3	4	5	6	7	8	9	10
A03210	ACCESS GAS FLD RANGE 341	1										
A32316	ALARM CML AGT M10	4										
A32568	ALARM CML AGT M16	1										
A53697	AMP RD FRQ AN-1881/U	1										
A58033	ANAL SPTCM TS-7268D	1										
A95703	ATHLETIC REC KIT	1										
A96837	ATTENATR CN-492/G	1										
A99385	ATTENATR VAR CN-764/U	1										
B15688	BAG WTR STERIL OG 36 GL	4										
B29464	BARBER KIT	1										
B45597	BATTERY CHARGER PP-7286/U	1										
B49272	BAYONET M7 W/SCABBARD	163										
...	BLANKET W/...											

□ **A spread sheet will help you in the inventory process.**

lost or stolen. In this category are tool boxes and basic issue list items. Monthly inventories should be conducted by the sub-hand-receipt holder and given to the supply room. You should spot check these inventories to make sure they are complete.

Another way you can maintain good property accountability is to update your sub-hand-receipts. You will normally do this whenever there is a change of sub-hand-receipt holders, but you may direct the update at any time. Again, you should keep your spread sheet handy, making sure the quantities still match. Resolve problems immediately.

Attempting to maintain good property accountability in spite of the seemingly constant changes among classes of supplies presents another challenge to you as commander. Components that are expendable items this month may become durable ones next month, or vice versa. Often, there appears to be no reason for a particular change in expendability code. For example, a hex screw costs \$.05 and is classified "durable," while an oscilloscope for a special electronic equipment repair van (SEER 1968) costs \$1,880 but is classified "expendable."

Supply class changes often are unannounced, and you probably will not have time to check the Army master data file each month to see if an item has changed classes. Supply catalogs are also revised periodically. If you're lucky, you'll be able to get a copy of the revised edition, turn in items that were deleted, and order new ones to replace them. However, you will be more realistic to expect that you won't get the new version promptly or that, if you do, your inexperienced

supply personnel won't know what to do with it. There will be equipment excesses because tools weren't turned in that should have been. Later a survey may be submitted against you for errors that were beyond your control.

The moment all equipment is surveyed, shortages should be noted in shortage annexes and replacement tools should be ordered. Be advised that these two tasks may present difficulties due to the volume of required notations and the shortage of supply personnel. Remember, during a survey the supply room must continue to carry on its daily supply task of surveying other lost or damaged tools, replacing equipment lost through normal wear and tear, and receiving and issuing newly issued tools. Neither you nor your supply sergeant can ignore everything else to concentrate on the survey.

**Reporting Losses**

As soon as you discover a shortage, initiate property accountability action. Of course, you should give the sub-hand-receipt holder time to attempt to find the "lost" property. As a rule, if the property isn't located within 3 to 5 days of diligent search, you can consider it lost.

You need to accept the fact that a certain amount of equipment is going to be lost; that's to be expected as the normal cost of doing business. You could perhaps eliminate losses by instituting extremely tight controls, but those controls probably would be more expensive than the property you would save.

Your worries would be fewer if you could expect to have well-trained and highly motivated supply sergeants and supply clerks. Unfortunately, the tables of organization and equipment do not authorize personnel in numbers adequate to handle the multimillion-dollar volume of equipment that goes through the supply room. Since there aren't enough authorized supply personnel, you'll have to cross-train personnel from other military occupational specialties. To complicate matters further, you can expect your supply sergeant to change at least once during your 18 months of command. Consequently, ultimate responsibility for property will fall on you. Routine surveys will help prevent your losses from becoming too great.

Somewhat different than actual losses are property discrepancies—what we may call cases of mistaken identities. At least one time during your command inventories you will probably discover an item that isn't listed on the property book. Maybe that strange chair in your office turns out to have a stock number that isn't listed in your records and thus belongs somewhere else. To avoid paying for the chair that isn't there (but probably in another company commander's office), you can file an administrative adjustment report and get credit for the chair. Administrative adjustment reports can be used even if the two items—in this case, the two chairs—differ greatly in cost.

## Excess

You may wonder how there could be excesses in a tight supply system, where it is more likely that property will be taken than given. Generally, there are four reasons for excess: lack of records, changes in supply class, deletion from a supply catalog, and discovery of "lost" property.

Sometimes equipment that enters the supply system is not recorded. For example, some property comes in through the class IX system. This source accounts for but a small portion of the total excess.

Other equipment experiences a change in supply code, changing from "expendable" to "accountable." Microfiche, for example, one time was considered expendable and most units received large quantities. Now that it is an "accountable" item, microfiche received before the change appears as excess.

Other times, a particular tool is deleted from the supply catalog. Although normal procedure is for the tool then to be turned in, often it is left in the supply room. Thus, it appears as an excess.

But the most common source of excess is the discovery of items that had been reported missing (and perhaps paid for) during a previous survey. After being reported missing, the items were deleted. Consequently,

once rediscovered, the found equipment would be labeled "excess."

There are several ways you can handle excess equipment. No matter how carefully you have inventoried, occasionally an item that appears to be excess really isn't. I recommend that at first you have the sub-hand-receipt holder sign for and retain the excess equipment until you determine with certainty that it *is* excess. In the course of investigation, you may discover that the equipment belongs to someone in (or even outside) your company.

Take, for example, an inventory of tents. Suppose during an inventory a commander determines that he has two more general purpose medium tents than he is supposed to. Later, while training in the field, he learns from his food service sergeant that those two tents actually belong to another company. Had he listed those two tents as excesses, he would then be *short* two tents.

As commander you periodically should review your excesses. This will help you decide which items are true excesses and which are not. You should be advised, however, that in spite of the good reasons I have given for slightly delaying the reporting of excesses, you *will* be held liable for them during an annual general inspection. So *do* turn them in as soon as you are certain they are excesses.

Most commanders do not account for excess equipment. No one is signed for it, no one maintains it, and therefore no one is responsible for it if it is lost or damaged. Although onhand quantities always match the authorized amount, there's one problem. If you ever do need the excess equipment that is in your system, you'll have to perform a survey. That takes time, and you may need the equipment immediately. I have found that by sub-hand-receipting all excess and recording the actual onhand quantities on the spread sheet, I can better maintain control.

As commander, your role in managing property accountability will be an important but difficult one. There are no easy solutions, no magic answers. Having read these words of advice—another commander's view of property accountability—at least you may better understand the complexity of the problem. Now it's up to you to establish a property accountability program that works.

**ALOG**

*Captain Craig N. Robinson is assigned to Sharpe Army Depot, Lathrop, California. When he wrote this article he was commander of Headquarters and A Company, 124th Maintenance Battalion, 2d Armored Division, Fort Hood, Texas. A quartermaster officer, Robinson is a graduate of the Infantry Officer Advanced Course and the Supply Management Officers' Course.*

# Ammunition — Can the

by Werner Grosshans

**W**ith national defense being elevated to the Nation's number one priority and with the sizeable increases in the Defense budget, the Department of Defense (DOD) must make every effort to assure the Congress and the public that these funds are spent effectively and efficiently and that they will enhance military readiness. The way these funds are applied is an equally important question. Should DOD buy more materiel and store it to assure sustainability or would it be more cost effective and efficient to improve the industrial base, thereby providing quicker surge and mobilization capabilities?

The trade-offs are important and can drive significant dollar investment in either stocks or improved industrial capability. Who makes these trade-offs and is Congress adequately informed? The Congress is getting more insistent that DOD link justification for funding to readiness and show the expected readiness improvements relative to funding levels. This linking should enable decisionmakers in DOD and the Congress to better consider alternatives and trade-offs.

The terms "military preparedness, readiness, or capability" are somewhat imprecise and connote different things to different people because they are often used in varying contexts with varying interpretations. This impreciseness creates a number of problems for DOD, the Congress, and the public.

As I see it, readiness consists of a number of critical interrelated elements and adequate military capability can be achieved only if all these diverse, yet interdependent, elements function satisfactorily. All elements are important since serious degradation in one will so weaken the system that it will no longer be able to accomplish its mission. "The weakest link in the chain" theory applies. Two of the vital elements include sustainability and an adequate industrial base.

Mobilization and surge planning are vital elements in synchronizing the use of funds and assuring that they are prudently applied. The Defense Department's industrial preparedness planning program was developed to carry out the responsibility of ensuring that industry can meet wartime needs for defense systems, equipment, and components. The DOD has continually given this program a low priority and provided limited funds. Programs designed to enhance initial

combat capability have been emphasized. While initial combat capability is important, failure to plan adequately with industry may mean that the United States can fight only a short war because it has not adequately bridged the gap between initial combat capability and war materiel needs for prolonged engagements. In fact, huge gaps exist between when stocks will be exhausted and when production will equal demands.

During the 1950's and 1960's, DOD followed a concept called "D to P" to bridge this gap. (See article on page 16.) Under the D to P concept, the services stocked enough items to support combat consumption until industry could supply requirements. This concept was abandoned when DOD issued its "D plus 6" months mobilization planning guidance. Under this guidance, the services were to stock enough items to meet the first 6 months of combat consumption, after which industry was to supply the needed items. I believe the D to P concept was the better approach, and I am supportive of DOD's 1984 planning guidance which calls for a return to it. The General Accounting Office over the years has recommended that DOD make greater use of D to P planning. This planning is particularly beneficial in ammunition and munitions production.

The chart on page 17 clearly shows serious gaps in the current guidance. Even if one were to assume that under the current D+6-month guidance all the war reserve stocks of ammunition had been bought and are in usable condition, which is not the case, there would still be a major shortfall of several months before industry could produce enough to meet wartime demand.

Reviews of the industrial base element indicate that while industry can produce a lot of ammunition, it cannot meet total mobilization requirements, especially for the newer, more sophisticated items. These shortfalls permeate the entire ammunition production base and involve shortages in metal parts; propellants and explosives; and load, assemble, and pack capability. Moreover, some existing load, assemble, and pack capacity cannot be used fully because of imbalances in production capacities for metal parts, propellants, and explosives.

I believe one typical example of this shortfall can

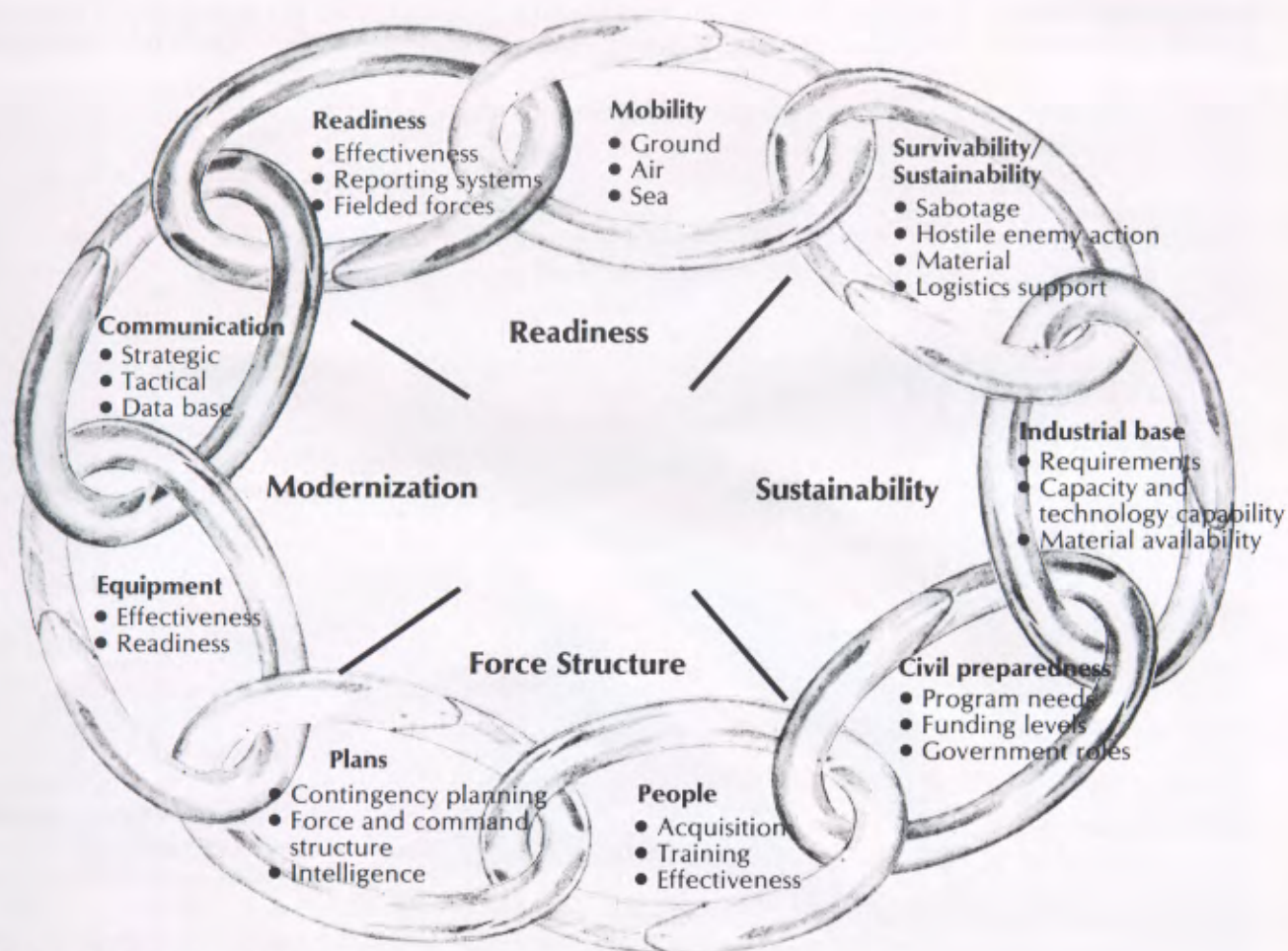
# Industrial Base Respond?

be seen in production of newer ammunition items by looking at the current situation with the 155-millimeter M483A1 artillery shell. It is one of several improved conventional munitions that expels grenades. These grenades are expelled and dispersed in flight over the target area, providing wider, more effective coverage of certain targets than the older conventional projectiles which were fired for blast effect and fragmentation.

As of 30 September 1982, the Army had only 1,613,600 of these rounds on hand and 858,000 more were funded through fiscal year 1983 but not yet delivered. After these are delivered, there will be a

shortfall of roughly \$4.5 billion worth.

The current U.S. production capacity consists of various plants which, even if they operated around the clock, can produce only about 120,000 rounds a month. The new Mississippi Army Ammunition Plant, which is scheduled to be operational in 1984, was designed to double production capacity, but even this falls far short of the Army's estimated need for 643,000 rounds a month. However, the current capacity is limited to the availability of composition A5 explosive. The M483 output is currently limited to 44,000 rounds a month. The Army is now designing a new facility to



□ Weakest-link-in-the-chain theory.

overcome this shortage. However, it may take as long as 8 years to design and build this facility at an estimated cost of \$800 million.

Examples of other shortages are—

- The base capacity for the 105-millimeter M456 high explosive antitank round is 95,826 rounds a month; but, because of single base propellant shortfalls, production is limited to 71,000 rounds.

- The base capacity for the 155-millimeter M549 rocket-assisted projectile is 158,762 rounds a month, but shortages in motor body assembled metal parts constrain its production to 50,000 rounds.

- The Army has ample capacity to produce trinitrotoluene (TNT) but only half the capacity to produce oleum, a basic material needed to produce TNT.

There are also numerous deficiencies in existing facilities. For example, the Army has identified \$166 million worth of equipment voids at Government and contractor plants. The Army estimates \$1.25 billion is needed to correct all identified deficiencies. About three-fourths of these are categorized as pre-mobilization day deficiencies which would prevent the base from meeting assigned production schedules if they were not corrected before mobilization. Many of these

deficiencies will take more than a year to fix. Finally, it takes too long to surge the output from active facilities and to start up inactive facilities.

The ammunition production base modernization program has not closed the gap between needs and capacity. This program began in 1970 with the objective of upgrading U.S. munitions production to meet both peacetime and mobilization requirements in the most efficient, economic, and expeditious way, using the latest, proven state of the art in manufacturing. The modernized facilities were expected to require less start-up time; reduce unit production costs; and eliminate numerous environmental, health, and safety hazards associated with older facilities.

In 1977 the Army estimated that to meet 1982 mobilization production requirements, over \$9.3 billion would be required, and it would take until 1997 before all the required projects could be funded. Currently, this point is moot since DOD investment guidance restricts sizes of facilities to that needed to produce quantities in the 5-year defense program. While this guidance should preclude overbuilding facilities, it also results in building facilities that are much smaller than needed during mobilization. The Army estimates that

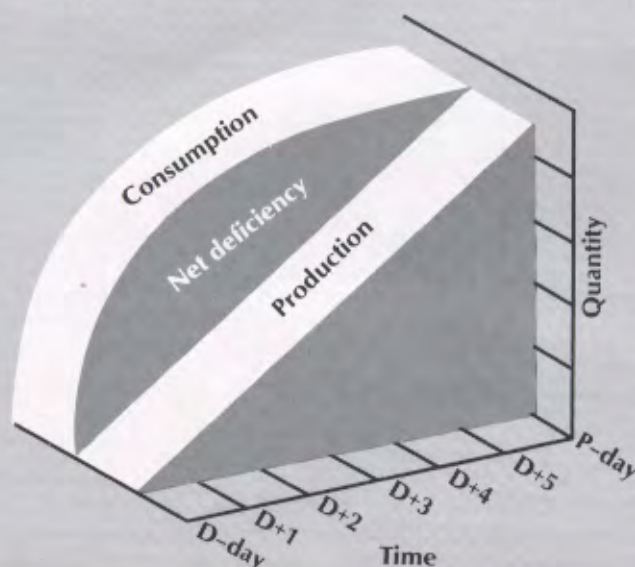
## D to P Concept

The D to P concept, in its simplest terms, can be defined as a logistics planning concept under which supplies on hand at the beginning of a war must last until wartime production equals wartime consumption. "D" day is, of course, the day the war begins, and "P" day

is the day that the production base is producing as many items of war per day as are being consumed. This concept was used during the Vietnam War.

While the concept, by definition, may seem simple, logistics planners must anticipate and factor in the intervening elements between the producer and the consumer. Procurement leadtime, depot consolidation time, in transit shipping time, and oversea distribution time must all be considered in the planning.

Use of the D to P planning concept can be graphically illustrated by plotting anticipated consumption and production curves as shown in the chart at the left. Logisticians must be concerned with the shaded area—the net deficiency—between consumption and production. Peacetime stocks, or an industrial base that can quickly respond, must be



the current guidance limits capacity for new items to about 25 percent of that needed for mobilization.

The Army has invested some \$2.4 billion in the modernization program since 1970, of which about \$500 million was for commercial sector facilities. Over \$150 million was invested in modernized small-caliber ammunition production facilities; the bulk of this was invested in 5.56- and 7.62-millimeter facilities at the Lake City Army Ammunition Plant. These facilities have not added to the capacity. Instead, they replaced older production lines with current technology. These facilities should lower unit production costs, increase safety, and improve surge capability.

Changes in mobilization requirements and investment policies have caused considerable changes in the program over the years. For example, since 1973 the monthly mobilization requirements for the 5.56-millimeter M193 ranged from a high of 306 million rounds in 1973 to a low of 59 million rounds in 1980. How does one make credible facility investment decisions with such fluctuating requirements?

The services have requested large sums in recent appropriations for procuring conventional ammunition to meet peacetime training needs and building war

reserve stocks. For example, the services' fiscal year 1983 ammunition request exceeded \$4 billion. It is generally believed that in the coming years larger amounts will be requested as the services continue to build their ammunition inventories. At the same time, DOD has announced plans to enhance the U.S. industrial base capability and the responsiveness for critical items. I believe DOD needs to devote high-level attention to industrial base capability and sustainability. The timing is vital—it must be now. Before large stocks of ammunitions are bought, the trade-offs need to be carefully considered to assure that the funds are spent prudently resulting in the needed improved military capability. In the determination process, the following issues need careful attention—

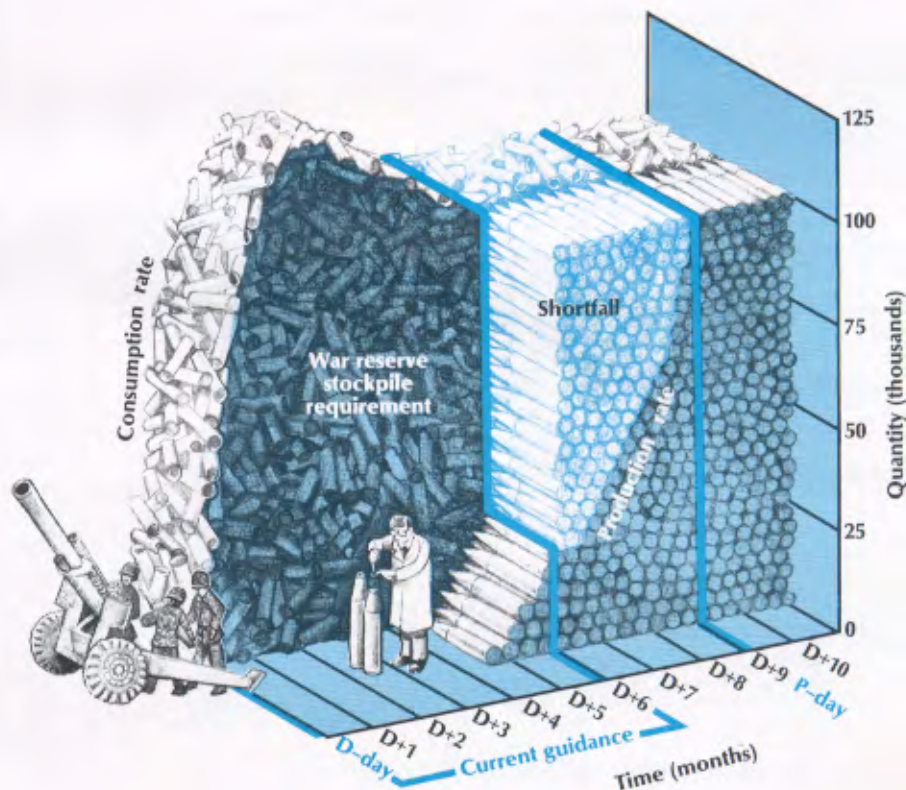
*Has DOD adequately defined industrial base expectations?* A national policy is needed because of the current threat, limited options, and risks associated with an unresponsive industrial base. If the policy reinforces the goals of obtaining a responsive base and being able to sustain conventional war as long as any potential adversary, a companion question that must be addressed is—*How much is the United States willing to invest in this sustainability?*

in place to make up the net deficiency that occurs between D-day and P-day. The trade-off involves spending money on stocks versus improving the production capability—the warmer the base, the quicker the response, the less need to stock and maintain such stocks.

The key factor in the D to P concept is an accurate determination of wartime consumption rates. Once this determination is made, peacetime stockage to support wartime consumption from D-day to P-day can be computed by adding peacetime production, plus supply pipeline support stocks, plus the basic loads of the units, minus the anticipated wartime consumption. The difference will indicate the needed peacetime stockage. Once hostilities begin, changes can be expected in the computational factors and allowed for in the D to P planning process.

ALOG

D to P concept for a typical ammunition item.





Program objectives memorandum covering fiscal years 1978-82

Program objective memorandum covering fiscal years 1979-83

Program objectives memorandum covering fiscal years 1980-84

Program decision memorandum covering fiscal years 1980-84

Facilities sized to support total mobilization

Allowable sizing reduced to equivalent of 180-day authorized acquisition objective

Further reduction to 90-day authorized acquisition objective (plus NATO)

Further reduction of facility sizing to that supporting the 5-year-defense-plan buy

□ Ammunition facility sizing criteria.

To what extent and how well does DOD use the D to P concept when making investment decisions? D to P planning is essential in making these decisions since one major inadequacy of industrial preparedness planning today is that the link between reserve stocks and production response is missing.

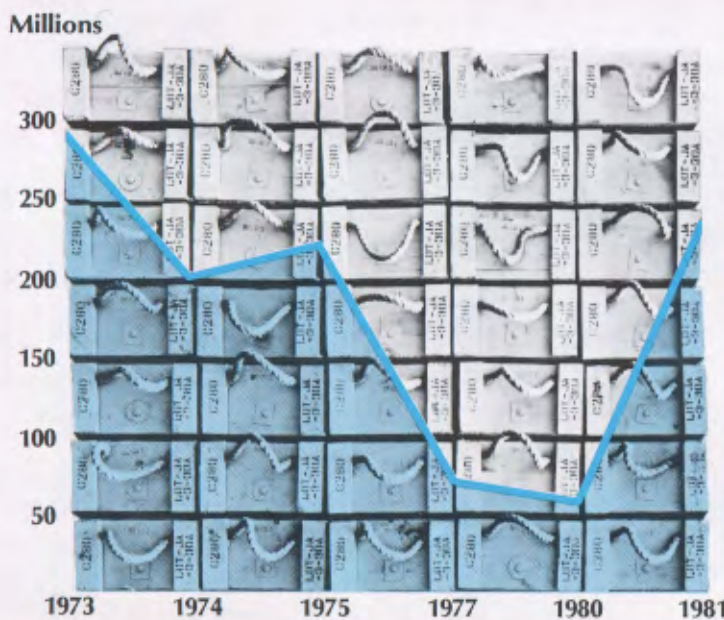
Has DOD adequately identified existing deficiencies in the existing ammunition base, such as the Army's reported \$1.25 billion worth of facilities and equipment deficiencies, 73 percent of which are categorized as premobilization day deficiencies? Is DOD planning to

reduce or eliminate these production bottlenecks, and how soon can these corrections be completed?

What is being done to ensure that sufficient skilled personnel are available to meet increased defense needs during mobilization? Industry is finding it difficult to meet its peacetime needs for skilled personnel in such key industrial trades as technicians, toolmakers, and machinists.

The DOD must address these issues to eliminate (or at least reduce) materiel shortages and ensure that the Nation's wartime needs for defense systems, equipment, and components can be met. Answers to the issue questions are needed now to assure that prudent decisions are made in current expenditures for ammunition. Unless these questions and trade-offs are adequately considered, there is a great risk that a balanced investment strategy will not be followed and that maximum improvement in military capability will not be achieved with the programed funds.

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□ Monthly rounds requirement, 1973-81.

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# Standardizing Nuclear Ordnance Items

by Frank L. Vito

Contrary to popular belief, the nuclear community and its agencies do not have unlimited funds. In this respect, they are like most other Government agencies and activities.

Problems with cost overruns and deficiencies in contractors' performance have focused attention on the need for standardizing nuclear ordnance. Aggressive and positive measures are needed to control the proliferation of repair parts and to standardize items to ensure that stocks are at a manageable level yet adequate to meet the needs of the military departments.

The Department of Defense has prescribed that nuclear ordnance be standardized to the maximum degree feasible. The objectives of the nuclear standardization program are to improve operational readiness of the military departments and to ensure cost-effective mission performance. The program stresses efficient use of resources and use of proven off-the-shelf products to help control proliferation of parts and to reduce life cycle costs.

Nuclear ordnance includes all items used on or with nuclear weapons. Such items must be controlled because of design, security, safety, or quality considerations. These items fall into two groups. The first includes end items, assemblies, systems, and parts designed, manufactured, or under the control of the Department of Energy or one of the military departments that are specifically for use in nuclear ordnance. The second includes standard commercial end items, assemblies, and parts that were subjected to special testing or quality control by the Department of Energy or one of the military departments before being selected for use in nuclear ordnance applications.

The standardization program, which was enacted into law by Congress, is designed to establish a cost-effective effort that will provide savings for the Department of Defense in the areas of engineering, acquisition, and supply management. In today's world of austere budgets, this goal becomes even more significant and of vital importance. Standardization efforts should not be subordinated. These efforts should

continue and projects having the greatest potential for savings should be initiated on a priority basis.

Nuclear ordnance is managed differently from other commodities in design, development, safety, maintenance, and the supply-related functions of inventory control, inventory management, and Federal cataloging. It does not conform to the policy and general philosophy used to define conventional products and standardization areas.

The nuclear ordnance program specifies that existing standards, specifications, and drawings of features, materials, and parts be used and that engineering practices currently in use be followed during the development process. The design agencies for the Department of Energy—Sandia National Laboratories, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory—assist the Department of Defense in weapon conceptual efforts by providing system studies, engineering analyses, feasibility studies, and feasibility study results.

The major role played by the Department of Energy in nuclear weapon design and development limits the role of the Department of Defense in nuclear ordnance standardization to those areas specified by the Department of Energy. Another factor having an impact on standardization is that both Department of Energy and military department design and production are usually sole source, and provisioning for associated components is generally done on a life-of-type basis. These factors reduce the requirement for product or non-product documents.

The Defense Standardization Manual, DOD 4120.3-M, dated August 1978, assigns the lead service or assigned activity for the nuclear ordnance area certain responsibilities. These include—

- Planning, originating, and coordinating required directives and procedures for Department of Defense-wide implementation of materiel management improvement programs pertaining to the standardization of nuclear ordnance items.
- Accomplishing item entry control technical review



functions for all nuclear ordnance items entering the Federal supply system.

- Controlling, monitoring, and assigning numbers for nuclear ordnance projects.
- Monitoring or conducting document projects to develop and maintain specifications, standards, and handbooks.
- Conducting or monitoring item-reduction studies.
- Compiling and coordinating technical data for publication in joint nuclear weapons publications relating to standardization.

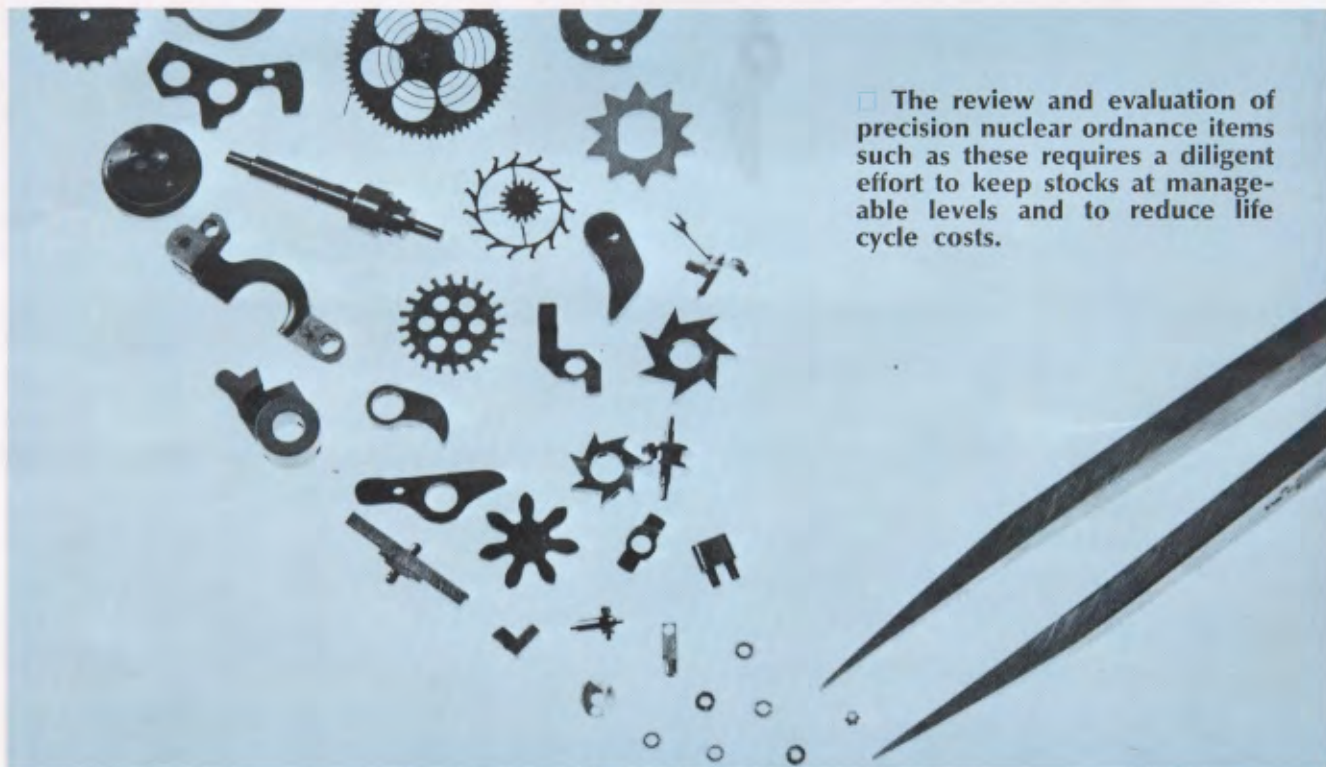
Three basic study projects are used to control proliferation of nuclear ordnance items—item entry control, item reduction, and development and standardization of documents.

The review and evaluation of Department of Energy and military department nuclear ordnance items entering the supply system represents a continuing work

project. Entry review of an item submitted for federalization is conducted to determine if it is a duplication of an existing item or if it is interchangeable or substitutable. This manual review—dictated by the comparatively small number of items entering the system—parallels an automated review procedure performed by the Defense Logistics Services Center in Battle Creek, Michigan.

The key factor in determining item duplication is the availability of technical data. Such data are usually in the form of a technical data engineering package, prepared by the agency submitting items for entry into the system. Item entry control is effective only when an adequate technical data package is available at the time of screening.

A technical data package consists of plans, drawings, and associated lists, specifications, purchase descriptions, standards, models, performance require-



□ The review and evaluation of precision nuclear ordnance items such as these requires a diligent effort to keep stocks at manageable levels and to reduce life cycle costs.



ments, quality assurance provisions packaging data, and application. Data packages may not always be available at the time of the request for national stock number assignment or for emergency requests. This information is required as soon as it becomes available, however. When data packages are received at a later date, the item is screened to see if it matches existing items in the system. If it does, the item is deleted. This control is in contrast to the item-reduction process, which is a means of purging duplicative items from the system.

Item-reduction projects are usually initiated when there are a large number of similar items and the expected results are sufficient to justify the cost. The items can be grouped and examined by item name or other characteristics. Such studies are usually initiated and conducted by the assigned activity because of the availability of technical data to conduct the study. These studies range in purpose from making a determination of unneeded items in the supply system, to a technical review of duplicative, overlapping, and obsolete items, to making a reduction in the number of similar items. These studies are controlled by a project number to ensure their timely completion.

There are over 200 Federal supply classes affecting nuclear ordnance. Due to the fact that many of these classes contain less than 200 items, item-reduction studies may not be cost-effective on a formal basis and, therefore, the items must be reviewed individually as resources become available.

Another means of limiting expansion of items in the supply system involves development and use of specifications and standards (Government and non-Government) controlling nuclear ordnance. The Department of Energy is the basic source for engineering data and retains ownership and control over this technical data. Military-department-developed data must interface with Department of Energy requirements and, to this extent, is limited and subject to the terms of the governing contracts and memorandums of understanding between the military departments and the Department of Energy.

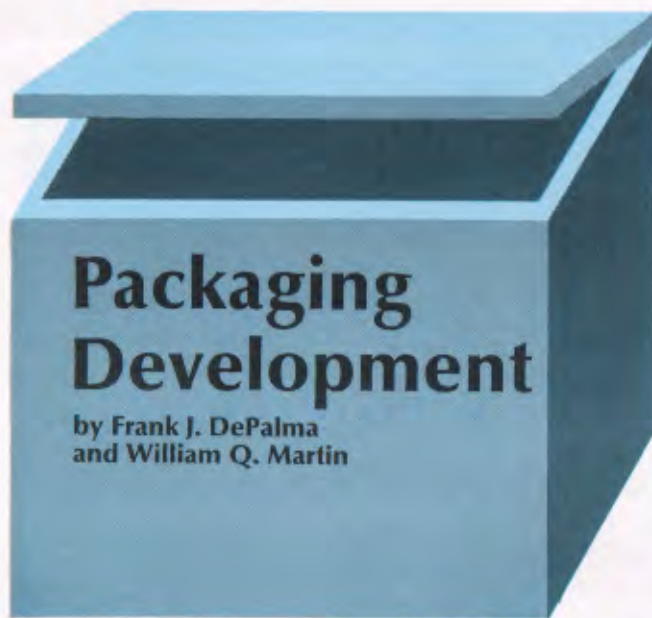
To preclude improper use of such data, extreme care must be taken to ensure dissemination to intra-

departmental agencies with a need-to-know or valid operational requirement. Acquisition of nuclear ordnance items controlled by a military department in accordance with specifications has been hampered by this operational requirement.

The result is a major dependence on, and use of, limited coordinated documents for the acquisition of nuclear ordnance items. For this reason greater control by the assigned activity is required. Nuclear ordnance policy is disseminated by means of the Nuclear Ordnance Standardization Document Program Plan and the Program Analysis for Federal Supply Group II. These documents are intended to identify the course of action necessary to achieve the greatest degree of standardization of procedures, practices, and techniques. These documents are management tools for the nuclear community to use as planning guides. They include information on setting objectives, evaluating problems, establishing panels or task groups, determining priorities, monitoring progress, evaluating the allocation of resources, and identifying work backlogs.

Standardization goals can be met if all activities involved in nuclear weaponry take a positive approach to standardization planning. Involved parties must be aggressive in pursuing the goal of standardization and must fully cooperate in all coordinated efforts. Coordination of nuclear ordnance matters must be close and detailed. Everyone in the nuclear ordnance community has a responsibility to use fully coordinated standards and specifications and to be cooperative with the department having primary responsibility. **ALOG**

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**P**ackaging of materiel to afford the highest degree of protection has reached a level of sophistication that is far more complex than at any time in the history of logistics. Today's project managers must recognize that delivery dates for items can slip if development of packaging for the item does not keep pace with item development. The expertise and knowledge that packaging-oriented personnel bring to the research and development phase of the acquisition process should not be minimized. During this phase, emphasis must be placed on timely, economical, and efficient delivery of the item.

The packaging goal of the Department of Defense (DOD) may be summarized as an effort to provide adequate, uniform, and economical item protection to ensure that materiel received by the combat soldier will be in serviceable condition regardless of storage or shipping hazards involved. To the extent practical, the vendor will provide this protection in a manner that will ensure an uninterrupted flow of supplies through the logistics pipeline.

Until our entry into World War II, the packaging of military supplies and equipment had not been emphasized, and the Army had relied on nailed wooden boxes and crates almost exclusively as exterior containers. Immediately after our entry into World War II, combat leaders and supply officers were shocked to learn that less than half of our materiel was arriving in usable condition. By the end of World War II, the rate of deterioration of supplies in the pipeline had been drastically reduced. This was due in large measure to a crash program of research and development in packaging sponsored by the Army and the Navy.

In the years following World War II, a DOD policy was implemented to decrease packaging cost. This was

accomplished by reducing the level of packaging requirements and encouraging the use of commercial packaging. Subsequently, the problems resurfaced during the Korean and Vietnam Wars and a concerted effort was required by DOD to correct them. New packaging techniques were developed only as a related part of new equipment and systems. Many times personnel from the packaging-oriented disciplines were called on to make on-the-spot determinations to ensure that military supplies and equipment were in usable condition. In general, the logistics system was designed to work in a peacetime situation.

Today, computer technology makes it possible to store and retrieve packaging-related information and enables lightning-fast communication of logistics data. The initial determination for item protection must be made concurrent with item research and development. The same degree of definition is required for packaging requirements as that provided for item development. It is imperative that packaging documentation be available at the time production contracts are let.

Packaging decisions for systems and system components represent a joint effort of packaging personnel, item design engineers, and equipment specialists. Such decisions involve numerous item considerations. Among these are susceptibility of the item to damage by corrosion, the item's degree of fragility, its weight and dimensions, relation of item design to the package, degree of disassembly and breakdown permitted without impairing supply effectiveness, and compatibility of materials.

Another factor they must consider is the military characteristics of the item in relation to its life cycle pattern within the supply distribution system. For example, military combat items must be packaged so that the package does not exceed weights and sizes that the supply system and military personnel can readily handle.

Packaging personnel and the engineers and equipment specialists must also decide on testing of the packaged and packed items. Testing of packages and containers should begin as soon as possible after item development begins. Some tests most commonly used in proving design adequacy include vibration, impact, mechanical handling, rough handling, and environmental. One or more of these tests is usually applicable to the design of military packs.

These tests serve two functions. They ensure that the pack will be adequate to protect the item, and they provide valuable feedback to the item design engineers as to the fragility of components within an item. Special requirements exist for many items. For example, large or complex items such as vehicles, artillery, fully equipped electronics shelters, and missiles often cannot be processed by a single method. This may also be the

case when packaging a kit combining a number of parts of varying degrees of complexity.

Packaging decisions based on packaging requirements must be documented in an approved format. The data should include as a minimum item identification, weight, and size; provisions for cleaning, drying, and applying special preservatives and wraps; required cushioning; unit load; and exterior containers. These data will be included as an integral part of the procurement documentation. During production of the item, packaging personnel should be available onsite or telephonically to provide clarification, assistance, or advice.

Once packaging data have been established for an item, the data are recorded in the cataloging system. The information, which is produced on microfiche, is easily retrieved for use by activities responsible for item packaging at depot or field level or for use in future procurements. The packaging segment of the Army reader microfiche system, produced by the Catalog Data Activity, is the repository for the data. The review and use of these data at the time of subsequent procurement of items should preclude having to re-develop packaging prescriptions.

Another source of packaging information is the packaging data microfiche file, produced by the DARCOM Packaging, Storage, and Containerization Center, located at Tobyhanna Army Depot, Pennsylvania. This file contains over 50,000 images of actual packaging prescriptions recorded on packaging data sheets or standards. These provide invaluable data to the logistics supply line.

After an item has been produced and cataloged, forward movement to the user begins. In some cases, delivery to the user is made by the vendor. In the majority of cases, however, movement is through the depot system within the continental United States. During the time an item is at the depot, it passes through a receipt, storage, and issue process that includes evaluation of item packaging to ensure that the item will withstand the expected rigors of the distribution system and still arrive at the point of use ready to function as intended.

Throughout this process, user considerations should be paramount. Item packaging should provide sufficient identification to satisfy user requisitioning and inventory processes. If personnel open items carefully at the destination point, packaging materials can be reused to package similar items for retrograde. The Army tries to provide lightweight reusable fiberboard containers that greatly simplify the packaging of small, expensive items for return—for example, printed circuit boards, modules, and instruments.

Proper use of existing packaging skills will go a long way toward ensuring that requisitioning activities will receive what they need, in the quantity ordered, and in usable condition. Throughout the years, great reliance has been placed on packaging doctrine and principles, many of which have been handed down from generation to generation and remain valid for use today. These principles of logistics support, developed at great cost, depend on the simple assumption that systems, equipment, and components will be adequately packaged.

Packaging expertise is available and should be used to the fullest during all phases of life cycle management.

**ALOG**

*Frank J. DePalma is chief of the packaging branch, Army Communications-Electronics Command. With over 40 years in military packaging, DePalma helped to prepare the Army's first packaging design handbook and to develop a pilot course in packaging engineering.*

*William Q. Martin is chief of the packaging branch, Army Armament, Munitions and Chemical Command. He is a graduate of the University of Kansas. His Department of the Army civilian career includes CONUS assignments at two depots and two national inventory control points.*



□ Definitions, AR 310-25

Prelude to Solid Shield—

# Lifeline Logistics

The Army recently completed the largest tactical logistics field training exercise ever conducted in the continental United States—Lifeline '83. The 2-week exercise involved 67 Active Army units and 89 Reserve component units operating in 9 eastern states. Lifeline '83, conducted by the 1st Corps Support Command, Fort Bragg, North Carolina, tested the Army's ability to move its soldiers and their equipment by land, air, and water in a simulated wartime environment. Reserve component units provided the majority of supply, maintenance, field services, and medical support.

The principal tactical units came from the 24th Infantry Division (Mechanized), Fort Stewart, Georgia. The 24th Division units successfully performed a unique maneuver termed a "simulated multimodal tactical deployment." The action included moving the division's assault battalion task force by road and rail from its home station at Fort Stewart to a port of embarkation 71 miles away at Brunswick, Georgia. At Brunswick, the task force loaded onto a fleet of landing craft (LCU's—landing craft, utility; a Navy LST—landing ship, tank; and a Navy LPD—amphibious transport dock). The craft transported the task force 80 to 90 nautical miles up the Atlantic coast to Savannah, Georgia. At Savannah, the 222 wheeled and tracked vehicles were off-loaded and roadmarched back to Fort Stewart where the units began their participation in Exercise Solid Shield.

This large-scale, multimodal deployment exercise, the first of its kind, provided a valuable opportunity for the participating units to realistically test the skills of their soldiers and the performance of their equipment. Maintenance personnel reported no problems outside of routine organizational-level repairs for any of the vehicles in the convoy.

The photos on the following pages track the 24th Infantry Division's task force through Lifeline '83 and into Exercise Solid Shield.

□ Many vehicles, such as these jeeps (left photo), were backed onto the LCU's to make offloading faster. The LCU fleet made a total of 22 trips from Brunswick to Savannah with an average 12- to 14-hour sailing time. The LCU's (center photo), acting as ferries from the beach, transferred vehicles across the lowered stern gate of a Navy LPD. The LPD was anchored off Jekyll Island, 9 miles away. After taking aboard 89 vehicles, the LPD sailed up the coast to Savannah. A tank (right photo) descends to the lower deck of a Navy LST. Other tanks line up across the Brunswick dock in front of the LST's 112-foot bow ramp. Crews loaded 60 vehicles onto the LST.



□ An armored column from the off at an exit ramp of the interstate

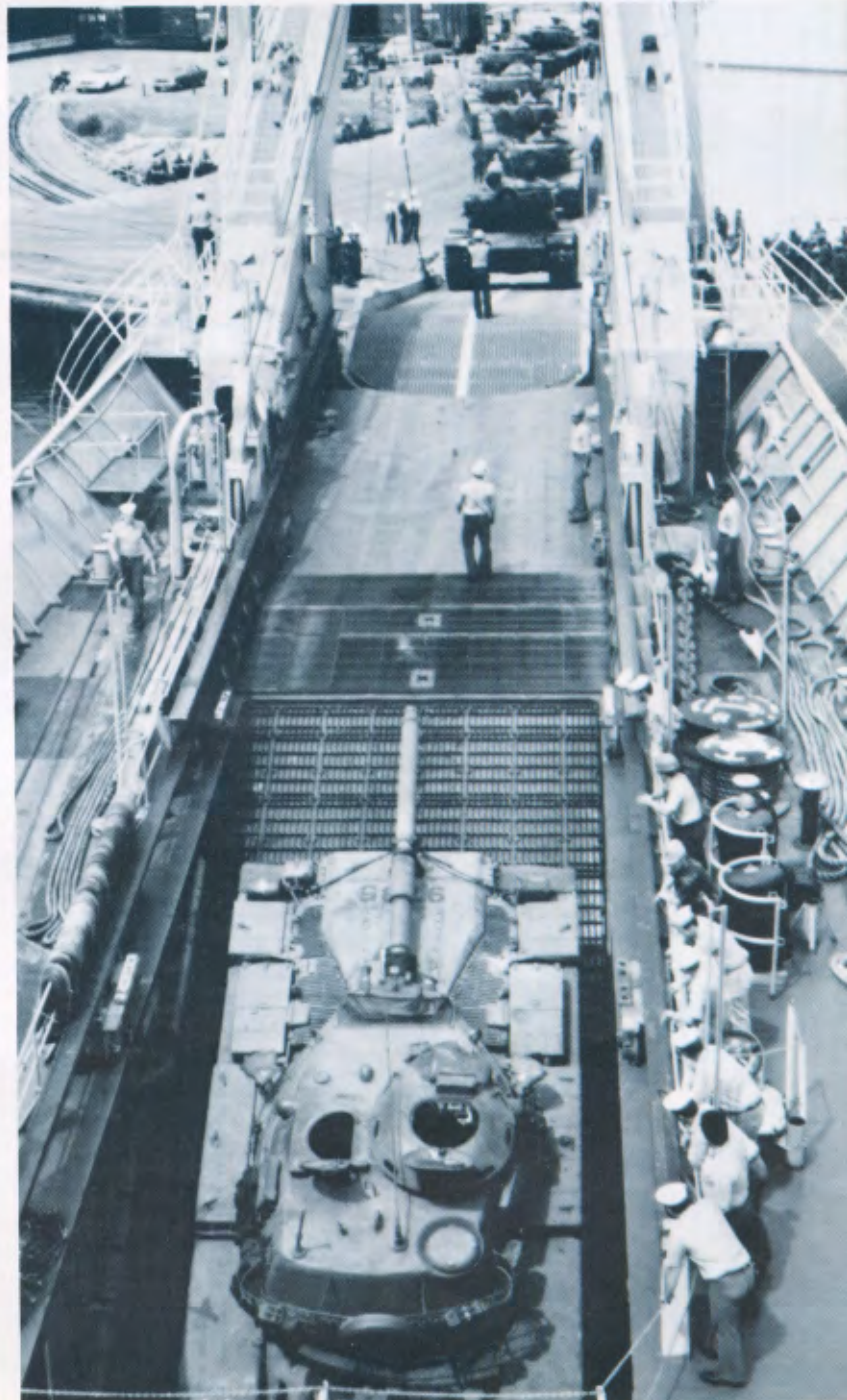




2d Squadron, 9th Cavalry, turns highway near Brunswick, Georgia.



□ Lines of vehicles wait to be driven to the beach loading point on Andrews Island at Brunswick. From the beach, they will be moved aboard LCU's. Masts of Brunswick's shrimp-fishing fleet can be seen in the distance.





□ An Army LCU sails into the busy dock area at Savannah (above) after completing the voyage from Brunswick. The LCU's assemble at the dock area (below) awaiting their turn to be offloaded.

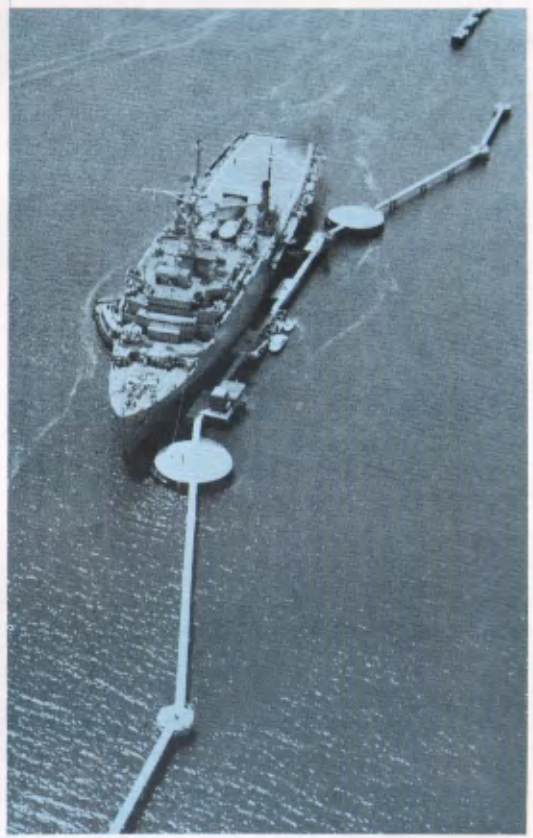


□ A Navy guide assists a driver in off-loading from the LST (above). After the LST's tank deck was emptied of its original cargo, it served as a passage to the dock for vehicles delivered by LCU's. An LCU (right), with its bow ramp locked onto the stern gate of the LST, transfers its load. After unloading, the LCU's were used to ferry vehicles in from the LPD, moored 12 miles away at the Savannah LASH (lighter, aboard ship) facility.





□ The *Ranger*—Army floating crane, BD-6701—lifts a 5-ton truck from the deck of an LCU. The crane from the 73d Transportation Company made the 3-day sea trip from Fort Eustis, Virginia, with the assistance of Army tug boats.



□ The LPD (above), after being emptied by a steady procession of LCU's, prepares to cast off from the Savannah LASH facility. A roadmarch back to Fort Stewart from Savannah (below) ended the Lifeline exercise for the 24th Division.



# Sample Data Collection

by Don Paolini

Field performance data are vital to weapon systems management and the Army force modernization program.

**S**ample data collection is one of the key programs within the Army for collecting maintenance and support data on fielded equipment. It also provides field performance data to equipment developers, users, maintainers, and supporters. A major factor influencing the need for real-time data on fielded equipment is the continued development of more sophisticated and powerful equipment.

The Army's sample data collection program is an outgrowth of an Army study conducted in 1968 to evaluate the cost and effectiveness of its data collection system, known as the Army equipment record system (TAERS). The evaluation showed that the volume of maintenance and performance data collected was too burdensome on troop units and too voluminous for timely processing. It also revealed that the cost of collecting and processing the data was prohibitive and that the validity of the data itself was sometimes questionable.

As a result, the Army modified the TAERS and subsequently it became known as the Army maintenance management system (TAMMS). The requirement for field reporting of organizational maintenance data, with the exception of aircraft, was deleted and the number of items required to be reported to the national level reduced. A year later the requirement for field reporting of support maintenance data for items other than aircraft was deleted. These modifications eliminated costly and time-consuming collection of large quantities of unnecessary data. In conjunction with these changes, the Army recognized that a need existed for supplemental information not available through the existing data collection system. The publication of AR 750-37, Sample Data Collection, in March 1971 established policy for the collection of selected data on specific equipment.

Late in 1982, the program was modified and AR 750-37 was revised to reflect the program changes. The proponent agency must now prepare and staff a concept paper at least 9 months before the expected implementation date of a proposed collection program. This gives other interested commands or agencies the opportunity to make changes and additions to the program. All proposals for sample data collection must be fully justified before the Department of the Army will approve them. The key to a successful program is discipline, flexibility, economy, accuracy, and timeliness.

Three methods are authorized by AR 750-37 for collecting data—free flow, semicontrolled, and controlled.

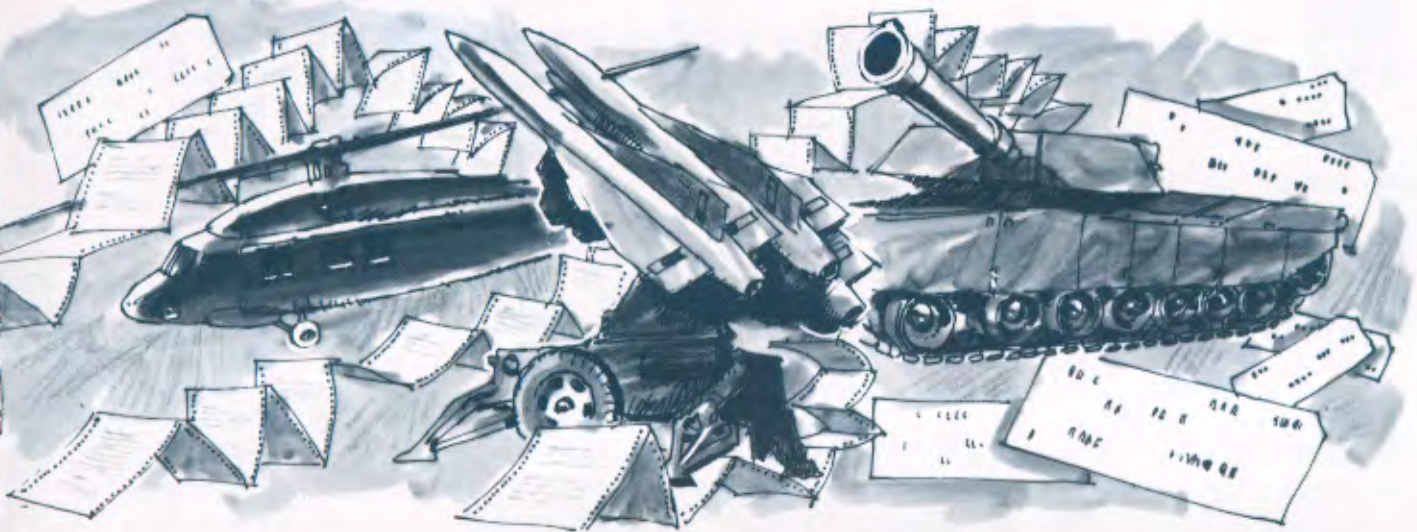
**Free flow.** With this method, selected field units record data on standard forms and forward the forms to the national level directly from the field without any control.

**Semicontrolled.** With this method, selected units record the data on standard forms or slightly modified TAMMS forms under the supervision of onsite data collection program proponent personnel who provide training, assistance, review, and edit. Onsite personnel verify data and forward completed forms to the national level.

**Controlled.** This method is the backbone of the data collection program because it permits the collection of complex, specialized data. With this method, onsite program proponent personnel record the data on standard forms or specially designed forms and forward them to the national level.

Since implementation of the program in 1971, 31 data collection programs have been completed. Currently, data are being collected for 15 selected items of equipment and systems, including the Black Hawk helicopter and M1 Abrams tank, communications security equipment, troop support items, missile systems, and





large-caliber weapon systems. Future plans include the M2 and M3 Bradley fighting vehicles, the Patriot missile system, and the Sergeant York division air defense gun.

Equipment improvements and benefits in many commodity areas are a direct result of the sample data collection program. The Army Training and Doctrine Command is using the data to revise school training so that it will accurately reflect maintenance requirements. The Army Troop Support and Aviation Materiel Readiness Command uses the data to assess Black Hawk performance as required by the incentive award portion of the production contract. The data collected on tank-automotive equipment have led to identification of frequent transmission failures on the M915 vehicle and the subsequent validation of an upgraded configuration. Ongoing programs designed to assess the adequacy of the product-improved M113 family of vehicles and the performance of Mainz- and Anniston-converted M60A3 tank engines have used these data.

In addition, the data have served to validate the performance of highly sensitive communications security equipment and are currently being employed to monitor the performance of vital radio sets through the use of special metering devices. As for the Army's large-caliber weapons such as the M102 howitzer, the data has resulted in improved mission reliability and justified the elimination of \$2 million worth of proposed product improvement program actions on the M102 breech.

The need for the sample data collection program and its importance to the Army have increased significantly over the last 2 years because of the ongoing Army force modernization program. This trend will continue over the next 3 to 4 years when many new weapon

systems of increased technical complexity are fielded on an accelerated basis.

Data collected through the program are used by the Army to assist in obtaining the best equipment performance and in fine tuning its logistics support. Recently, the House Armed Services Committee requested the Army to generate better quantitative data in support of upgrading the Army tactical vehicle fleet. The data would be used in identifying when it is economically desirable to replace vehicles.

Field performance data provided by the program are vital to weapon systems management. There is no other source, at the present time, that provides data of sufficient accuracy and detail necessary to measure fielded equipment performance. This includes measuring the adequacy of support concepts, product improvements, technical publications, failure factors, manpower authorization criteria, maintenance allocation charts, and operating and support costs. The capability to accurately establish useful equipment life and maintenance expenditure limits also depends on sample data collection efforts.

Through the use of this information, improvements can be made that will enable us to provide our soldiers with equipment that is more reliable and easier to maintain. The end result will be improved readiness.

*Donald D. Paolini is the chief of the Sample Data Collection Section, Readiness Division, DARCOM Materiel Readiness Support Activity, Lexington, Kentucky. Previous experience includes assignments in the Office of the Deputy Chief of Staff for Logistics; Headquarters, DARCOM; and other special field assignments.*

# Mass Camouflage Painting

by Captain Byron Lester

Sometimes because of required movements or contingency operations, it is necessary to camouflage-paint large quantities of combat and tactical equipment in a compressed period of time. Presently, there are no "how to" manuals to teach personnel how to accomplish this task or how to figure paint, paint thinner, equipment, and man-hours required.

As a part of the Rapid Deployment Joint Task Force, now the U.S. Central Command, the 24th Infantry Division (Mechanized) participated in Bright Star '82, a joint exercise of U.S. forces "fighting" in a desert theater in a Mideast country. As the "heavy division" team player under the XVIII Airborne Corps, the 24th's mission is to tailor a mechanized force to deploy into any region of the world on short notice. In this instance, the 24th was responsible for the mass camouflage-painting of equipment to match the new surroundings. The result of this effort was a fleet of 600 combat vehicles, tactical vehicles, and major pieces of equipment painted within a 9-day period.

The methods used by the 24th to compute materials and manpower are not found in Army publications or regulations but can be used in determining camouflage-paint requirements for one vehicle, vehicles of a company-sized unit, or vehicles of an entire division.

This is how we did it. First the brigade commanders met with the division support command commander and his staff to determine the equipment to be deployed and the tasks that would be required to camouflage-paint that equipment using alkyd-enamel paints. They established a timeframe in which the mass camouflage-painting would have to be completed. Once this was done, they assigned areas of responsibility and tasks.

The commanders reviewed after-action reports and photographs of previous exercises to determine the predominant colors in the anticipated operational area in order to match them as closely as possible. They selected colors and alternative colors and made sure that the alkyd-enamel paints were available either in the division or from the wholesale level. Plans were made to expedite paint shipments if that became necessary.

Next, the brigade staffs developed lists of the actual pieces of equipment that they would deploy and categorized that equipment according to size. Category I was small equipment and included the M101A1, M105, and M416 trailers, the M151 and M880 prime movers,

and other similar equipment. Category II was all medium equipment and included the 2 1/2-ton cargo truck, the 5-ton cargo truck, and others such as the M557 and M113. Category III was large, outsized pieces of equipment and included M60 tanks, M88 recovery vehicles, M109 vans, heavy-equipment trailers, stake-and-platform trailers, and similar equipment.

The planning effort continued by taking these data and making a chart of the vehicles and equipment to be painted. The vehicles and equipment were separated into the three categories according to size, and the number of items in each category was totaled. Correction factors were developed based on data from previous painting projects and were used as constants with the three categories.

From these data, a factor chart was developed. By processing the data in the factor chart, the quantity of paints and thinner, the man-hours, and the costs of the

	Number of Vehicles	100% Sand Color	
		Gallons per vehicle	Total gallons
Category I	2,603	.5	1,301
Category II	2,158	2	4,316
Category III	664	3	1,992
<b>Subtotal</b>			<b>7,609</b>
<b>20% Correction factor</b>			<b>1,522</b>
<b>Total</b>			<b>9,131</b>
<b>NSN</b>		<b>8010-00-111-8336</b>	
<b>Unit of issue</b>		<b>5 Gallon</b>	
<b>Cost</b>		<b>\$36.50</b>	
<b>Required quantity</b>		<b>1,827</b>	
<b>Cost</b>		<b>\$66,656.30</b>	

□ Representative data and suggested method of

Methods developed by the 24th Infantry Division (Mechanized) can determine the materials and manpower required to camouflage-paint one vehicle or the vehicles of an entire division.

mass camouflage-painting project were determined. The factor chart (shown below) gives representative data and shows the suggested method of calculating requirements to camouflage-paint the equipment of a mechanized division.

Once division personnel had completed these estimates, they inventoried the supply of the needed paints and painting equipment on hand and identified short-falls. They requisitioned paint and equipment that was available through the supply system and initiated work orders for equipment repair as required. Items not available through the supply system were obtained through local purchase.

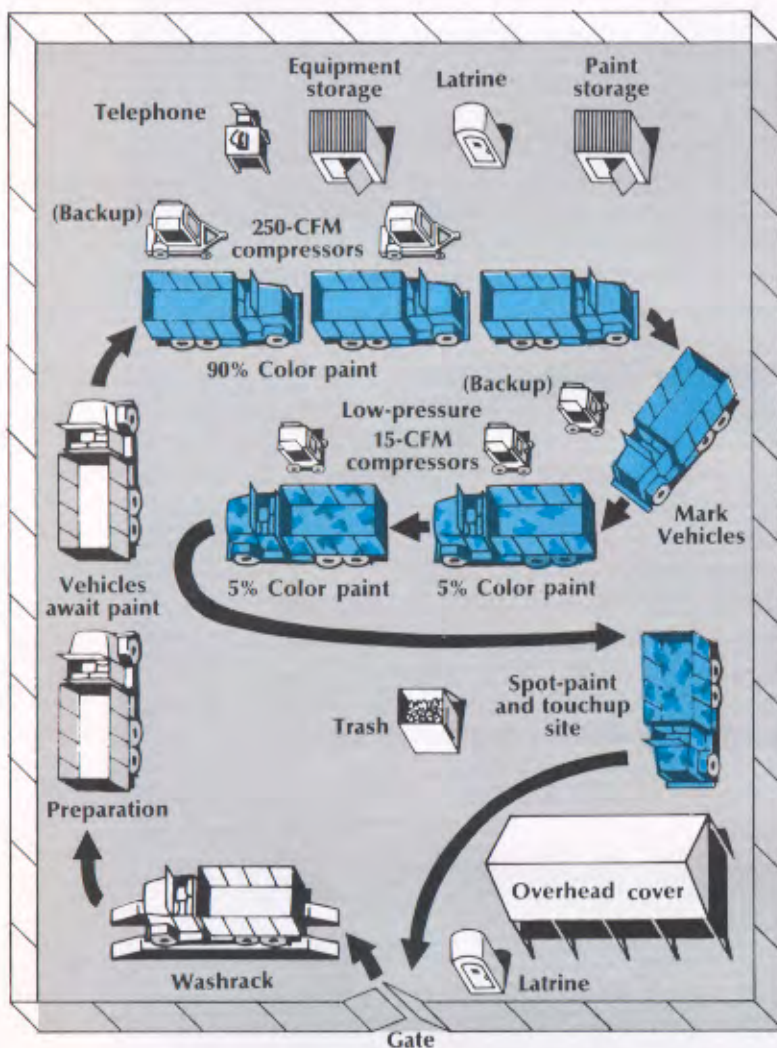
Next came selection of the paint site with two alternative sites identified. The site selected covered approximately 150,000 to 200,000 square feet, offered overhead cover in case of inclement weather, and provided access to tank trails for tracked vehicles. It was

isolated enough to protect against paint overspray, yet it was accessible enough to allow the quick movement of vehicles, supplies, and equipment. Lighting for night operations and a telephone hookup were also available at the selected site. The site was fenced for security and division personnel tailored the painting layout to fit the area.

The next step in the camouflage-painting project was organizing the manpower necessary to accomplish it. The maintenance battalion was tasked to provide an officer-in-charge, a noncommissioned-officer-in-charge (NCOIC), and a quality assurance specialist to oversee the project. The battalion also provided a painting NCOIC, a maintenance NCO with two mechanics, and a marking NCO with one helper to supervise the paint operation, quality control, and maintenance of the painting equipment. The deploying units provided the troop labor to do the actual painting.

45% Field Drab Color		5% Earth Yellow Color		5% Black Color		Xylene Thinner		Man-hours	
Gallons per vehicle	Total gallons	Gallons per vehicle	Total gallons	Gallons per vehicle	Total gallons	Gallons per vehicle	Total gallons	Per vehicle	Total
.25	651	.1	260	.1	260	.2	520	3	7,809
1	2,158	.2	431	.2	431	1.5	3,237	5	10,790
1.5	996	.3	199	.3	199	2	1,328	6	3,984
	3,805		890		890		5,085		22,583
	761		178		178		1,017		4,517
	4,566		1,068		1,068		6,102		27,100
8010-00-111-8129 5 Gallon \$37.50		8010-00-111-8130 5 Gallon \$44.00		8010-00-111-8356 5 Gallon \$29.00		6810-00-290-4166 55 Gallon \$80.00			
914 \$34,275.00		213.6 \$9,398.00		213.6 \$6,194.00		111 \$8,875.00		Total Cost \$125,399.00	

calculating requirements to camouflage-paint the equipment of a mechanized division.



□ Paint site layout.

The maintenance battalion also provided four experienced painting NCO's. Each painting NCO was assigned two soldiers from a troop unit to do the actual painting. Completing the painting team was one maintenance NCO who had two mechanics assigned to maintain the painting equipment and one marker NCO with one helper assigned to handle the vehicle marking tasks. The painting teams were structured to allow personnel working directly in the painting area to work every other day because of the paint fumes and the fatigue of working 14- to 16-hour days. When painting operations began, 30 vehicles a day were scheduled. As proficiency increased, vehicle input increased to 60 a day.

To clarify who was to provide necessary materials, the maintenance battalion developed an item checklist showing which items of supplies and equipment would

be a unit responsibility and which would be a responsibility of personnel at the paint site. The checklist was distributed to unit drivers and to supervisors of the painting operation.

Once the paint site was operational, a vehicle was run through it to test various camouflage color schemes. The literature on camouflage-painting indicates a four-color paint pattern broken down into 45 percent, 45 percent, 5 percent, and 5 percent. After viewing the test-painting schemes, the brigade commander decided on a three-color camouflage scheme of 90 percent, 5 percent, and 5 percent, which not only produced the preferable camouflage pattern for the operational area but also speeded the mass painting. For example, Training Circular 5-200 indicates 30 man-hours required to camouflage-paint an M60 tank. This time was reduced to 6 man-hours. A three-man team was able to paint an M60 from start to finish in just 2 hours.

The actual paint site was set up as shown in the chart on the left. Paint pods were powered by 250-cubic-foot-per-minute (CFM) compressors. These were used for the 90-percent base coat color (sand). After the paint teams tried various painting techniques, they found it to be more efficient to paint the entire vehicle with the 90-percent base coat and then overpaint with the two 5-percent colors (field drab and earth yellow).

Paint sprayguns powered by 15-CFM compressors were used to apply the two 5-percent colors. The 15-CFM compressor engines could not hold up under the constant 14- to 16-hour-a-day use. These engines had to be replaced every 2 days, even though maintenance personnel changed the oil every day. The maintenance crew could bolt replacement engines into position within 30 minutes, while troubleshooting a malfunctioning engine sometimes took hours. After the first day, the crew kept extra engines on hand. Sprayguns also began to break down after the third day. Certain brands of sprayguns proved far superior to others.

Despite the problems, painting the 600 vehicles in 9 days was quite a feat. The 24th Infantry Division (Mechanized) gained valuable experience and the methods developed can be adapted for use by other units regardless of the number of vehicles to be painted.

**ALOG**

*Captain Byron Lester, currently on duty in Korea, commanded Company D, 724th Maintenance Battalion (Heavy), 24th Infantry Division (Mechanized), Fort Stewart, Georgia. He holds a B.S. degree from Embry-Riddle Aeronautical University, Daytona Beach, Florida, and an M.A. degree from Central Michigan University, Mount Pleasant, Michigan.*

# Operational Concepts in Four Logistics Areas Developed

**O**perational concepts for combat, combat support, and combat service support are being developed by the Army Training and Doctrine Command (TRADOC) and its associated centers and schools. The concepts, to be published in the 525-series of TRADOC pamphlets, describe the functions that the various levels of command will accomplish during combat.

Training and Doctrine Command personnel responsible for training, organization, doctrine, and materiel development will use the operational concepts as guides in planning their various programs. The operating forces will also use them to identify future trends in the Army, to disseminate information on emerging doctrine before the operational concepts are incorporated into doctrinal and training literature, and to support training for the transition to new systems and procedures.

The four logistics or logistics-related operational concepts that have just been published or which are nearing publication are described below.

## Three-Category Maintenance

Under an operational concept nearing completion, a three-category maintenance system will replace the current four-category system. The new categories will be unit, intermediate, and depot, with the unit (currently organizational) and depot maintenance functions remaining unchanged. The intermediate maintenance category has two levels—forward and rear—similar to the current direct and general support levels. Under the concept, units in the intermediate forward category will be organic to the division, assigned to the corps, and located at echelons above corps. Intermediate rear units will be located at the echelons above corps level instead of in the corps area where general support maintenance is now performed.

The Army Logistics Center is designing the three-category maintenance system to be more responsive to battlefield maintenance needs and improve operational readiness by increasing battlefield mobility and flexibility.

## Water Support

An operational concept for water support in a theater of operations has been prepared by the Army Quarter-

master School to support the Airland Battle 2000 doctrine. The concept describes procedures and resources required to supply potable water to the Army in the field and, when necessary, to other services and allied forces. It addresses direct support operations from separate brigade through echelons above corps and establishes a general support capability in areas where direct support systems cannot provide enough water. The concept also describes environmental impacts of operations in tropical, arctic, or arid regions and covers new equipment, organization, and training requirements.

## Host Nation Support

The Army Combined Arms Center developed the operational concept for host nation support of U.S. Forces in wartime. The concept covers factors that must be considered in determining both the suitability of host nation support to accomplish specific missions, and the possible types of support available. Command and control and the functions of civil affairs personnel in acquiring and coordinating host nation support are included, as are force structure implications and training requirements. Appendices to the TRADOC pamphlet will detail host nation support to rear area protection, combat support and combat service support operations, and matrices of support in the communications zone and combat zone.

## Civil Affairs

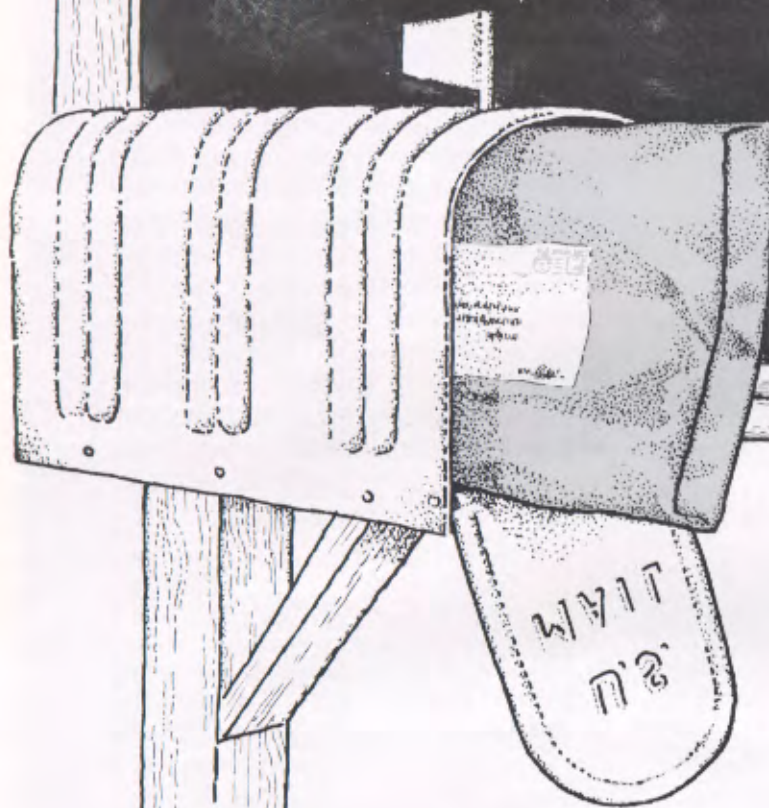
The operational concept for civil affairs has been published as TRADOC Pamphlet 525-31. It provides the basis for the new version of FM-41-10, Civil Affairs Operations, now being developed. It describes the activities that establish or improve relationships between U.S. Forces and the populations and authorities of the nations in which the forces are operating, including coordinating host nation support and rear area protection.

Recently published logistics-related operational concepts are included in the listing on page 44. *Army Logistician* will continue to cover operational concepts for logistics as they are developed.

**ALOG**

# Logistics Training by Mail

by Sergeant First Class Steven D. Hight



In the increasingly technical area of supply operations and management, it is extremely important that the Army provide itself with a well-trained civilian work force. Although military personnel receive military occupational specialty (MOS) or branch qualification technical training through career-progression courses, the civilian supply clerk training is sometimes ignored or given low priority.

Although recent changes in the civilian personnel management system require the supervisor to develop an individual development plan for each civilian employee, many civilian supply clerks do not receive required or related career training. Each supply supervisor is responsible for ensuring that civilian supply clerks are provided adequate training to perform assigned tasks and for allowing each employee to qualify for higher levels of responsibility. This is not to say that effective written communication, sexual harassment, personal assessment, and other similar courses are not worthwhile. But these courses should be in-

corporated into a good training program, perhaps under the heading of "general studies" training.

In these times of funding constraints, budget cuts, and problems in obtaining school allocations for resident courses, a supervisor must develop alternate and diversified training programs. One alternative to resident schooling is the correspondence course program either through individual course enrollment or group study programs. Some excellent sources for logistics-related training are available. Training sources with addresses are shown in the chart.

**Army Logistics Management Center (ALMC), Fort Lee, Virginia:** The Center offers many excellent courses oriented to table of distribution and allowances (TDA) and installation supply operations, rather than to table of organization and equipment (TOE) units. One example is the Equipment Management-Property Accountability Course which teaches students about supply publications, authorization documents, document registers, manual property books, supporting document files, and other supply functions within a TDA activity. The Center operates an extremely responsive correspondence course program. Courses available through the correspondence mode range from basic introductory courses to highly technical and specialized courses. The Center also offers a certificate program that recognizes a student's accomplishment for completing a series of courses within a specific area of interest, such as disposal operations, physical distribution management, and similar courses. Many courses available through the ALMC program have been recommended by the American Council on Education for graduate and undergraduate credit.

**Joint Military Packaging Training Center, Aberdeen Proving Ground, Maryland:** This school offers six courses in the correspondence mode covering basic preservation and packing, packaging, and other shipping and storage techniques. These courses are designed to provide entry level training in those areas.

**Commandant**  
Army Logistics Management Center  
ATTN: DRXMC-ET-C  
Fort Lee, VA 23801

Army Institute for Professional Development  
US Army Training Support Center  
Newport News, VA 23628

**Director**  
Joint Military Packaging Training Center  
Aberdeen Proving Grounds, MD 21005

**Training organizations.**

**Army Institute for Professional Development, Newport News, Virginia:** Civilian employees may enroll in many individual subcourses in specific subjects. Department of the Army Pamphlet 351-20-14 lists those subcourses that are developed by the Army Quartermaster Center and are available through the Professional Development Institute. The majority of the supply courses offered are oriented toward TOE activities.

Individuals can enroll in correspondence courses by submitting a DA Form 145 through their chain of command to the appropriate school. If an individual does not meet the required prerequisites for a course, a written request for waiver should accompany the enrollment application. The various school course catalogs are usually available from or can be obtained by the training coordinator of the servicing civilian personnel office. The civilian personnel office can be a great help in preparing and submitting enrollment applications.

One important point to remember is that civilians who are awarded diplomas or certificates of completion for correspondence course work should submit a SF 172, Amendment to Personal Qualifications Statement, to ensure that their personnel records are updated to reflect training completed and experience gained. These correspondence courses can be very helpful when an employee is trying to qualify for a higher level position.

Supervisors should encourage employees to participate in a self-study program such as the correspondence course program. A good technique to encourage participation, if mission and job requirements permit, is to set aside a few duty hours per week for work on correspondence courses.

Whatever the method selected, the Army correspondence course program is an effective training tool that can provide employees the opportunity to increase their knowledge and efficiency. This benefits the organization to which they are assigned and the overall logistics effort of the Army.

One final point to remember—and perhaps it is the most important consideration when trying to operate within a reduced budget—is that enrollment in correspondence courses is completely free! **ALOG**

*Sergeant First Class Steven D. Hight is a logistics noncommissioned officer with the Directorate of Automation and Audiovisual Systems, U.S. Military Academy, West Point, New York. He is a member of the Noncommissioned Officer Logistics Program (NCOLP) and a graduate of the Basic and Advanced Noncommissioned Officer Education System, NCOLP Course, Quartermaster Officer Basic and Advanced Courses, and has completed 26 separate correspondence course programs.*

# Putting Quality in

**C**ombat readiness of the Active Army and Reserve components vehicle fleet must be improved. Personnel in a battalion who are most knowledgeable about maintenance are those in the company and battalion organizational maintenance sections. However, many times during maintenance operations or motor stables, company and battalion maintenance personnel simply function as supply people giving out rags, oil, tools, and other necessities and answering questions that come to them. There is also a tendency, and often it is even written policy, for organizational maintenance mechanics to make only those repairs that are written on the DA Form 2404 by the operator. If this is the procedure being followed, then the maintenance operation is destined to fail.

For any maintenance operation to be successful, it must be checked by knowledgeable personnel. Even though commanders emphasize that officers and senior noncommissioned officers be present during motor stables and maintenance operations, in many cases there is still little or no improvement in combat readiness.

A solution to this problem is to establish an organizational quality control program in the battalion maintenance section. An efficient program can be established with just one or two mechanics who are well versed in organizational maintenance. These mechanics would inspect every vehicle in the units as often as possible—at least once quarterly, but once a month would be preferable.

The quality control team would help the battalion commander check the operator and organizational maintenance of the battalion. For example, if the company organizational maintenance mechanics inspect an M60A1 tank with the quality control team, it could take from a minimum of 30 minutes to 4 hours with good mechanics following the technical manual. The time required would depend on the general condition of the tank but would allow for a check of all major components—communications, armament, fire control, automotive, and suspension.

The quality control inspection must be in addition to the preventive maintenance checks and services (PMCS) done by the company organizational mechanics during a quarterly service. It could be conducted with the vehicle's crew and company organizational maintenance personnel present. As the quality control mechanics inspect the vehicle in accordance with the -20 series technical manual PMCS, they



□ Good mechanics follow the technical manual.

could show the crew the checks and services that must be performed in a combat environment.

Organizational maintenance personnel assisted by the tank crew perform the quarterly PMCS. The procedures and instructions for performing organizational PMCS are found in the PMCS section in the -20 series technical manual. All -10 series technical manual PMCS should have been completed before the quarterly organization PMCS are performed. Knowledge of operating and maintenance procedures outlined in the -10 series technical manual is essential in performing organizational PMCS. Organizational mechanics should be familiar with these procedures and know how to perform them.

Since the tank driver is often unaware of the gradual development of defects, organizational maintenance personnel must road-test the tank during quarterly PMCS. Any repairs or adjustments necessary to ensure safe operation should be made before the tank under-

# Organizational Maintenance

by Major Clifford B. Barkley, TXARNG

goes road-testing. All faults and corrective actions will be noted on DA Form 2404, column "a." The item number recorded in column "a" must correspond to the item number in the PMCS section. After deficiencies have been corrected and time permits, an additional road test consisting of not less than 3 miles or more than 5 will be conducted.

As the quality control team makes its quality control inspection of vehicles and equipment, it will make a record of the inspection on the DA Form 2404 that is maintained for each vehicle. Any parts required as a result of the quality control inspection will be noted in column "d" by entering the nomenclature of each part and the national stock number. So-called "collective" parts will be identified with a bracket around the stock number and the word "collective" printed beside the bracket. This procedure will identify repairs that cannot be made until all parts ordered are received.

When this quality control inspection is completed and all parts requirements are known, the battalion organizational quality control mechanics will take DA Form 2404 to the parts clerk who will pull available parts and earmark them for the particular vehicle. If parts are not available, he will prepare a DA Form 2765 without assigning a document number and clip it to the DA Form 2404. The quality control mechanic then gives all DA Forms 2404 and 2765 to the company motor sergeant who will ensure that all entries on the DA Form 2404 are proper and correct.

Every attempt will be made to repair known deadlined equipment before turning in paperwork. If an item of equipment is still deadlined and a part is needed, the DA Form 2404 will be marked with an "X" in column "b." The organizational maintenance sergeant will confirm the status and sign the DA Form 2765. This authorizes the parts clerk and shop supply personnel to order the part using urgency-of-need designator "A," not-mission-capable-supply. The company motor sergeant will check entries on the DA Form 2404 to make sure that all deadlined vehicles not requiring parts are repaired and any vehicles requiring maintenance support are accompanied by a DA Form 2407.

The battalion organizational maintenance quality control team needs to forbid any type of cannibalizing or scrounging and to insist that the class IX requisitioning process be properly used. There are commodity representatives at every post who can trace any number that does not check out as a valid parts number. The

team must have the backing and support of unit level and higher commanders.

Mechanics must be allowed sufficient time to inspect the equipment. They should not be used during motor stables simply as "go-fers" or to look up numbers in technical manuals. The organizational maintenance inspection should be given priority second only to deadlined equipment repairs. A suggested priority for battalion and company organizational maintenance actions would be—

- Repair deadlined equipment faults.
- Conduct an organizational quality control inspection (-20 PMCS) of each item on a periodic basis.
- Train and assist operators in services such as purging (clearing) fire control sights, checking (weighing) fire extinguishers, assuring that gun tubes are synchronized with fire control equipment, and correctly taking all oil samples for analysis.
- Conduct scheduled maintenance (quarterly and semiannual). While performing a scheduled service, mechanics should install all organizational parts that have been received for the vehicle and conduct a battalion organizational maintenance quality control inspection again to make sure that the quarterly service is acceptable and the vehicle is combat-ready.
- Perform other maintenance on the vehicle as the parts come in. A good plan to follow is to perform all the other maintenance while the vehicle is in the shop for quarterly service and then do a battalion organizational quality control inspection again.

If time permits, the last priority for organizational maintenance should be to keep the shop facilities, tools, and equipment clean; however, there should be a "clean as you go" policy. This would require only a few minutes a day to clean up the shop.

Repairing deadlined equipment at the organizational level has to be the first priority of any organizational maintenance section. However, with a good preventive maintenance program, the deadline rate will drastically decline to where it is consistently below 10 percent. If the deadline rate is over 10 percent, a good commander will have reason to believe that the unit's operator and organizational maintenance is inadequate. Contributing to maintenance deficiencies could be such conditions as a lack of trained personnel, poor maintenance management, or inadequately made repairs, which usually can be traced to the first two conditions. Other faults could include overused or high mileage equipment and insufficient time spent on maintenance.

□ Knowledge of -20 series technical manual procedures is essential in performing organizational PMCS.



Ideally, the battalion organizational maintenance quality control section should be sufficiently large and its members skilled enough to inspect all the vehicles, including trailers and auxiliary equipment—

- After scheduled services as directed by the battalion maintenance technician.

- At random as directed by the battalion maintenance technician.

- Before evacuation to and on return from direct support.

- Prior to dispatch when directed by battalion maintenance technician. (Company-level quality control personnel do all the inspections of each unit's dispatched vehicles.)

- Periodically (monthly preferred) using the -20 series technical manual PMCS standards.

- Before borrowing and returning equipment to another organization and before loaning and receiving equipment back from another organization. Field Manual 29-2 also provides guidance for the proper use of organizational-level quality control personnel.

General Bruce C. Clarke stated a theory that "an organization does well only those things a commander or manager checks or causes to be checked." At battalion and lower levels, the commander's maintenance check serves to—

- Encourage honesty and discourage false entries on DA Forms 2404 and 2406 that state equipment is much better than it actually is.

- Motivate leaders and soldiers and to let them know that the life of the vehicle depends on them during peacetime and that the life of a soldier depends on the vehicle during combat.

- Give battalion organizational maintenance quality control personnel authority and command backing.

The battalion commander must ensure that the organizational maintenance quality control personnel set the maintenance standards. Failure to do so may result in having the equipment maintenance standards set by the operator, unit commander, or a higher source than battalion. A battalion-level quality control program will enable the battalion commander to have a more accurate picture of the operational readiness of his equipment. **ALOG**

*Major Clifford B. Barkley, TXARNG, holds a Texas Army National Guard assignment as maintenance management officer. His civilian assignment is superintendent of the Texas Army National Guard Mobilization and Training Equipment Site.*

## TIME TO REVIEW AIRCRAFT REPAIR LEVELS

by Lieutenant Colonel Dennis P. Vasey

The concept of "three-level" maintenance was selected for Army aviation in 1976. Under this concept, direct support and general support maintenance were combined and more reliance was placed on depots for support. The realignment required the revision of tables of organization and equipment, maintenance manuals, shop and tool sets, and personnel training.

Since that time, the subject of just how much repair should be undertaken at the three levels—aviation unit maintenance (AVUM), aviation intermediate maintenance (AVIM), and depot repair—has been discussed considerably. Ultimately, the discussions must address the time required to complete a repair sequence, as opposed to skill availability or desire, and must decide the issue by setting bounds of maneuverability in the covering force area, main battle area, and division rear area.

Limited organic maintenance—for example cleaning, washing windshields, rotor smoothing, and minor repairs requiring from 30 minutes to 2 hours to accomplish—is the key to success during sustained operations away from established maintenance facilities. Without unit maintenance personnel, daily inspections could not be made, and malfunctioning radio or navigation equipment could not be removed and exchanged for repair at the AVIM level. The current concept of aircraft repair, which focuses on AVUM, is an integral part of technical manuals.

Repair authorizations in current maintenance allocation charts (MAC's) require urgent reconsideration for maintenance operations under combat conditions where time is a critical element. Peacetime repair performance data indicate AVUM is saturated.

During the past 30 months nearly 80 percent of my battalion's maintenance effort was expended on AVUM repairs. Maintenance personnel confirm that unit mobility is impaired when it takes one individual more than 30 minutes to make the repairs. Time is a major consideration. Anything more than visual inspection and filter replacement places severe constraints on the unit.

Maneuver elements lack the time following operational missions to accomplish all AVUM requirements listed in the MAC. In view of the speed of any enemy attack, they could not reasonably be expected to reassemble all the "bits and pieces" authorized for removal, inspection, adjustment, or repair, even though they have the personnel and equipment necessary to do the job.

Lengthy repairs below the corps AVIM level also seem futile due to the requirement for special- and general-purpose tools, materials, and diagnostic equipment. I believe that we must limit the performance of repairs in the covering force area, main battle area, and division rear area to those requiring a maximum of 1 day to complete or we must base requirements on an "intensity of conflict" index. I believe that repairs must be initiated at all levels but not at the expense of time or the MAC's as currently structured. We must plan for a contingency repair capability that will be credible without lowering established airworthiness standards or serviceability criteria.

I am a strong advocate of the "fix forward" concept and believe that onsite repairs, accomplished concurrently or independently, save equipment from further deterioration. Consequently, we must rework current repair and evacuation doctrine to ensure that we keep the maximum number of operational systems forward.

A primary concern is the need for field-expedient repairs. This need suggests that AVUM should be restructured to perform only temporary repairs that do not require the removal of structural assemblies or dynamic components, thereby limiting repair time and eliminating the use of special tools or power-generated diagnostics equipment.

Time-to-repair estimates for both AVUM and AVIM should be limited to 8 hours in the covering force area, 2 days in the main battle area, and 15 days in the division rear area. Corps AVIM should be limited to 30 days and theater AVIM should be limited to a 60-day repair time. By doing so, mission-capable rates would be the same in peace or war. Incorporation of the time element and recognition of the importance it plays in planning repair operations will take maximum advantage of the maneuverability helicopter operations permit.

At this point, we need to draw appropriate boundaries and use repair criteria that follow night, noise, and light disciplines and allow rapid maneuver while providing mission-capable aircraft at a rate consistent with the tactical situation. Revising maintenance allocation charts, revamping organizational structure, and creating simple, field-expedient repairs for AVUM units will make timely maintenance support a reality.

*Lieutenant Colonel Dennis P. Vasey is the commander of the 205th Transportation Battalion (AVIM) in U.S. Army, Europe.*

# **A LOG** DIGEST

## **LOG 2000 PLANS AIRLAND BATTLE SUPPORT**

A plan for the logistics support of the Airland Battle 2000 concept has been prepared by the Office of the Deputy Chief of Staff for Logistics (ODCSLOG).

The long-range plan, called LOG 2000, is based on analyses of the Army's concept for logistics support in the year 2000 developed by the logistics-related schools and the Army Logistics Center. The plan examines the Airland Battle 2000 concept and describes potential problems and "voids" that must be overcome as logistics support concepts evolve. It also identifies Army activities tasked to solve the problems and fill the voids.

An ODCSLOG spokesman said LOG 2000 will be updated annually, probably in January or February. *Army Logistician* will provide additional details on the plan in subsequent issues.

## **UNIT SUPPLY UPDATE PUBLISHED**

Army publications related to retail unit supply and property accountability have been gathered in an entirely new type of publication, a single bound volume expected to be distributed by 1 September.

The volume, titled "Unit Supply UPDATE," is a handbook designed to meet the needs of workers in units using the retail supply system. It contains AR's 710-2, 735-5, and 735-11, DA Pamphlet 710-2-1, and other documents, and is the first logistics-related volume to be produced under The Adjutant General's Office (TAGO) UPDATE publications program.

A TAGO spokesman said the UPDATE program applies to the Army's most widely used and distributed publications that regulate "common denominator" functions such as retail unit supply and property accountability. The single-volume format is less expensive to print and distribute than the separate regulations. It also reduces the effort required to locate and research related regulations. In addition, changes to the individual publications will be incorporated in frequent, perhaps quarterly, issues of each volume, saving thousands of man-hours by eliminating the requirement for clerks or librarians to post individual changes.

The "Reserve Components Personnel UPDATE" was the first UPDATE volume to be prepared. Subjects for additional volumes, including those related to logistics, remain to be determined, the spokesman said.

## **USAR GETS BLACK HAWKS**

The first two UH-60 Black Hawk helicopters to be issued to the U.S. Army Reserve (USAR) have been delivered. The utility helicopters went to the 376th Transportation Company, Fort Rucker, Alabama, and the 357th Transportation Company, Greencastle, Pennsylvania. The two Reserve maintenance units will use the UH-60's as maintenance float aircraft, exchanging them for Active Army UH-60's scheduled for repair.



□ Two members of the 357th Transportation Company discuss maintenance procedures for their new Black Hawk.

## **U.S. TO LEARN ISRAELI LOGISTICS LESSONS**

As part of a United States-Israel agreement to share intelligence gathered by Israel during military operations in Lebanon, the Office of the Deputy Chief of Staff for Logistics (ODCSLOG) will receive data on the logistics performance of the Israeli Army. According to an Army spokesman, the data should be particularly valuable because much of the materiel used by Israel was furnished by the United States.

Information Israel will provide ODCSLOG will include—

- A description of the repair parts supply system used in Lebanon.
- A comparison of repair parts consumption in combat and peacetime, by category of equipment.
- The amounts of repair parts use attributable to mechanical failure and combat damage.
- A list of parts used to repair U.S.-furnished equipment, including the quantity of each part consumed and data on how well the parts performed.

- Descriptions of the Israeli distribution systems for ammunition, potable water, and petroleum, oils, and lubricants.

The ODCSLOG will share the logistics information with other Army elements as security considerations permit.

## HIGH TECH TEST BED REDESIGNATED

The High Technology Test Bed, located with the 9th Infantry Division at Fort Lewis, Washington, has been redesignated the Army Development and Employment Agency (ADEA).

The ADEA is a field operating agency of the Department of the Army under the command of the 9th Infantry Division commander. Like its predecessor, the ADEA is responsible for developing and fielding a prototype light division by 1986 and serving as the test bed for new equipment developed or purchased for the light division.

The agency will coordinate operational, doctrinal, training, and organizational concepts with the Army Training and Doctrine Command and materiel requirements with the Army Materiel Development and Readiness Command.

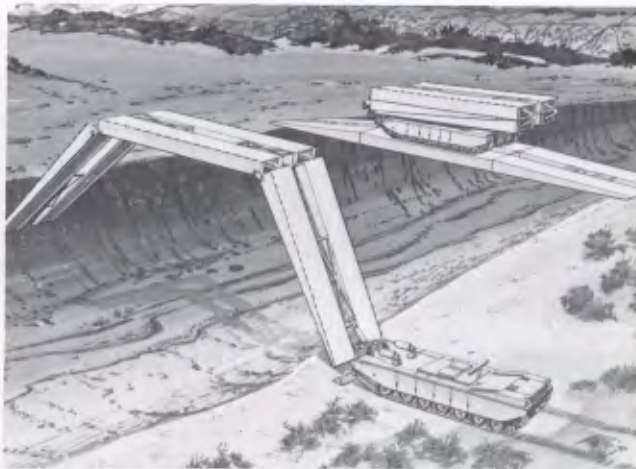
## ARMY IMPROVES INVENTORY ACCOUNTING

The Army has implemented a change to the commodity command standard system (CCSS) that will improve visibility of reversals to physical inventory adjustments and give the Army better data on the accuracy of the Army Materiel Development and Readiness Command's (DARCOM's) inventory records.

Physical inventory adjustments are actions required to reconcile discrepancies in inventory records. When research indicates that a discrepancy was caused by an earlier erroneous transaction, the adjustment can be reversed and eliminated from the Army's statistics on adjustments. The General Accounting Office has urged that the armed services improve visibility of reversals to obtain more accurate data on the true scope of inventory adjustments.

The CCSS change will provide DARCOM with quarterly reports on reversals at all DARCOM depots and materiel readiness commands. The reports will tally reversals, net adjustments, and the total of adjustments made prior to any reversals. The reports will also identify the dollar value of adjustments according to the error-cause codes by which they were listed. Accurate data on error-cause codes will permit the Army to concentrate its inventory research efforts on those areas causing the most problems.

In a related action, DARCOM has instructed each depot to appoint a movement control officer to assure that items are not relocated unnecessarily during inventory. Frequent relocation of materiel within depot warehouses has created difficulties in locating and counting materiel when taking inventory. To aid in maintaining accurate location records, remote computer terminals are being installed in high-activity warehouse areas so that location changes can be promptly recorded.



□ The Army Mobility Equipment Research and Development Command has awarded a \$4.82 million contract to Bowen-McLaughlin-York for design and fabrication of a prototype heavy assault bridge (shown above in artist's rendering). The bridge will be a 100-foot span, military load class 70, with a double-fold, scissors design. It will mount on an M1 tank chassis. If accepted, the bridge will replace the armored vehicle launched bridge now in use. Delivery of the prototype is scheduled for March 1986.

## IMPROVEMENTS IN PACKAGED POL SOUGHT

The Office of the Deputy Chief of Staff for Logistics has drafted an action plan for improving management of packaged petroleum, oils, and lubricants (POL). The plan encompasses initiatives and studies in doctrine, packaging, equipment specifications, research and development, procurement, and war reserves.

Actions already underway include adopting commercial packaging standards for engine oils used in continental United States operating stocks and increasing stocks of packaged POL supplies in war reserves. Studies under the action plan cover such subjects as possible Army use of commercial markings, changes in container sizes, and revisions of operating doctrine.



□ Interservice support saved the Air Force approximately \$1 million during a recent transfer of OA37 jet aircraft from McClellan Air Force Base, California, to 5th Air Force, Yokota Air Force Base, Japan. The Military Sealift Command shipped the 11 aircraft between Military Traffic Management Command (MTMC) terminals. In the photograph above, one of the OA37's, still in its protective "cocoon," is lowered to the dock at the MTMC Terminal, Yokohama, Japan.

## TWO CONUS ARMIES TO BE ACTIVATED

Two additional Army headquarters in the continental United States (CONUS) will be activated under the recently approved reorganization of the Army Reserve command structure. They will assume responsibility for the Reserve training and mobilization planning functions currently performed by the Army readiness and mobilization regions. The nine regions will be phased out during the next 2 years.

The headquarters of the 2d U.S. Army will be at Fort Gillem, Georgia, and the headquarters of the 4th U.S. Army will be at Fort Sheridan, Illinois. They will be activated in fiscal years 1984 and 1985, respectively. The Army will also establish two small forward elements to help supervise training and planning in the large geographic areas covered by the existing 1st and 6th U.S. Armies. The elements will be Headquarters,

1st Army Forward, Fort Devens, Massachusetts, and Headquarters, 6th Army Forward, Fort Douglas, Utah.

An Army spokesman says the reorganization will reduce the number of layers in the Reserve command structure while maintaining a manageable span of control for each CONUS army. The Army expects to save \$5.5 million a year in operating costs under the new structure.

## HOST NATION SUPPORT FUNDS SOUGHT

To avoid delays in implementing the Wartime Host Nation Support Agreement between the United States and the Federal Republic of Germany, Secretary of Defense Caspar W. Weinberger has requested a supplemental appropriation of \$9.67 million to pay the U.S. share of fiscal year 1983 costs.

In a statement before the House Appropriations Defense Subcommittee, the Secretary stressed the critical need for the wartime logistics support the Germans will provide under the agreement. He also pointed out that providing a similar capability in the U.S. Reserve components would be 10 times as expensive and in the Active units, 40 times as expensive.

The agreement calls for West Germany to create new units in the Bundeswehr Reserve (approximately 93,000 men). Upon mobilization, these units would be dedicated to supporting U.S. Army and Air Force combat units deployed forward in Europe and those coming in as reinforcements. Support duties include U.S. installation security, airfield damage repair, materiel and fuel transport and handling, casualty evacuation, prisoner of war management, and nuclear-biological-chemical decontamination.

The Wartime Host Nation Support Agreement is Germany's principal contribution to NATO's long-term defense program adopted in 1978. The program called for increased allied support in return for the U.S. commitment to provide a 10-division D-Day reinforcement of Europe.

## MICOM RESHAPES FOREIGN MILITARY SALES PROGRAM

Recent productivity increases have enabled the Army Missile Command (MICOM), Redstone Arsenal, Alabama, to improve the management of its foreign military sales program and reduce its backlog of cases.

Before the productivity improvement program began in April 1982, MICOM required approximately 100 days to fill foreign military sales orders, 60 percent of which were behind deadline. One year later, MICOM had reduced its caseload to 29, with only 10 percent

behind deadline. The average time now required to fill orders is below the goal of 53 days.

The productivity improvements undertaken by MICOM include greater use of overhire personnel to obtain additional work-years of labor while holding down personnel costs; organization of the international logistics directorate by weapon systems rather than geographic areas to improve communication with other MICOM components; and use of an automated system to track the procedural milestones for each foreign military sales case.

## TAEDP IMPROVED

The total Army equipment distribution program (TAEDP) has been modified to provide more timely data for use in validating major item requisitions.

As improved, the TAEDP now extracts asset data from the continuing balance system-expanded and requirements data from the Army authorization document system and provides monthly, up-to-date requisition validation listings. Previously, these listings were reported quarterly and reflected data as much as 9 months old.

An Army spokesman says the improved TAEDP reports are expected to result in fewer rejected requisitions and, in general, to unclog supply management information systems. An in-depth description of the TAEDP, its uses, and planned improvements may be found in the article on pages 2 through 5 of the July-August issue of *Army Logistician*.

## WHOLESALE INVENTORY ADJUSTMENTS CUT

Better control over inventory accounting by Army managers at depots and materiel readiness commands reduced the amount of gross wholesale inventory adjustments by 12.6 percent during fiscal year 1982. The adjustments are actions required to reconcile discrepancies in inventory records.

The reductions resulted from management improvements instituted by the Army Materiel Development and Readiness Command. The improvements include analyzing quarterly reports to discover the most common reasons for adjustments; conducting more research into transactions before making adjustments; placing greater emphasis on maintaining accurate inventory records; and reversing original transactions when possible instead of making inventory adjustments.

Fiscal year 1982 adjustments amounted to \$791 million, compared to \$905 million in 1981.



□ A portable shelter that provides covered work space for helicopter maintenance and repair in forward areas (shown above) is being tested by the Army. The Army Natick Research and Development Laboratories developed the shelter, known as the transportable helicopter enclosure. It offers a barrier-free space that can be erected quickly in the field and used in all climates. With dimensions of 84 feet long, 26 feet wide, and 20 feet high, it can accommodate attack, utility, and scout helicopters for servicing. Constructed of opaque, lightweight urethane material, the shelter is supported by air pumped into large arch-shaped beams in its walls. Eight men can erect or dismantle it in 2 hours. The Army expects to begin fielding the shelter in 1987.

## R.O.K. SUPPORT TO U.S. FORCES SAVES

Support provided by the Republic of Korea (R.O.K.) to U.S. Forces, Korea, under the combined defense improvement projects program is improving peacetime readiness and the quality of life for U.S. soldiers. The program, described by an Army spokesman as one of the most successful allied cooperative programs, is also saving money.

More than 50 improvement projects are now underway. Key logistics functions performed by civilians working for the Korean Service Corps include handling, storing, and managing petroleum; receiving, storing, and issuing conventional ammunition; overhauling selected equipment; transporting materiel by highway; and operating terminals. Korean efforts to improve the quality of life for U.S. service members include offering reduced travel rates for dependents visiting in Korea and lower prices for gasoline, electricity, and rent.

According to the spokesman, the program saves the Army approximately \$900 million annually. **ALOG**



## RECENTLY PUBLISHED

- AR 11-39**, Army Command and Control System, 1 July 1983.
- AR 55-71**, Transportation of Personal Property and Related Services, 1 June 1983.
- AR 210-11**, Billeting Operations, 15 June 1983.
- AR 210-51**, Army Housing Referral Service Program, 1 July 1983.
- AR 700-70**, Application of Specifications, Standards, and Related Documents in the Acquisition Process, 15 May 1983.
- AR 700-84**, Issue and Sale of Personal Clothing, 15 May 1983.
- AR 700-84, Interim Change 1**, Issue and Sale of Personal Clothing, 9 June 1983.
- AR 700-127**, Integrated Logistics Support, 15 June 1983.
- AR 725-50, C4**, Requisitioning, Receipt, and Issue System, 1 April 1983.
- AR 725-50, Interim Change 1**, Requisitioning, Receipt, and Issue System, 12 May 1983.
- FM 10-70**, Inspecting and Testing Petroleum Products, 9 May 1983.
- FM 29-47**, Main Supply and Service Company, Forward Supply and Service Detachments, Supply and Service Battalion, Airborne Division, 29 March 1983.
- TRADOC Pam 525-22**, U.S. Army Operational Concept for Medical Support Operations in a Chemical Environment, 31 January 1983.
- TRADOC Pam 525-25**, U.S. Army Operational Concept for Wartime Personnel Replacement Operations, 21 February 1983.
- TRADOC Pam 525-27-1**, U.S. Army Operational Concept for Forward Support Maintenance, 21 May 1983.
- TRADOC Pam 525-30**, U.S. Army Operational Concept for Rear Area Protection, 31 May 1983.
- TRADOC Pam 525-31**, U.S. Army Operational Concept for Civil Affairs, 10 June 1983.
- DOD Directive 7420.13**, Stock Fund Operations, 27 January 1983.
- DOD Instruction 2010.10, C1**, Mutual Logistic Support Between the United States and Other NATO Forces, Financial Policy, 8 February 1983.
- DOD Instruction 4140.51**, Exchange of Nonexcess Personal Property in the Department of Defense, 2 March 1983.
- DOD Instruction 4245.3**, Design to Cost, 6 April 1983.
- DOD Instruction 5000.2**, Major System Acquisition Procedures, 8 March 1983.
- DOD Instruction 7000.3**, Selected Acquisition Reports, 2 March 1983.

*NOTE—The date listed after the publication title is the date of technical edit. Printing and distribution usually occur several months after this date.*

### SUPPLY CAREER REG REVISED

Civilian Personnel Regulation (CPR) 950-13, Civilian Career Program for Supply Management, has been completely revised and published as AR 690-950-13.

The regulation explains the intake and career management of employees in grades GS-5 and above in occupational series 2001, 2003, 2010, 2030, 2050, 346 (when supply management is the predominant job element), and any other series related to supply. It also applies to selected GS-4 employees in the GS-301 series.

The Army is converting all CPR's to AR's.

### ILS POLICY SET

Integrated logistics support (ILS) is the subject of the recently published AR 700-127. The revised regulation provides improved ILS policies and procedures, including requirements for supporting systems being displaced by new or improved systems.

### LOTS REGULATION UPDATED

Revised AR 55-176, Logistics Over the Shore Operations in Oversea Areas, updates procedures for conducting logistics-over-the-shore (LOTS) operations and defines the responsibilities of each armed service in supporting joint operations.

A LOTS operation supports an amphibious assault or a base established following an amphibious assault.





## CAREER PROGRAMS

### MANAGEMENT PLAN MAINTAINS MECHANICS

An enlisted distribution plan has been implemented to reduce specialty imbalances in career management field (CMF) 63, mechanical maintenance. A shortage of mechanics in 9 of the 28 CMF 63 specialties, primarily those related to the new weapons entering the inventory under the force modernization program, caused the imbalances.

Under the plan, the Military Personnel Center (MILPERCEN) determines the fair share of mechanics for each major command based on projected personnel inventories and worldwide requirements. In turn, the major commands allocate the mechanics down to the installation or requisitioning activity level and report the distribution to MILPERCEN. The Center tracks the data and manages assignments through the automated centralized assignment procedure (CAP III).

A MILPERCEN official says the enlisted distribution plan is a short-term solution to the problem of imbalanced specialties. Long-term actions planned to correct the mechanic shortage include increased recruiting and training and improved promotion opportunities.

### CS AND CSS MANNING CONCEPT APPROVED

The Chief of Staff has approved a general concept to extend the benefits of the new manning system to combat support (CS) and combat service support (CSS) branches.

As designed for the combat arms,

the new manning system features stabilization and cohesion through a COHORT (cohesion, operational readiness, and training) unit replacement system and soldier affiliation with a combat arms regiment through the regimental system. However, analysis of the CS and CSS force structure revealed that—

- Stabilizing soldiers through unit movements such as the COHORT system is not feasible for widespread CS and CSS applications.

- Defining regiments as groupings of organizationally similar units based in CONUS and overseas is not feasible in the support branches.

As a result of the analysis, the application of the new manning system to CS and CSS soldiers will focus soldier affiliation with branch- or sub-branch-oriented regiments based on functional skills or geographical locations. Where feasible, unit movement such as the COHORT system will be practiced.

Specific plans for the evolving CS and CSS manning system will be developed on a decentralized, branch-by-branch basis using guidelines being developed by the Department of the Army, an Army spokesman said.

### MATERIEL ACQUISITION MANAGERS COURSE COMING

The first class of the 9-week Materiel Acquisition Management (MAM) Basic Course is scheduled to be presented at the Army Logistics Management Center (ALMC) from 17 October to 16 December. Five more classes are scheduled in

fiscal year 1984, one in the second quarter and two each in the third and fourth quarters.

The course is designed to prepare military officers and civilian personnel for mid-level management positions. Subjects to be presented include identifying requirements; developing and testing concepts and hardware; and purchasing, fielding, sustaining, and disposing of materiel.

For additional information write to—Commandant, ALMC, ATTN: DRXMC-ACM, Fort Lee, VA 23801.

### COLONELS CONSIDERED FOR CSS COMMANDS

Colonels and promotable lieutenant colonels will be considered for colonel-level commands by a combat service support board scheduled to meet 27 September to 21 October.

The board will select commanders for depots, arsenals, proving grounds, terminals, logistics troop commands, laboratories, commissary commands, Army and Air Force Exchange Service regions, contracting commands, and personnel commands.

Eligible for consideration are officers who hold specialties 42, 51, 71, 72, 73, 74, 75, 81, 82, 91, 92, 95, or 97; have less than 26 years of active commissioned service as of 1 October 1984; and have not commanded at the colonel level.

Officers in the zone of consideration may submit letters commenting on their records to—President, FY 85 Colonel Command Selection Board (Combat Service Support), ATTN: DAPC-MSB, 200 Stovall Street, Alexandria, VA 22332.

Officers may inquire about their eligibility or may decline consideration by writing to—U.S. Army Military Personnel Center, ATTN: DAPC-OPC-P, 200 Stovall Street, Alexandria, VA 22332. **ALOG**



## EMPHASIS

*(Continued from page 1)*

### **CONSULT SYSTEMS CLEARINGHOUSE**

Current or potential users of minor automated logistics systems must consult the Army's automated logistics systems clearinghouse before starting work on a new system. They can contact the clearinghouse by writing to—Commander, U.S. Army Computer Systems Command, ATTN: USACSC-TEA-R (Mr. Jerzak), Fort Belvoir, VA 22060, or calling AUTOVON 354-1652. The clearinghouse has data on approximately 350 existing systems.

### **WATER TEST KIT COMING**

The Army plans to field its new M272 water testing kit by the end of this year, 2 years ahead of schedule. The compact, lightweight kit is designed for use by soldiers operating in arid or possibly contaminated environments. It contains materials for quickly detecting chemical and biological warfare agents in raw and treated water. Development of the kit ahead of schedule will save the Army approximately \$2 million.

### **TOE UNITS SET FOR KOREA POL**

General support of petroleum, oils, and lubricants (POL) in 8th U.S. Army will shift from a tables of distribution and allowances (TDA) activity to tables of organization and equipment (TOE) units under a plan recently approved by the Army. Establishment of TOE units is designed to provide better organization for rapid expansion in wartime without increasing the number of peacetime personnel. The TOE units are scheduled for activation by May 1984. The TDA activity they will replace is the Petroleum Distribution System-Korea, headquartered at Taegu, South Korea.

### **NEW HHG RULES**

Married soldiers transferring to the Federal Republic of Germany will no longer need to ship their weight allowances of personally owned household goods (HHG) as part of their moves. The reversal of a policy adopted in October 1981 resulted from an Army study that concluded it was less expensive to provide Government furniture support than to continue requiring shipments of personal household goods. The new policy will be implemented gradually as furniture stocks become available.

### **INSIDE TRUCK MIRRORS OUT**

Unserviceable inside rearview mirrors in M880 and M890 series vehicles will no longer be replaced. The trucks' inside rear view is frequently blocked by canvas tops or other equipment, but because the trucks have two outside mirrors, they meet the Federal safety standard requiring two rearview mirrors, one inside and one outside or two outside. The new policy was announced in SMART Message 28.

**AMMO REVIEWS  
SAVE MONEY**

Reviews conducted under the Army's ammunition logistics support and review program during fiscal year 1982 resulted in cost savings and avoidances of \$7 million, for a total of \$141 million since 1976. Under the program, teams from the Army Defense Ammunition Center and School make independent assessments of Army activities involved in ammunition logistics, identify specific problems and recommend solutions, and compile data on ammunition resources and capabilities. The teams have conducted 37 reviews and 7 technical assistance visits since the program began 7 years ago.

**ILS NEWSLETTER  
PUBLISHED**

The Army Materiel Development and Readiness Command's Materiel Readiness Support Activity has published the first quarterly Integrated Logistics Support (ILS) Newsletter. Articles in the newsletter cover subjects such as special studies, new concepts and initiatives, and publications updates. The newsletter is distributed to all Army ILS and force modernization offices. Requests for copies may be addressed to — U.S. Army DARCOM Materiel Readiness Support Activity, ATTN: DRXMD-EI, Lexington, KY 40511, or call AUTOVON 745-3340.

**AMMO  
PACKAGING  
STUDIES LISTED**

A bibliography of studies titled "Ammunition Production and Packaging" and a bibliography of operations research models titled "Ammunition Production" are available to authorized persons. Write DLSIE, ALMC, Fort Lee, VA 23801, or call AUTOVON 687-4655 or commercial (804) 734-4655.

**SHOE BARGAINS  
OFFERED**

The Army and Air Force Exchange Service is now offering selected brands of commercially available athletic shoes at discount prices to promote the physical fitness of soldiers. The shoes include six brands for men and four for women and are priced from \$11 to \$38. Exchanges at basic training centers and selected installations worldwide will sell the shoes, which will not be stocked in military clothing sales stores.

**CONTRACTOR  
AWARDS REVISED**

Changes in the Department of Defense (DOD) contractor assessment program have broadened the eligibility criteria to include more firms and simplify evaluation procedures. Evaluations under the program, now called the Defense quality excellence award program, will be performed jointly by the appropriate procurement office, program manager, and quality assurance representative. The quality assurance representative previously made evaluations. The program is designed to recognize DOD contractors who consistently produce high quality materiel.

**CHEMICAL GARB  
CAN BE REUSED**

Under a recent policy change, Army units overseas are no longer required to turn in used chemical protective overgarments to property disposal offices for destruction. Now, after turn-in, they can be redrawn for uses other than chemical protection. The policy change does not affect continental United States units, which were already permitted to withdraw used chemical garments. The Office of the Deputy Chief of Staff for Logistics recommends that Army units reuse the garments as clothing for soldiers working in motor pools and other areas that would damage personal clothing.

**ARMY STUDIES  
VEHICLE LIFE**

The first interim report in the Army's 3-year study of the economic life of its tactical wheeled vehicles is scheduled for delivery to the Congress next March. The study, requested by the House Armed Services Committee, is designed to collect data on vehicle use and develop criteria for determining the useful life of the various types of tactical wheeled vehicles. Use data is being collected from selected units in the Army Forces Command and U.S. Army, Europe. The second interim report to the Congress is scheduled for March 1985, with a final report due in April 1986.

**ADDED POMCUS  
REQUESTED**

Secretary of Defense Caspar W. Weinberger has urged the Congress to lift the prohibition on additional pre-positioning of materiel configured to unit sets (POMCUS) in Europe and requested a fiscal year 1983 supplemental appropriation of \$5 million to implement POMCUS for division sets 5 and 6. He described the program as "the only feasible way to meet our 10-division D-Day commitment," and cited Belgium and the Netherlands for their efforts in acquiring land for the storage facilities and all NATO allies in providing construction funds.

**FIVE ENTER  
ORDNANCE HALL**

Five individuals were recently inducted into the Ordnance Hall of Fame as part of the Ordnance Corps' 171st anniversary celebration. They are Lieutenant General Harold F. Hardin, Jr., USA (Ret.); Major General J. Frederick Thorlin, USA (Ret.); the late Brigadier General John W. Coffey, USA; Mr. Clifford D. Bradley; and Mr. James M. Hait. The Hall of Fame, located at the Army Ordnance Museum, Aberdeen Proving Ground, Maryland, now has 90 members.

**CBS-X NUMBER  
CHANGED**

If you've been trying to call the Depot System Command about the continuing balance system-expanded (CBS-X) information contained in the *Army Logistician* article (page 34, July-August issue) and couldn't get them, here's why: the AUTOVON prefix for Letterkenny Army Depot has just been changed to AUTOVON 238 plus the extensions. Numbers now are AUTOVON 238-7966 or -6521, -6526, or -6511. After duty hours call AUTOVON 238-7848 or -7830.

**RED ID NOW  
MEAL CARD**

Reserve component personnel on inactive duty training or active duty for training must now present their red identification cards to eat at Reserve component dining facilities. When they eat at Active Army facilities, they will be temporarily issued the DD Form 714 meal card. Adoption of the red card as a meal card is designed to reduce paperwork while controlling access to Government meals. Use of the card will be reviewed this Summer for possible modification.

**CH47D SUPPORT  
SUCCESS CITED**

Logistics support for the recent introduction of the improved Chinook (CH47D) helicopter at Fort Campbell, Kentucky, was "a tremendous success," according to an official in the Office of the Deputy Chief of Staff for Logistics. Every tool and item of special equipment required for CH47D aviation unit maintenance and intermediate maintenance were on hand before the first aircraft arrived. In addition, all manuals, in skill performance aids format, were onsite, and more than 98 percent of the 5,050 CH47D-specific spares had national stock numbers assigned.

# Motivation

by Dennis E. Campbell

**T**he most critical member of any logistics team is the frontline manager—the one “in the trenches” with the troops, where the action is. The question most frequently asked by supervisors of logistics personnel is, “Are there any methods or rules to achieve organizational success through the efforts of others?” Successful managers and leaders agree there is no one “best” style or approach, except to create a good working environment.

In this and the next two issues of *Army Logistician*, I would like to share with you my thoughts on motivation, leadership, and interpersonal communications. These thoughts are offered not as a formula, good for all occasions, but as options designed to help improve the logistician’s chance for success through the efforts of others.

First, let’s look at motivation. Effective techniques for motivating people are built upon honest, straightforward strategies that are people-oriented. Although each person has similar needs, wants, and desires, individual differences set us apart from each other. These differences are the key to individual motivation. These differences can be applied to work groups, also. The techniques presented below have worked well for me.

**Capitalize** on group power, skills, and abilities. Direct group efforts toward organizational goals. Reinforce contributions by strengthening the cohesive bond. Teams foster mutual responsibility, and teamwork is the cohesive bond of a successful unit.

**Create** a work environment that allows individuals to meet their goals. Goal blockage results in frustration and that frustration is labeled “lack of motivation” or “bad attitudes.” Satisfaction of needs occurs through motivation.

**Establish** a group identity. Identification with a group is important. Security, esteem, affiliation, and self-fulfillment attract people to groups. Group status, norms, pressure, success, and values help to keep members. The adage “Birds of a feather flock together” represents this principle.

**Help** personnel to achieve job satisfaction. Opportunities for advancement are important. People want to

identify with quality organizations and people. Achievers value job satisfaction and supervisors who sympathetically help them to achieve.

**Improve** skill levels. Make use of job rotation, enrichment, and enhancement techniques. Formal and informal training raises ability levels. Team low performers with high performers. Coach individuals and groups on how to achieve goals. Keep proficiency current and updated.

**Offer** recognition and rewards. Reinforce good performance. People want to be told they do good work. Recognition builds confidence, and confidence causes a person to perform well and increase job satisfaction. Feedback is absolutely necessary.

**Organize** jobs to relate effort to end products. Broaden responsibilities; enlist individual inspection and quality assurance skills. Use a team concept for completion of tasks. Design and redesign jobs to maximize application of skills, abilities, and performances.

**Treat** your people as whole persons. Aid motivation by recognizing a person’s characteristics. Perception is the framework of a person’s behavior. Values, attitudes, and personality influence behavior. Develop a better person, not better elements of a person.

**Use** threats and fear sparingly. Use punishment only when necessary. “Fair but firm” should be the rule. Threats and dominance kill creativity and initiative. Anxiety and frustration end in dissatisfaction.

A motivated team accounts in large measure for the success that a leader or manager achieves. Look at your own organization and see how you are applying these techniques. Greater use of the techniques could mean greater success for you.

**ALOG**

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## Coming in Future Issues—

- **LOG 2000**
- **NBC's of Logistics**
- **Modeling the Wholesale Logistics Base**
- **Logistics Research and Development Program**
- **German Army Logistics**
- **TORCH—Unlearned Logistics Lessons**
- **Criminal Investigation—a Combat Multiplier**
- **Expanding the Line**
- **Managing Aviation Maintenance by Microcomputer**
- **Case for Airdrop**
- **Flight Without Wings**
- **DARCOM Direction—a New Way**
- **Round Pegs Don't Fit Square Holes**
- **ETO Experience—Lessons Learned**
- **Buying Beef in Europe**
- **Containerized Cargo Management**
- **On the Road to HMMWV**