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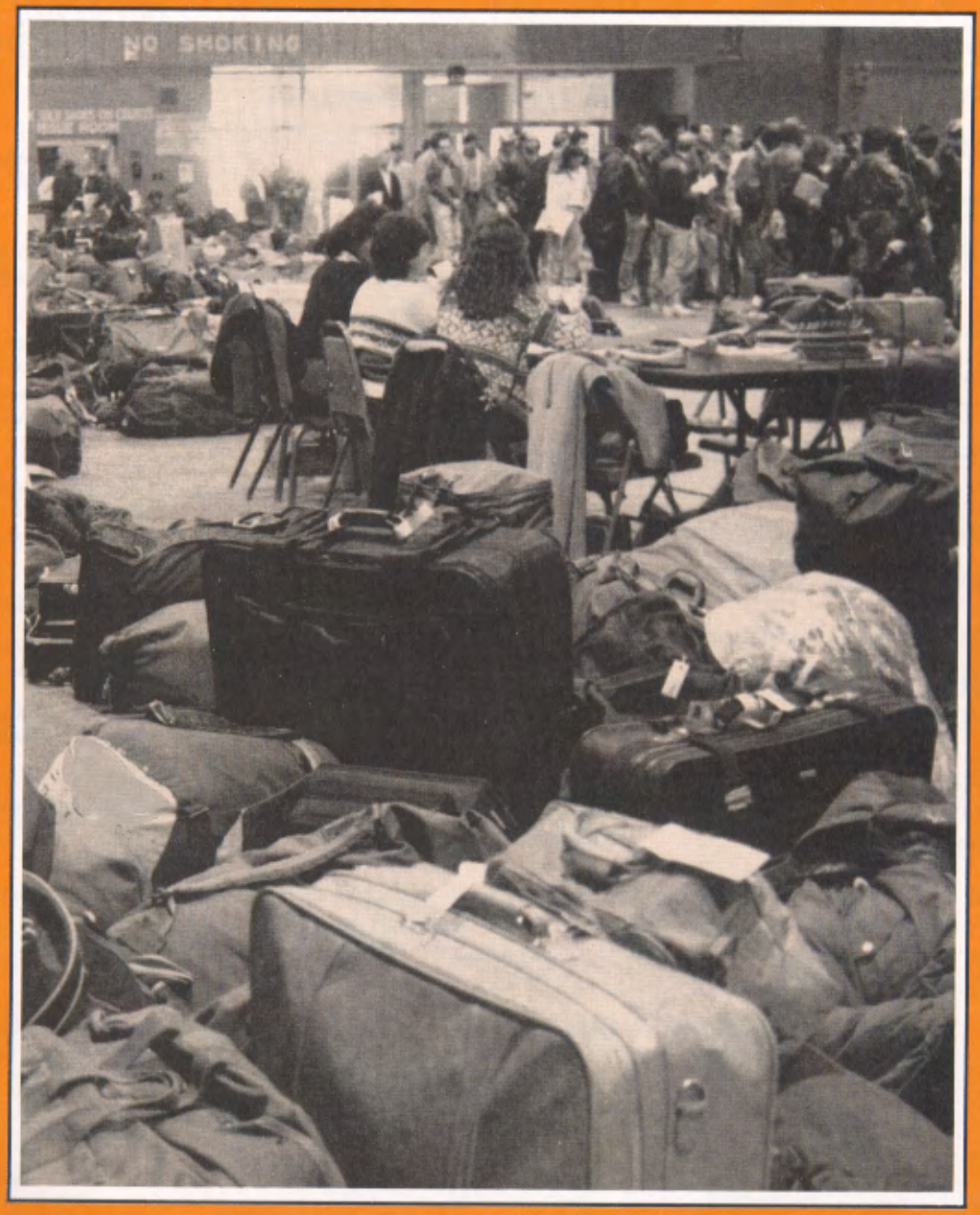
MAY-JUNE 1991



Mobilizing Ready Reservists

PB 700-91-3, Headquarters, Department of the Army

ARMY LOGISTICIAN

PROFESSIONAL BULLETIN OF UNITED STATES ARMY LOGISTICS

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MAY-JUNE 1991

ARTICLES

DEPARTMENTS

COVER—Approximately 20,000 individual ready reservists were ordered to active duty in January to support Operation Desert Storm. A story describing in-processing activities at Fort Lee, Virginia, one of several mobilization sites, begins on page 22.

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ALOG EMPHASIS

DESERT STORM SUBSIDES

Technologically reliable weapon systems, brilliant strategy, textbook tactics, and an expertly trained and ready force combined to decisively defeat the world's fourth largest military force. United States-led coalition forces, outnumbered by a reported 2 to 1, overwhelmed Iraqi forces, successfully concluding a 4-day ground campaign on 27 February. President George Bush, announcing the victory, said, "Kuwait is liberated. Iraq's army is defeated. Our military objectives are met." In the internationally televised address, he paid high tribute to all elements of the coalition in the prosecution of the war.

General H. Norman Schwarzkopf, coalition commander, gave an in-depth press briefing on the strategy and tactics employed in the ground campaign, during which he cited the unparalleled logistics support operations:

". . . I can't recall any time in the annals of military history when this number of forces have moved over this distance to put themselves in a position to be able to attack.

"But what's more important—and I think it's very, very important that I make this point—and that's these [pointing to detailed charts] logistics bases. Not only did we move the troops out there, but we literally moved thousands and thousands of tons of fuel, of ammunition, of spare parts, of water and of food, out here into this area, because we wanted to have enough supplies on hand so that if we launched this and if we got into a slugfest battle, which we very easily could have gotten into, we'd have enough supplies to last for 60 days.

"So it was an absolutely gigantic accomplishment, and I can't give credit enough to the logisticians and the transporters who were able to pull this off. . . ."

Now that Desert Storm has subsided, logisticians and sustainers face the formidable tasks of structuring the redeployments, retrograding materiel and equipment, and establishing the sustaining base for those who will secure the peace.

CHANCELLOR LAUDS LOGISTICS

John Chancellor, noted television commentator, cited logistics as the key to the success of the Gulf War, in his NBC Nightly News broadcast of 6 March 1991. Chancellor said in his commentary—

"Before the memories of this war get blurred in the songs of old soldiers, there's a point to be made about how it was won. Everybody who fought the war shares in the victory: the air crews and the ground troops from many countries.

"But what I heard from a lot of people out there is that this was a 'logistician's war,' that logistics—the movement of troops and supplies—made all the difference.

"Here's an example: Logistics made possible the greatest military deception since World War II. One hundred and fifty thousand troops of the VII and XVIII Corps in Saudi Arabia were shifted in secret 150 miles to the west. That is the equivalent of moving the entire population of Flint, Michigan, to Toledo, Ohio. Logistics did it. Another example: the 101st Airborne traveled more than 250 miles across Iraq, and the trucks that kept it running and fighting were up there all the time. Logistics did it. These troops helped keep the Republican Guards from escaping to Iraq. It was logistics that gave them the gas and ammunition to do the job.

"In a press interview, General Schwarzkopf said he told his commanders [before the fighting began], and I quote, 'You [are] going to go—swoosh—way the hell out there and all your supplies are going to go out there . . . and I'm sure they thought Schwarzkopf's lost his mind.' He hadn't. That's how victory was achieved with such speed, with all the supplies going—swoosh—out there, for an army that didn't have to hestitate for a moment as it won the war. Logistics did it."

So said John Chancellor.

(Transcript of John Chancellor's commentary from NBC Nightly News *© 6 March 1991, courtesy of the National Broadcasting Company, Inc. All Rights Reserved.)*

(Editor's note: Hostilities ceased in Operation Desert Storm as this issue went to press. Many articles in this issue reflect then-ongoing operations.)

(Continued on page 45)

Total Asset Visibility

by Timothy Yeager and Alan F. Estevez

A number of recent newspaper articles have asserted that the Army was having trouble keeping track of its spare parts while moving equipment to Saudi Arabia for Operation Desert Storm. According to these reports, the problem was caused in part by the lack of a good central inventory system. The lack of a comprehensive central inventory, or asset visibility, system was not news to the Department of the Army. In fact, in 1989 the Army's Strategic Logistics Systems Task Force, a group of logistics experts assembled to analyze Army logistics for the year 2010 and beyond, had reiterated that "vastly increased asset visibility" was key to developing an integrated logistics system over the long term.

In 1990, the Department of Defense (DOD) announced its Defense Management Review decisions (DMRD's). These decisions are designed to produce near-term savings by consolidating similar functions among the military services. Many of the DMRD's identify asset visibility as a significant element in achieving DOD's short-term logistics objectives. For example, DMRD 901 cites "visibility of retail and operating stocks" as a means of reducing Army supply system costs; DMRD 927 mandates that wholesale and retail logistics be integrated, which will require increased visibility of the Army's inventory. The message is clear: The Army needs asset visibility!

Actually, the Army already has asset visibility, but it is fragmented and limited in scope. As outlined in AR 710-3, Asset Transaction Reporting System, the Army has several management information systems that maintain visibility over a majority of the Army's inventory. For example, the continuing balance system-expanded (CBS-X) maintains visibility of all major end items (supply class VII) with reportable item control code 2; the selected items management system-expanded provides visibility of selected repair parts (class IX); and the worldwide ammunition reporting system captures visibility of all ammunition (class V). A variety of systems, such as the DOD small arms serialization program and DOD radiation testing and tracking system, provide serial number visibility of selected items within the Army inventory. Lastly, the commodity command standard system (CCSS) is a repository of wholesale asset data, although this information is compartmentalized by functional area.

What the Army does not currently possess is a single, authoritative source for tracking its total inventory. A user must query several different systems in order to determine onhand balances for all of the items that make up one weapon system. In short, the Army's picture of asset visibility is highly disjointed.

In July 1990, the Strategic Logistics Systems Task Force became the Strategic Logistics Agency (SLA), which then assumed responsibility for implementing several of the DMRD's. Recognizing the need for better asset visibility, SLA is developing total asset visibility processes and capabilities that will ultimately provide near-real-time visibility of the Army's inventory from factory to foxhole. The criteria for developing such a program are clear: Achieve the savings mandated by the DMRD's to realize maximum near-term paybacks while at the same time minimizing risks in the developmental process.

To meet these goals, both existing and emerging processes and capabilities are being used to obtain visibility of Army assets, whether they are in the hands of soldiers; in storage at a retail stockage point, depot, or wholesale stockage point; or moving between their source and destination. In order to minimize risks, total asset visibility is being developed and evaluated using total quality management principles, including a proof-of-principle demonstration and rapid prototyping techniques.

It is anticipated that total asset visibility will generate tremendous savings for the Army by supporting other SLA initiatives, such as readiness-based maintenance and stock funding of depot-level reparables, as well as the existing requirements determination process. Savings can also be achieved by streamlining current Army inventory control procedures. Ultimately, total asset visibility will evolve as an interactive network that provides Army managers and decisionmakers with the capability to manage and control assets in response to national needs.

The Army currently manages class VII items more effectively than any other class of supply. Under the centralized management of class VII, major end items are tied precisely to the Army force structure through the interface between the requisition validation system and CBS-X. The key class VII management system, CBS-X, currently interfaces with 18 of the 24 existing retail and wholesale supply systems that maintain supply transactions or asset information. The SLA concept for total asset visibility builds on the principles already successfully demonstrated in class VII management. It extends those principles to the other classes of supply, links asset data to a commonly defined Army force structure, and makes it possible to synchronize data in a building-block approach.

By using the class VII centralized information management processes, total asset visibility will extract transactions from existing supply systems to track assets by weapon system. Data sources and collection for the total asset visibility data base will not be readily apparent to the user (being "transparent") and will not create additional reporting requirements. While SLA's total asset visibility concept proposes to build on this class VII management foundation, it goes one step farther by supplementing the centrally managed data base with decentralized technology that can "reach through" other Army automated logistics systems to capture additional data.

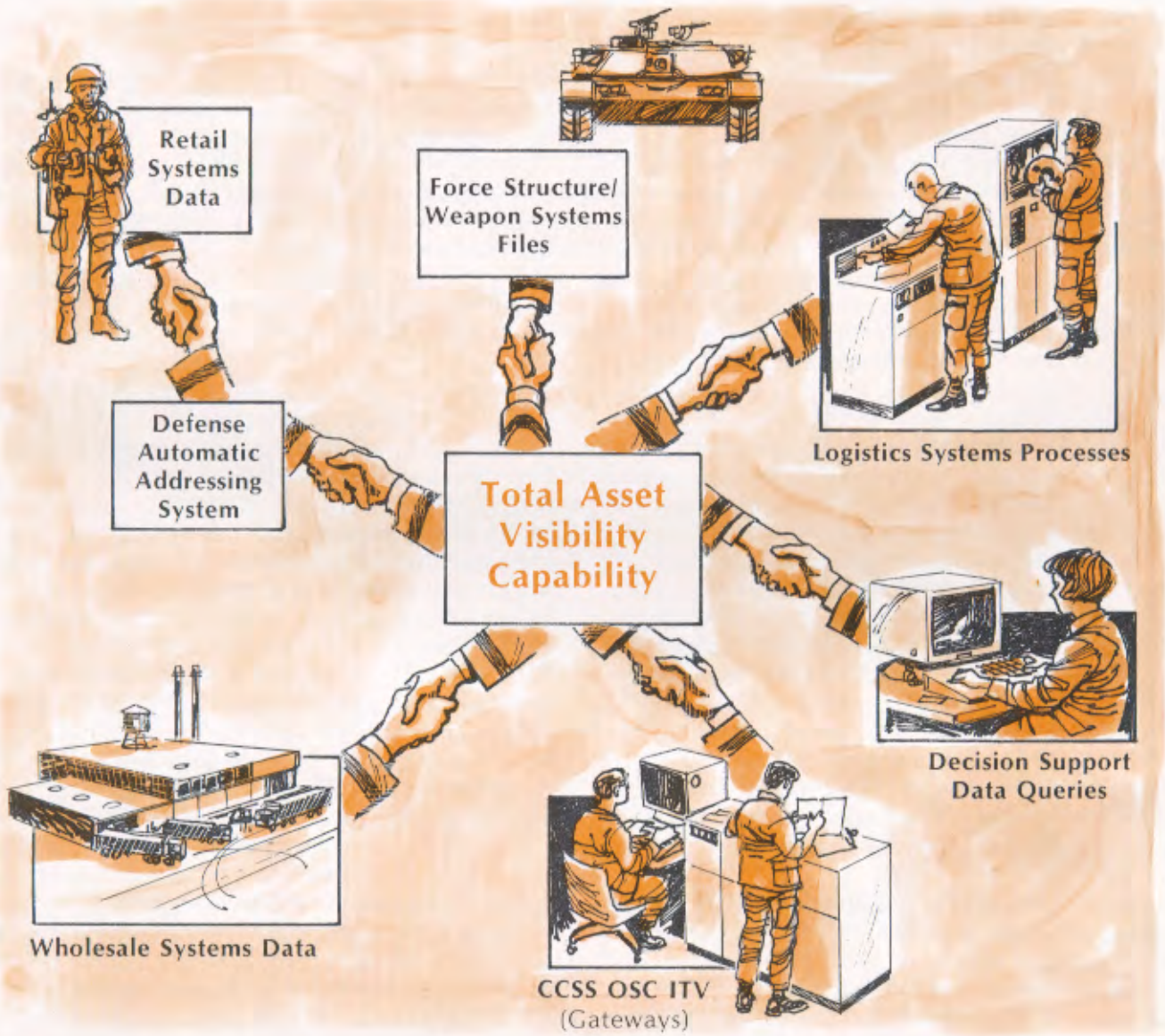
SLA's total asset visibility concept was evaluated in a proof-of-principle demonstration that began 1 October 1990 and continued through 28 February 1991. The demonstration provided visibility of more than 120 class V, VII, and IX items for the multiple-launch rocket system (MLRS), using both centralized and decentralized technologies. Centralized information management processes were demonstrated by extracting updates on transactions from the standard property book system-redesign for retail class VII items, the standard Army intermediate level system and the direct support unit standard supply system for retail class IX items, the standard Army ammunition system for retail class V items, CCSS for wholesale class VII and IX items, and the standard depot system for wholesale class V items.

These transactional updates were tied to the Army force structure, which was determined through the Army authorization documents system, force accounting system, and customer information control file. The associated support items of equipment listed in the Army's basis of issue plans were used to configure the updates for individual weapon systems. Class IX relationships to weapon systems were coordinated with the Army Materiel Command (AMC)

Materiel Readiness Support Activity, AMC's major subordinate commands, and materiel developers. Once tied to the Army force structure and configured by weapon system, transactional updates were posted to a centrally managed data base.

The proof of principle demonstrated the use of decentralized technology by "reaching through" to selected query sites to obtain additional data. A "gateway" to the Army Missile Command (MICOM) at Redstone Arsenal, Alabama, was featured to capture MLRS procurement information from the CCSS. A second gateway, to the objective supply capability (OSC) data base currently located at the Army Aviation Systems Command (AVSCOM) in St. Louis, Missouri, was used to retrieve class IX asset balances for repair parts located at Fort Hood, Texas. Total asset visibility also provided visibility on the locations of in-transit assets by accessing a U.S. Transportation Command in-transit visibility (ITV) system prototype. Since the OSC and ITV systems are still under development, user-transparent direct links could not be established during the proof of principle. However, the technology to complete direct connections was tested and will be put in use as those two systems evolve.

The capability of total asset visibility to provide support to decisionmakers was also demonstrated during the proof of principle. Online access was available at the Systems Integration and Management Activity (SIMA)-East, SIMA-West, and



SLA's total asset visibility concept.

MICOM. This access permitted users to query the total asset visibility data base as well as to obtain data from the gateway sites. Total asset visibility demonstrated its application support capabilities by passing visibility data for onhand serviceable and unserviceable items to the proof-of-principle demonstration for readiness-based maintenance.

Test and evaluation of the proof-of-principle demonstration for total asset visibility was critical. Testing was conducted in four separate segments. Segment one evaluated the accuracy of the total asset visibility data base by comparing a sample of the positions of onhand assets with both the accountable records and the physical inventory of onhand assets. This provided an assessment of how accurate the transactional update process was and how timely the data were. Segment two assessed the communications capabilities of the total asset visibility network. Communications links were tested for their responsiveness and their ability to expand to a wider base of users. Segment three examined the design of the total asset visibility data base. The data base was tested to ensure it could operate in an open systems architecture. The evaluation of these three segments was performed by the Army Information Systems Engineering Command and its contractor, Engineering and Economics Research, Inc.

Test segment four assessed how well total asset visibility functioned. In this segment, the total asset visibility menus and screens were evaluated and a survey was conducted to determine the ability of total asset visibility to provide support to management decisions. The evaluation of segment four was performed by MLRS item and program managers and representatives from the Army Materiel Systems Analysis Activity (AMSAA). AMSAA also conducted an independent evaluation of the results of the proof-of-principle demonstration.

Planning for a total asset visibility prototype began during the proof of principle. Implementation of an operational prototype is scheduled for the fourth quarter of fiscal year 1991. The target date for completing the full-scale development and fielding of total asset visibility is the end of fiscal year 1994.

The lessons already learned from Operation Desert Storm clearly show the Army's need for total asset visibility—and right now, not just in the future. Asset visibility helps ensure that the right item is in the hands of the soldier when needed. Effective inventory management also frees critical logistics assets to provide efficient combat service support.

While Operation Desert Storm has made the immediate benefits of asset visibility clear, the long-range applications cannot be overlooked. The Army must adapt to an environment of limited resources while at the same time maintaining a well-trained, well-equipped, combat-ready force. This can only be accomplished by efficiently and effectively managing Army programs and resources. Asset visibility is a key tool in enabling the Army to meet this challenge.

The Strategic Logistics Agency concept for developing total asset visibility provides the Army with the means to better manage its inventory. In short, total asset visibility will lay the foundation for both our current requirements and the future of Army logistics. ALOG

Timothy Yeager is a logistics management specialist assigned to the Army Strategic Logistics Agency at Fort Belvoir, Virginia, and is the team leader of the Total Asset Visibility initiative. A graduate of the Army Materiel Command supply management intern program, he holds a B.S. degree in accounting from Messiah College, Grantham, Pennsylvania.

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Using End-Item Codes

by Linda L. Christopher

End-item codes and the central demand data base improve materiel readiness.

Current budget constraints and planned funding reductions in the Department of Defense are forcing managers to do more with less. In the logistics arena, this calls for improved materiel management. Use of end-item codes (EIC's) and the central demand data base (CDDB) can help accomplish this. The Army needs to be aware of the importance of accurate EIC reporting and the significance of the CDDB.

End-Item Codes

EIC's are three-character alphanumeric codes that identify the Army's individual end items. The first character identifies a national inventory control point and a broad materiel category; the second identifies a more specific category; and the third identifies the national item identification number (NIIN). For example, in EIC "BPE," the "B" indicates an Army Tank-Automotive-Command-managed tactical vehicle; the "P" indicates that the tactical vehicle is gas operated and has a 5-ton load capacity; and the "E" identifies NIIN 00-835-8325.

An EIC is assigned to an end item using the criteria in Army Regulation (AR) 710-1, Centralized Inventory Management of the Army Supply System. The end item must be a principal item obtained through a procurement appropriation and managed and used by the Army. It must be type-classified and have an assigned national stock number (NSN). The Army Materiel Command's (AMC's) major subordinate commands initiate all requests for EIC assignments and deletions by forwarding them to the Army Materiel Readiness Support Activity (MRSA), Lexington, Kentucky, for appropriate action.

MRSA, which is also an AMC activity, maintains the Army's EIC master file in dBASE III format. Copies of the file can be furnished upon receipt of a written request and four formatted, 5 1/4-inch floppy disks.

Each month MRSA furnishes a copy of the EIC master file to the AMC Catalog Data Activity for update of the Army master data file (AMDF). The AMDF lists EIC's between the end item's nomenclature and line item number. EIC's are never identified on the AMDF by the spare or repair part since many parts are applicable to several different end items.

MRSA has published Supply Bulletin (SB) 38-102, End Item Codes, which identifies end items in both NIIN and EIC sequences. This publication can be obtained through normal supply distribution channels.

EIC's are used in other systems, also. They are required on DA Forms 2407 and 5504 (maintenance requests) to support maintenance on end items and components that are reportable under Department of the Army (DA) Pamphlet 738-750, The Army Maintenance Management System (TAMMS), and AR 700-138, Army Logistics Readiness and Sustainability. EIC's are used by the tactical unit financial management information system to assist commanders and managers in monitoring funds and accumulating materiel costs for end items. Technical Manual (TM) 38-C02-11, Functional Users Manual for Tactical Unit Financial Management Information System (TUFMIS), describes specific financial files that use EIC's. This publication is available by writing Director, Finance and Accounting, ATTN: SAFM-FAA-B, Indianapolis, IN 46249-2130. Another publication, The Unit Supply Update, contains policy and procedures for using EIC's on request documents.

The lowest level of field maintenance and spare and repair parts consumption is at the organization. To facilitate organizational maintenance, a prescribed load list (PLL) consisting primarily of a mandatory parts list and demand supported materiel is maintained. The PLL is managed on a one-used, one-replaced basis. When an issue is made, that action is documented and followed by a request to the supply support activity (SSA) to replace that item in the PLL. When a part is required that is not stocked on the PLL, a request also must be documented and forwarded to the SSA for supply action.

When submitting a request (DA Form 2765 or

2765-1 or DD Form 1348-6) for a spare or repair part, the PLL clerk must obtain the end item NSN or EIC from the requestor for entry in card columns 54 through 56 according to AR 710-2, Supply Policy Below the Wholesale Level, and DA Pamphlet 710-2-1, Using Unit Supply System (Manual Procedures). It is critical that the EIC for the lowest end item be identified. For example, if a radio that is installed on a truck needs repair, the EIC for the radio must be used—not the EIC for the truck. The PLL clerk must ensure that the correct EIC is used on each request by comparing the NSN for the end item being repaired with a current AMDF or SB 38-102. If neither the AMDF nor SB 38-102 shows an EIC for the end-item NSN, card columns 54 through 56 must be left blank.

The loading of EIC's into the unit-level logistics system (ULLS) equipment master data file is currently a manual process. It is accomplished by the TAMMS PLL clerk. ULLS is designed to prompt the clerk for the data needed to build or update this file. One element included in the building or updating of this file is the EIC. End items with serial numbers, except aircraft, are entered using the equipment data file manual add (M95) process. Aircraft and end items without serial numbers are entered using the equipment data file update (M31) process.

It is imperative that the correct EIC's be used when building and updating the equipment master data file. The validity of the CDDB relies heavily on this process because images of all individual request documents processed by the PLL clerk are automatically forwarded by the retail systems to the CDDB. If the EIC's in the equipment master data file are not accurate, invalid data will appear in the CDDB. This can occur when a spare or repair part is requested and the TAMMS PLL clerk enters the administrative or bumper number for the end item being repaired into ULLS. ULLS uses this number to extract the EIC from the equipment master data file and automatically enters it on the request. If the EIC was not entered or was entered incorrectly in building the file, these invalid data will be perpetuated in the CDDB by the image document (document identifier code "BAH").

To replenish PLL stock, the SSA maintains an authorized stockage list (ASL). When the SSA receives a PLL request, an issue is made. The SSA continues to issue stock until its reorder point is reached. Once that reorder point is reached, the SSA prepares a replenishment requisition to restock its ASL. The replenishment requisition is not to support a specific piece of equipment, but to reestablish an ASL stockage position. This is the reason CDDB data are captured at the organizational level in lieu of the SSA.

Although the supply system is designed to maximize the use of replenishment requisitions, there are three situations when a PLL request is passed as a requisition to the wholesale system (AMC's major subordinate commands, Defense Logistics Agency, General Services Administration, and other services). When the demand cannot be satisfied by the SSA, but the request is for a not-mission-capable supply (NMCS) or anticipated not-mission-capable supply (ANMCS), the request is passed on. A request also is forwarded when the part is not stocked on the ASL, or when the demand cannot be satisfied by the SSA but the priority designator of the unit's request is 01-08 and the required delivery date is earlier than the estimated shipping date of the SSA's resupply.

When requests for spare or repair parts are processed, images of the documentation in the form of document identifier code "BAH" transactions are captured by the automated systems. The "BAH" images, which are described in AR 725-50, Requisitioning, Receipt, and Issue System, are then transmitted via the defense automatic addressing system (DAAS) or automatic digital network (AUTODIN) to the CDDB, where they are retained in the active file for 2 years. This process is totally automatic and requires no human intervention.

Central Demand Data Base

The CDDB is a single Army-wide data base located at the Logistic Control Activity (LCA), Presidio of San Francisco, California. It was established to capture individual demands for spare and repair parts by specific end item. The CDDB serves as a central repository for all individual demands at the organizational level. It also captures demands for direct support and general support shop and bench stocks. Many of the data are for bench and shop stock replenishments and, therefore, are not identified with EIC's.

The CDDB is not to be confused with the logistics intelligence file, which is also maintained at the LCA. This file captures information relative to requisitions that are forwarded to the wholesale supply system. The CDDB, on the other hand, captures images of request documents from the using unit.

The CDDB is a management tool that significantly benefits the Army logistics community. It contributes to the Army's ability to compute spare and repair parts requirements based on actual usage, which in turn will improve materiel readiness. The CDDB reduces the potential for excessive or insufficient spare and repair parts and improves the Army's ability to justify weapon system budgets to Congress. The CDDB can be used in the refinement of failure factors, concurrent spare parts lists, and

Assistance Required	Point of Contact
Tailored reports based on the CDDB.	Commander LCA Attn: AMXLC-UA Presidio of San Francisco, CA 94129-6900
Assignment or deletion of EIC's. Copies of EIC master file.	Commander MRSA Attn: AMXMD-SE Lexington, KY 40511-5101
Answers to questions about EIC's.	MRSA AUTOVON 745-4161/4137 Commercial (606) 293-4161/4137
Answers to questions about CDDB and its capabilities.	LCA AUTOVON 586-5710/5566 Commercial (415) 561-5710/5566

Points of contact for assistance with end-item codes and the central demand data base.

total package fielding support.

With the use of CDDB, logistics support for individual units and for integrated task forces can be based on actual usage instead of estimates. PLL's and ASL's can be developed for a special exercise by comparing similar units operating in the same geographic environment.

EIC's and the CDDB help the Army keep accurate records of costs and consumption of parts throughout the life cycle of an end item. It is possible to determine when it becomes more expensive to maintain a weapon than to replace it. Likewise, parts that are not performing adequately can be identified. If a particular part is failing excessively in all applications, it could indicate a problem in the part itself. All of the data collected retain geographic identities, so geographic factors in parts consumption are apparent.

CDDB Reports

The CDDB is a valuable source of information for individual demands and usage data. It can be used to identify parts costs for specific end items and for Department of Defense activity address codes. It can relate parts usage to geographic locations, climatic conditions, and specific maneuvers.

Various analyses can be accomplished using CDDB data. LCA also has AMDF data on line to be used in conjunction with CDDB data to develop reports. For example, the CDDB does not have the unit price as a data element; however, with the AMDF on line the report can be tailored to include it. Standard reports are generated routinely for the end-item and secondary-item managers, and tailored reports can be developed for specific needs. Reports based on the CDDB can be obtained by writing Commander, LCA, ATTN: AMXLC-UA, Presidio of San Francisco, CA 94129-6900. The table above lists points of contact for other types of assistance.

The validity of the CDDB currently relies heavily on the PLL clerks. Since the EIC CDDB is still in its infancy, several problems are adversely impacting the data base. Some PLL clerks fail to place an EIC in card columns 54 through 56 of the request document when required. Some enter incorrect or fictitious codes in card columns 54 through 56 of the request documents. Many units are using "AMY" in card columns 54 through 56. This is not a valid code and should not be used. When an end item has no assigned EIC, card columns 54 through 56 must be left blank.

It is imperative that the users and PLL clerks understand the significance of correct EIC reporting. Incorrect data will distort the data base and adversely impact both the retail and wholesale supply systems. Leaving card columns 54 through 56 blank when a valid EIC applies is as bad as inserting the wrong EIC.

Many major decisions will be based on the information contained in the CDDB. In view of this it is certain that, if incorrect EIC's are reported, the Army's supply of parts could be adversely affected in the future. Because management decisions will be based on these data, proper reporting of EIC's will help to assure materiel readiness by having the correct parts on hand when needed. Another, more dramatic way of describing the result is that accurate EIC reporting will actually save lives because the parts will be available when needed. ALOG

Linda L. Christopher, a supply systems analyst at the Army Materiel Command's Materiel Readiness Support Activity, is a 1979 graduate of the supply management career intern program.

New Rules for Hazardous-Materials Packaging

by William Craze

Department of Defense shippers and transporters must follow new United Nations guidelines in the performance-oriented packaging (POP) of hazardous materials.

As of 1 January 1991, hazardous materials (HAZMAT) moving to, through, or from any United Nations (U.N.)-member country must be packaged, labeled, and certified as meeting performance-oriented packaging (POP) standards. POP standards will affect all HAZMAT shippers. As with any new program, the people affected will have many questions, which I have attempted to anticipate and answer in this article.

What is HAZMAT POP? In essence, it is a requirement that HAZMAT packaging be tested and certified that it meets performance standards. This is a significant departure from previous HAZMAT packaging rules, which were largely based on detailed specifications developed over many years. These specifications included detailed requirements pertaining to the materials of construction and their thickness, fastenings, capacities, coatings, openings, joining methods, and types of closures. For example, the specifications for wood boxes included lists of the types of wood authorized, the width and thickness of boards to be used, the types of nails authorized and the spacing for them, and often the requirements for the holding strength of the nails.

In contrast, POP specifies only general requirements for materials, construction, and capacity. Aside from these very general requirements, the strength and integrity of the packaging system are established by a set of performance tests, notably *drop, leakproof, hydrostatic pressure, and stacking* tests, which the system must pass before it is authorized to carry HAZMAT. The severity of the tests is determined by the degree of risk presented by the material to be carried. Under the new standards, HAZMAT are divided into three packing groups: packing group I, which presents a severe hazard; packing group II, which presents a moderate hazard; and packing group III, which presents a minimum hazard.

The number of tests required could be mind-boggling due to the requirement that each type of packaging be tested. A design type is defined by the design, size, material and thickness, and manner of construction and packing. Unfortunately, in the case

of combination packaging (such as a combination of gallons, quarts, etc.), each different inner packing is considered a different design type. This means that every different combination of inner and outer packaging must be tested. Fortunately, the U.S. Department of Transportation (DOT), the authority for HAZMAT packaging and transportation in the United States, has authorized some relief from this testing requirement.

Not all HAZMAT packages require testing. Exceptions to the new requirements are—

- Packages containing radioactive material, which should comply with the regulations of the International Atomic Energy Agency.
- Cylinders and other receptacles for gas.
- Packages with a net mass exceeding 400 kilograms (881.8 pounds).
- Packages with a capacity exceeding 450 liters (118.8 gallons).

When are POP standards effective? The mandatory date for compliance with POP requirements was 1 January 1991 for international moves. For domestic moves, Docket HM 181, the final rule published by the DOT to implement the new provisions, provides several transition periods.

First, the effective date of the new domestic rule as a whole is delayed until 1 October 1991. Second, for shippers and carriers prepared to implement the new standards, compliance is permitted on or after 1 January 1991. Third, a 5-year period from the effective date is permitted for continued use of old DOT package specifications. Fourth, a 3-year period from the effective date is provided for continued manufacture of packagings rendered obsolete by the final rule. Fifth, for materials poisonous by inhalation, a 2-year transition period is allowed. During these transition periods, the shipper has the option of using packagings authorized in the 1990 49 Code of Federal Regulations (CFR) or the new packagings authorized by Docket HM 181.

Where did POP standards originate? The POP standards were written by the U.N. Committee of Experts on the Transport of Dangerous Goods and adopted by the U.N. Economic and Social Council at its twenty-third session on 26 April 1957. The standards have been updated by subsequent sessions and form the basis for the U.N. Recommendations on the Transport of Dangerous Goods, a document commonly known as the "Orange Book." This publication, currently in its sixth revised edition, is the source document for POP. The "Orange Book," however, does not hold the power of law since it contains only recommendations.

Two international modal regulatory bodies have adopted the POP standards in their regulations, giving them the effect of law. These regulatory bodies are the International Maritime Organization (IMO), which regulates transport of dangerous goods by sea, and the International Civil Aviation Organization (ICAO), which regulates air transport. Additionally, the International Air Transport Association (IATA), a carrier association, has adopted the ICAO performance requirements in their regulation. The IATA is often more stringent than the ICAO in the quantity limitations and classes of materials that may be carried.

Why is DOD involved? The United States is a signatory to the U.N. General Agreement on Tariffs and Trade, an international agreement intended, among other things, to eliminate nontariff barriers to trade. Under this agreement, the United States is obligated to recognize international standards for import and export shipments and to use these international standards as the basis for our regulations. As a result, DOT issued a final rule on 21 December 1990, titled "Performance-Oriented Standards: Changes to Classification, Hazard Communication, Packaging, and Handling Requirements Based on U.N. Standards and Agency Initiative; Final Rule." This rule revises the current HAZMAT regulation (49 CFR, parts 171-180) to incorporate the U.N. standards. Since DOT cannot treat DOD any differently than any other HAZMAT shipper, we are obliged to comply.

Who is affected? Quite simply, anyone who handles, stores, procures, ships, moves, or is in any way associated with HAZMAT will be affected. It will affect both the retail and wholesale sides of DOD, and all sources of supply, including private industry.

What is being done to ease the transition? The Army Materiel Command's major subordinate commands (MSC's) have identified all HAZMAT they manage that fall under POP parameters. Subsequent to identification, they arranged testing of packaging configurations for these materials. As tests were successfully completed, the MSC's prepared packaging prescriptions to allow duplication of the tested packaging systems. Additionally, the MSC's revised packaging requirements in procurement actions to reflect the new standards. These combined actions will minimize repackaging at the depot level in the future and allow repackaging of current stocks in certified containers, as necessary.

The Marking for Shipment and Storage military standard (MIL-STD 129) has been changed to include the new marking requirements in the U.N. standards. Procedures for Development and Application of Packaging Requirements for DOD Materiel (MIL-STD 2073) and Army Regulation

746-1, Packaging of Army Materiel for Shipment and Storage, among others, have also been revised to reflect the new standards.

The Army Materiel Command Packaging, Storage, and Containerization Center's (AMCPSCC's) laboratory has tested more than 180 packaging configurations to ensure that they comply with the new standards. These tests are the basis for many of the changes in packaging prescriptions made by the MSC's. Testing is expected to be an ongoing process since new packagings and new items are being introduced into the supply system almost daily. In addition to Army activities, the AMCPSCC laboratory has provided testing support to the Defense Logistics Agency (DLA). The laboratory will provide testing support free of charge for any DOD element, contingent upon scheduling and time available. It should be noted that no packages or HAZMAT should be forwarded to the lab for testing before appropriate arrangements are made.

The Office of the Assistant Secretary of Defense (OASD) for Production and Logistics has issued guidance to the services and to DLA on POP implementation. This guidance addresses specific questions most often posed to OASD. Recent guidance includes an exception from the POP requirements when a shipment is to be made in support of Operation Desert Storm under project codes 9BU, 9BX, and 9AU. This guidance states that these shipments will not be frustrated solely for the lack of POP markings. In addition, OASD has been instrumental in voicing DOD's concerns to DOT.

The IMO has also provided some relief from the standards in two forms. The first is a grandfather clause that allows Government-owned dangerous goods packaged before 1 January 1988 to be moved by sea in their current packaging, if the packing meets the pre-POP requirements of the IMO. This relief is especially important to the ammunition community. The second is relief from the testing requirements for materials classified as *ink, resin solution, adhesives, and paint* (and *paint-related materials).* These commodities—meeting the requirements of packing groups II and III, in quantities of 5 liters or less in combination packages with a total gross weight of 40 kilograms or less—are exempt from POP testing requirements. The major problem with this exemption is that it does not currently apply to commercial air shipments. The Air Force's Military Airlift Command (MAC), however, has agreed to accept these grandfathered materials on MAC airlifts.

The DOT has also allowed some relief from the POP test requirements. These are in the form of selective testing allowances and the special pack. Selective testing allowances limit the required testing of combination packages that differ only in minor respects from the tested design type and that meet certain criteria. The special pack allows the shipment of any inner package in a combination pack that has been tested to special criteria. Specifics for both of these rulings are found in the Federal Register, Volume 55, Number 50, issued 22 March 1990.

The other services, DLA, and General Services Administration (GSA) are also actively testing and certifying to POP standards. They are putting POP requirements in contracts for new procurements and rebuys and are modifying existing contracts to meet the new requirements.

Although there is some turbulence in the system, the Army has experienced no significant problems with frustrated shipments due to the new POP requirements. It is obvious that the work done by the other services, DLA, and GSA has made it possible for the Army to make a smooth transition to POP.

You can obtain further information on the new POP standards and the Army's implementation by writing to—Director, AMC Packaging, Storage, and Containerization Center, ATTN: SDSTO-TT, Tobyhanna, PA 18466-5097; by calling AUTOVON 795-7070/7147 or commercial (717) 894-7070/7147; or by faxing AUTOVON 795-7894 or commercial (717) 894-7894. To request testing, write—Director, AMC Packaging, Storage, and Containerization Center, ATTN: SDSTO-TE-E, Tobyhanna, PA 18466-5097; call AUTOVON 795-7630 or commercial (717) 894-7630; or fax AUTOVON 795-7894 or commercial (717) 894-7894.

Formal training is also available for those who need more detailed knowledge of POP requirements and standards. The Army Logistics Management College's School of Military Packaging Technology at Aberdeen Proving Ground, Maryland, offers two courses containing POP subject matter. There is a basic 2-week course, 8B-F7, Defense Packaging of Hazardous Materials for Transportation; and a 1-week course, Defense (Refresher) Packaging of Hazardous Materials for Transportation. Enrollment information can be obtained by writing to—Registrar, School of Military Packaging Technology, Aberdeen Proving Ground, MD 21005-5001; or calling AUTOVON 298-5185 or commercial (301) 278-5185. **ALOG**

William Craze is a packaging specialist with the AMC Packaging, Storage, and Containerization Center, Tobyhanna, Pennsylvania. The primary point of contact for Army performance-oriented packaging (POP) of hazardous materials, he has had a major influence on the development of POP policy in the Department of Defense.

DCU's Help the Army Move

by Tom R. MacKenzie

The Army's deployment control units (DCU's) provide expert assistance to units moving their equipment to Operation Desert Storm.

As Operation Desert Storm unfolds, the Army continues to deploy huge amounts of military cargo and equipment to the Middle East. The movement of this materiel follows a long and complex transportation route from unit home stations to Saudi Arabia. The deployment has not been flawless, and the lessons learned will be discussed and implemented for years to come. However, many active duty and reserve units from all of the armed services, as well as many supporting installations, have already learned a valuable lesson: Special Army units are available to help them better prepare for the demanding job of rail-loading equipment for movement to ports and shipment by sea.

These special units are called deployment control units (DCU's). Located at strategic sites around the country so they can respond quickly when requested, the DCU's are uniquely prepared to help with equipment deployment needs, whether the customer is a deploying unit or an installation that supports deploying units. There are three DCU's, all Army Reserve units: the 1179th DCU at Fort Hamilton, New York; the 1190th DCU at Baton Rouge, Louisiana; and the 1394th DCU at Camp Pendleton, California. (The 1190th and 1394th DCU's were recently activated and are now providing their services on an extended basis.)

The purpose of the DCU's is to prevent the equipment of deploying units from being delayed (or frustrated) at ports and to get that equipment to its destination in an operable condition. The DCU's assist deploying units in planning and executing the staging and outloading of equipment. They also provide liaison and coordination for the movement of units to designated ports.

DCU's are composed of enlisted personnel, senior noncommissioned officers, and officers with a wide variety of skills. Many have backgrounds in the Transportation Corps, while others come from the Armor, Infantry, or Field Artillery branches. This mix of skills—from tanker to transporter—allows for "hands-on" leadership and guidance, which increases the credibility of the DCU's among deploying units.

While many units are fully capable of readying themselves for convoy movement, and may even be up-to-speed in preparing for air deployments, many lack in-house knowledge of the specific requirements for rail- and ship-loading.

A DCU can deploy on a moment's notice to help

The 1190th DCU helps Fort Huachuca, Arizona, soldiers load the equipment of a transportation unit on railcars (left). A DCU soldier guides a truck onto a flatcar (below left), while others secure vehicles with tie-down chains (above).

a deploying unit at the motor pool and the rail-loading site. The DCU can also assist installation transportation officers in dealing with the complex and time-consuming job of preparing equipment for rail, sea, or air deployment. Once during Operation Desert Shield, a DCU arrived on station less than 2 days after it was notified. The DCU then conducted inspections and provided advice and assistance for deploying units and installation transportation officers. Such short-notice missions have kept the DCU's well employed since deployments to the Middle East began last August.

DCU skills—in load planning, preparing secondary loads for movement, loading equipment on railcars, and preparing equipment for ship-loading—come from years of actual experience. The DCU's prepare units, from activated Army National Guard and Reserve to Active Army units, for smooth, efficient rail movement. The DCU's send teams to mobilization and deployment conferences to inform units what they have to do before they actually mobilize. DCU personnel attend monthly drills, train units, and perform inspections to prepare themselves

for a contingency. They then return during a mobilization to supervise the rail-loading and finalize documentation for deploying units.

DCU personnel are prepared to literally get on their hands and knees—inside cargo hatches, secondary loads, and unit containers—to help units and installation transportation officers prepare cargo for movement. For installation transportation officers, the additional transportation-qualified personnel supplied by the DCU's are helpful because installations usually do not have enough people to handle the increased workload generated by a massive deployment.

The officers and senior noncommissioned officers in the DCU's know the importance of properly securing a unit's hazardous materials. Oxygen tanks, for example, cannot be merely loaded on the back of a 2 1/2-ton truck. DCU's check hazardous cargo carefully.

The DCU's verify documentation on the automated unit equipment list and make sure the items on hand match up correctly with the paperwork (or electronic) trail. Substitute items can disrupt loading operations and result in unnecessary delays in deployment. If a Military Sealift Command ship has been requested to haul a specific unit's cargo and has planned its load according to the dimensions of that cargo, even minor changes can hold up the ship-loading operation. In such situations, DCU's have earned their keep by identifying potential problems, thus saving units and installation transportation offices time and money and avoiding possible safety problems.

Safety, both in protecting unit personnel and avoiding potential rail hazards, is a primary concern for DCU's. A DCU works with railroad inspectors to make sure loading meets safety standards; otherwise, the railroad will be held financially responsible for any damage to Army vehicles or any civilian damages or injuries resulting from improper loading.

If palletized cargo or vehicles are not properly secured, they can fly off the railcar and cause significant damage. Even the tie-down chains securing heavy vehicles can become safety hazards if the loose ends of the chains are not secured with wire. The loose ends can hang off the edge of flatcars, possibly causing damage to other equipment on the train, signal posts by the side of the tracks, or even other trains on adjacent tracks.

One fully activated DCU can support up to 12 units deploying from different installations. The experience of Fort Huachuca, Arizona, offers one example of how a DCU has helped an installation cope with the deployment demands of Operation Desert Shield.

The use of portable, generator-equipped light sets (shown at right in photo above) permit loading operations to continue at night. Loading hazardous materials (below) requires special care. DCU expertise enables the loading to meet railroad standards (right).

Fort Huachuca sent an active duty signal brigade to the Middle East and supported the mobilization of a deploying Army National Guard transportation company, National Guard bulk petroleum company, and Army Reserve medium truck (petroleum) company. The 1190th DCU prepared 762 pieces of equipment for shipment for Fort Huachuca, ensuring that all items were in the proper shipping condition; hazardous materials were properly stowed, blocked, and labeled; and supporting documents were properly completed. The DCU also prepared all the LOGMARS (logistics applications of automated marking and reading symbols) information for faxing to the port.

As Ben David, chief of plans and operations in the Fort Huachuca Directorate of Logistics, commented on the DCU's performance, "Since Desert Shield has started, I've had excellent response from Military Traffic Management Command (MTMC) on DCU support. To request DCU support, I called MTMC Western Area, told them what I needed, and when. They have been more than willing to support me."

Many installations and ports have benefited from DCU expertise. DCU personnel have worked with Air Force, Marine Corps, and Navy activities as well as Army installations and units. The list of those assisted would include all the major players in the deployment to the Middle East. U.S. Army, Europe, for example, used DCU support to speed the massive loadout of deploying VII Corps elements.

"I feel this Desert Shield operation has probably been the proving grounds for the value of the DCU," observed Fort Carson, Colorado, installation transportation officer Dan Mestas. "We in the field don't have the staff to respond in total to a crisis situation." Mestas credited the DCU's with disseminating numerous lessons learned from their experience in seaports and various installations.

Deploying units, particularly reserve units of any service, should not hesitate to call for DCU assistance. DCU personnel will teach a customer unit the right way to prepare and load its equipment, thus eliminating the need to restow secondary loads over and over. Their expertise will save time and reduce the potential for damaged equipment.

To request the assistance of a DCU, installation transportation officers in the continental United States should contact the Military Traffic Management Command. Call MTMC Western Area at Oakland, California, at AUTOVON 859-3242 or commercial (415) 466-3070; call the Eastern Area at Bayonne, New Jersey, at AUTOVON 247-5505 or commercial (201) 823-5505. Oversea units should contact their respective MTMC elements. A deploying Army Reserve unit can also request DCU help through its Continental U.S. Army Deputy Chief of Staff for Logistics. ALOG

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The photos illustrating this article were taken by Chief Warrant Officer (W2) Doug Wynn of the U.S. Property and Fiscal Office in Phoenix, Arizona.

Building Griffin Base

by Major Scott G. West

The author describes how the 407th Supply and Transport Battalion built a base camp in Saudi Arabia.

Within 1 week of the Iraqi invasion of Kuwait, elements of the 407th Supply and Transport (S&T) Battalion, 82d Airborne Division, from Fort Bragg, North Carolina, began arriving in eastern Saudi Arabia as part of Operation Desert Shield. The division moved to a Saudi military installation that became known as Champion Base.

As the strength of the division grew, overcrowding had a dire effect on everything from potable water to motor park space. Soldiers were allocated only enough space for their sleeping bags and rucksacks. Each billeting area was jammed to capacity. To alleviate some of the problems associated with the overcrowding, the 407th, nicknamed the "Golden Griffins," was given authority to reconnoiter for an area in which to establish their own base camp. This began the creation of Griffin Base, Saudi Arabia.

The process of building a support base for the battalion began with an aggressive reconnaissance of the terrain located in the 82d's division support area (DSA). Several locations—which ran the gamut from urban, industrial complexes to barren, desert wasteland—were identified as potential sites.

One of the most important criteria for selecting a site for Griffin Base was the battalion's ability to secure the area. The battalion would have to defend Griffin Base against ground and air attacks. Another prime concern was the availability of potable water. The battalion would need enough water to supply the DSA and to provide a backup supply for the brigade support areas. Potentially, the division could consume over 80,000 gallons of potable water daily. The site selected for Griffin Base and the surrounding terrain had to support the operation of eight reverse-osmosis water purification units.

Other site requirements included space to bivouac up to 500 soldiers and to operate—

- Supply points for items of class I and classes II, IV, and VII.
- A class III supply point with a fuel system supply point (FSSP).
- An ammunition transfer point.
- A field laundry.
- Graves registration and salvage collection points.
- A helipad for sling-load operations using CH-47 helicopters.

Also, sufficient parking space was required for over 120 items of rolling stock. The storage space required for supplies exceeded 200,000 square feet of open storage and 100,000 square feet of covered storage.

After 2 weeks of constant reconnaissance and negotiations with property owners, the list of possible

A soldier of the 407th Supply and Transport Battalion guards the perimeter of Griffin Base (left), while parachute riggers of the battalion's quick-reaction force lay concertina wire to secure the perimeter (above left). A paratrooper at Griffin Base replaces a tube in a 2 1/2-ton truck tire (above right). (Photos courtesy of *Desert Dragon*.)

locations was pared down to a few acceptable operating sites. By 1 September 1990, the battalion commander had decided on the best site for Griffin Base.

A request for the facility was submitted through the division staff to the terrain management cell in the G3 section of the XVIII Airborne Corps. The request was hand-carried through many offices and agencies for the bureaucratic "chop" and finally landed in the Corps of Engineers Middle East-Africa Project Office. This agency's real estate section did the actual negotiation and contract work. After nearly 3 weeks, the real estate office and owner signed a letter of intent to lease the facility.

The 407th moved from Champion Base to Griffin Base in several steps. The move began with extensive site preparation by elements of the 618th Engineer Company (Light Equipment), 82d Airborne Division. The engineers constructed roads, ammunition bunkers, FSSP berms, helipads, motor parks, and security berms. The battalion S4 section requested lumber, portable showers, latrines, washstands, and numerous other supplies and equipment to complete the living requirements of our troopers.

When the basic site preparation was completed, the battalion's main body deployed to Griffin Base and immediately began combat service support operations from the new location. This move was conducted on 28 September.

Once the 407th occupied the area, it improved the site. The supply points were improved with well-planned and well-executed storage procedures and a flow-through road network. Bivouac sites were improved to ensure that the troops were as comfortable as possible and all field sanitation and safety requirements were met. Numerous actions were taken to improve base security and unit morale. The battalion's repair and utility personnel constructed a combination soccer and football field, a softball field, a volleyball court, a horseshoe pit, apparatuses for weightlifting, a half-mile running track, a room for television and video equipment, and a recreation tent.

Griffin Base has been fully operational for more than 6 months. Improvements to the area continue every day. The soldiers of the 407th S&T Battalion have learned many lessons in how to select, establish, and improve a new operating site. These lessons have greatly improved the battalion's ability to support the 82d Airborne Division and increased the battalion's confidence in its ability to perform its mission.

Major Scott G. West is the executive officer of the 407th Supply and Transport Battalion, 82d Airborne Division, serving in Saudi Arabia.

An Installation Perspe

Serving as a mobilization station for 39 units, Fort Sill, Oklahoma, learned valuable lessons about logistics support of contingency operations.

Although our attention has shifted from Operation Desert Shield to Desert Storm, from deployment to combat, we should not forget the lessons that were learned or relearned during the earliest phases of the Middle East crisis. Operation Desert Shield required the most rapid buildup and deployment of Active Army and Reserve component units in U.S. history. Fort Sill's role as a mobilization station in support of 39 units is a success story that contains many lessons about logistics support of contingency operations.

Fort Sill's Plan

The best way to quickly process mobilizing troops is to follow a good mobilization and deployment plan. (At the outset of Operation Desert Shield, our plan was in the process of being revised.) Since our plan is based on support for either a 200,000-soldier callup or full mobilization—neither of which was required during Desert Shield—the expected manpower augmentation of military and civilian employees and the additional office space and communications equipment needed for mobilization and deployment were not available.

To accommodate the surge of units that were subject to alert, we had to augment specific sections with borrowed military and civilian manpower or new employees. Much of the borrowed military manpower came from the Army Field Artillery School and III Corps Artillery at Fort Sill; there we recruited soldiers who were not subject to immediate deployment. Civilian augmentees, such as secretaries and logistics specialists, were either shifted from other departments or hired on a temporary basis. This augmentation and shifting of labor brought some initial challenges, such as establishing task responsibilities, writing job descriptions, processing overtime, finding office space and equipment, and obtaining security clearances. But once the scope of Operation Desert Shield was realized, responsibilities were quickly distributed by the directorate of plans, training, and mobilization (DPTM), and shifts were established for round-the-clock operations. Several DPTM employees were detailed to work in the 24-hour-a-day emergency operations center.

The Directorate of Logistics (DOL) contractor hired 37 new employees to paint and maintain vehicles and equipment and to perform other logistics support operations. The new employees contributed significantly to the 27,797 manhours required to paint, repair, process, and ship 2,308 wheeled vehicles, 947 trailers, 454 tracked vehicles, 156 CONEX containers, and 86 MILVAN's.

Labor from the Correctional Confinement Facility was tapped to build 25 shipping and crating containers for crew-served weapons and 50 portable latrines for units from III Corps Artillery. This

A multiple-launch rocket system and heavy, expanded-mobility, tactical trucks are loaded aboard railcars for delivery to a seaport and shipment to Saudi Arabia.

ctive on Desert Shield

by Colonel James R. Russell

A mobilization assistance team member inspects a soldier's M60 machinegun to ensure that it is serviceable and mission-capable (left). A civilian mechanic makes adjustments to an M109-series, 155-millimeter, self-propelled howitzer (above).

resulted in a substantial savings in civilian labor.

Predeployment

Another important lesson learned was the need to send a liaison team to alerted units' home stations as soon as possible. The four- to five-person teams were composed of a team chief, a mobilization assistance team representative, a training point of contact, a logistician, and a personnel point of contact. While most team members were officers and senior noncommissioned officers from the DPTM, the logisticians normally came from the materiel readiness branch of the DOL.

The mobilization assistance team helped units assess their training, logistics, and personnel needs before moving to the Reserve component reception center at Fort Sill. Armed with information collected by these teams, Fort Sill was able to prepare for the units by formulating the units' training schedule, initiating logistics actions to solve equipment shortages, and accomplishing many critical support functions, such as preparing billets, parking areas, and ration accounts.

Arrival at Fort Sill

The DOL's contributions were extraordinary once deploying units arrived at Fort Sill. The DOL is the installation's proponent for all deployment logistics actions, including transportation and preparation of installation logistics summaries.

Transportation support from the transportation branch of DOL included moving soldiers to and from live-fire ranges and nuclear, biological, and chemical warfare training sites. The branch also transported troops to their departure air group

A DOL employee spray-paints a 5-ton truck tractor using desert-camouflage, chemical-agent-resistant-coating paint (above). A 15,000-pound forklift secures a 6-ton shop van semitrailer on a railcar (above right). Soldiers load 2 1/2-ton trucks containing CONEX's on railcars (right).

center, either Fort Sill's Henry Post Army Air Field or Altus Air Force Base, about 60 miles away. Using a recreation center on Fort Sill as a staging area not only facilitated the final manifest call but also provided departing soldiers with a comfortable relaxing area, complete with snack bar, telephones, televisions, and game machines.

How to properly prepare and use an installation logistics summary was another key lesson learned. We initially did not know how many units would be alerted and deployed or how much logistics support each would require. By continually using the installation logistics summary and working closely with the liaison teams, we were able to identify all the equipment-readiness-code-A (war) equipment located at Fort Sill. We either replaced or cross-leveled equipment representing 123 line item numbers (LIN's) in the Active Army units and 116 LIN's in the Reserve component units.

Items that were not immediately available from Fort Sill were located with the assistance of item managers at nearby depots or the National Guard Bureau in Washington, D.C. For example, one alerted unit required high-mobility, multipurpose, wheeled vehicles (HMMWV's) that it did not have. In a matter of days, most of the needed HMMWV's were located in North Dakota and the rest were found in Alabama. These vehicles were shipped by rail to Fort Sill for desert camouflage painting and final preparation for oversea movement.

Preparation for Deployment

Ensuring that all deployable units had a 15-day supply of expendables and their prescribed load list of repair parts and supplies presented another challenge—and again, the materiel readiness branch met the challenge. By providing these essential supplies before deployment, Fort Sill was able to relieve logistics units in Saudi Arabia of some of their logistics burden and to ensure that deploying units could adequately sustain themselves until they reached their areas of operation.

The sheer magnitude of deployment necessitated

a high degree of decentralization and delegation. This freed senior Fort Sill officers from their normal duties as directorate heads and chairmen of departments and allowed them to concentrate on assisting the deploying units. These colonels and lieutenant colonels were able to help prepare deploying units by discussing and managing unit liaison concerns, making sure that the necessary resources were available, observing training, and representing the installation command. The deputies of these directorates and departments, normally civilians, found themselves managing the myriad of day-to-day installation problems. This system worked well, and the post continued to operate smoothly.

The DPTM established a 24-hour-a-day operation to monitor every alerted unit from its departure from home station to its departure from Fort Sill bound for Saudi Arabia. This allowed problems and conflicts to be identified and resolved immediately.

Logistics support for deployment included painting vehicles, a process that consumed 9,500 gallons of chemical-agent-resistant-coating (CARC) paint; issuing 50,000 gallons of petroleum, oils, and lubricants; issuing 17,856 sets of desert battledress uniforms; and issuing 12,904 cases of ready-to-eat meals (MRE's). The DOL also processed and dispatched 1,257 railcars, totaling almost 22 shiploads of cargo. The managing, marshaling, loading, and shipping of this tremendous amount of cargo, without a significant accident, is testimony to the dedication, training, and professionalism of all involved.

Key Lesson Learned

The key lesson learned was this: Faulty equipment must be identified as early as possible. We learned the benefit of having a logistics assistance and inspection team from the DOL inspect a deploying unit's equipment as soon as possible after its arrival at Fort Sill. As a result, many unserviceable or not-mission-capable items—trucks, protective masks, weapons, and other mission-essential equipment—were discovered and repaired or immediately replaced. Although potentially expensive and time-consuming, this process ensured that every unit that departed Fort Sill had what it needed to perform its mission. Our commitment to providing troops' logistics needs undoubtedly had a positive effect on their morale.

The logistics support of units deployed from Fort Sill to support Operations Desert Shield and Storm continues to be successful. As of 26 December 1990, all 20 of the Reserve component units that got support from Fort Sill saw significant improvements in their equipment-on-hand C rating. Of the 19 Active Army units that received support from Fort Sill, 16 saw improvements.

This is not to say that things have always gone perfectly. There are many challenges and issues that are yet to be overcome but, so far, a potential nightmare has turned into a very effective strategic logistics support operation. ALOG

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Mobilizing Individual Ready Reservists

More than 2,000 individual ready reservists do the 'duffelbag drag' at Fort Lee.

Pursuant to Presidential Executive Order of January 18, 1991: You are ordered to active duty. . . . Proceed from your current location in sufficient time to report on the date specified. . . . Reporting date: 31 Jan 91.

More than 20,000 individual ready reservists (IRR's), nationwide, received a copy of this mailgram. Most were not surprised. They knew when they left active duty less than a year ago that they could be called back to duty during a crisis. They knew the President had authorized a recall, and they knew the conflict in the Persian Gulf had recently developed into a war.

The awareness of the situation didn't soften the blow, however. People were torn from jobs, schools, and families. Many who had postponed having children until after completing active duty had settled to a normal family routine, never suspecting that a Nation that had not recalled its individual ready reservists since the Korean War would be forced to do so again.

IRR's are not members of a particular reserve unit. They do not report for periodic training. Most enlisted soldiers have an 8-year commitment to service, only part of which consists of active duty. After separation from active duty, they automatically become IRR's until their 8-year commitment has been fulfilled. The President of the United States can recall IRR's whenever necessary. Because this authority had not been exercised in 40 years, soldiers did not give much thought to this part of their military service contract until Saddam Hussein's inva-

A soldier accepted for activation receives a cash advance to cover expenses until he receives his first regular paycheck.

Individual ready reservists (IRR's) queue up for the first phase of in-processing (left). Duffelbags and suitcases serve as temporary home bases (above). A soldier selects uniform items at the central issue facility (below).

sion of Kuwait.

In late January, more than 2,600 "RT-12's"—those who left active or reserve duty less than 12 months prior—converged upon Fort Lee, Virginia. Fort Lee was designated as one of 20 mobilization sites to support Operation Desert Storm. After traveling by air, rail, or bus, the men and women arrived at a huge, corrugated-metal Quonset hut that ordinarily served as a field house for various sports activities. The interior of the building had taken on a new appearance, though, as it had been hastily equipped with computers, medical equipment, and tables stacked with forms and papers. Civilians and soldiers staffed the large, open area, waiting for the onslaught of new arrivals. A few arrived early, but the majority reported in the last few hours before deadline.

The Fort Lee staff was committed to making the rapid transition from civilian to soldier as painless as possible for those who reported. This was the closest thing to full mobilization that the home of the Quartermaster Corps had seen: The incoming were experienced soldiers who probably had not seen hostile action during their military service and were likely to be thrust directly into a combat zone within

An activated soldier loses his shoulder-length locks (above left). Soldiers practice checking chemical suit closures (above right), assembling the M16A1 rifle (below), and operating equipment such as water purification units (right).

the month. There was an air of quiet urgency. Most spoke in hushed tones. Everyone in the gym realized the importance of the mission, but the new arrivals weren't sure they wanted to be there, and the processing personnel weren't sure they wanted to push them.

The IRR's who reported to Fort Lee held quartermaster military occupational specialties (MOS's). Most were supply specialists, but there were also many petroleum and water specialists. While at Fort Lee, those who were not screened out for various reasons would receive refresher training in their MOS's and review common task procedures to prepare for their new assignments. First, though, they had to endure in-processing or, as many put it, the "duffelbag drag."

Hundreds of soldiers spent the first night in the field house. While awaiting various stages of in-processing, some slept on the bleachers on one side of the gym. Others tried to rest their heads on duffelbags and suitcases that were scattered over more than 400 square yards on the opposite side of the gym. On the morning of 1 February, bleary-eyed men and women were beginning to feel like soldiers again after hours of waiting in lines and filling out forms. Each had a cursory medical check, and some were referred to the garrison medical or dental clinic for care or treatment. Some—especially those who finally gave way to tears—talked with the chaplain on duty. Each was assigned to a company for training. Finally, as if being rewarded for his or her patience, each was given a $250 cash advance to defray expenses until their first regular paycheck arrived. Buses took groups of soldiers to the quarters where they would eat, sleep, and train during the next 2 or 3 weeks.

To assist with processing the recalls at Fort Lee, part of the 408th Personnel Service Company, Queens, New York, was activated. They, too, had left homes and families for up to a year to assist in

the war effort. Despite this fact, the general attitude of the 408th was positive. One soldier from the unit reported for duty at 1800 the first night, and at 0800 the next morning she still managed a smile and a kind word for each soldier who stopped at her station. She had been a full-time college student until her reserve unit was activated just days before. She could empathize with those who were now reporting for duty.

Pennsylvania Representative John P. Murtha, escorted by Lieutenant General Leon E. Salomon, Fort Lee commander, visits troops who are being activated. Congressman Murtha is chairman of the House Appropriations Defense Subcommittee.

Although many didn't want to be there, the majority were quick to state that they were anxious to use their skills to defend their country. One doctor who had been on night duty said few soldiers had created bogus medical excuses for screening themselves out and, in fact, most had a "let-me-at-'em" attitude.

Lieutenant Colonel John Rousselot, Adjutant General, Combined Arms Support Command and Fort Lee, stated, "Most IRR soldiers that are being in-processed have a good attitude. While some are irritated by the wait, most realize that Fort Lee is processing a great many soldiers in a short time. They are appreciative of the support and help given by the many personnel that are conducting the operation."

Within the first 48 hours, those who were initially accepted for activation had uniforms, a bed to sleep in, a company commander, and a drill sergeant. Diagnostic testing and training began immediately. Within 3 weeks, the soldiers proved their knowledge of common tasks, survival skills, and critical job elements. Once certified by the company commander as prepared for duty, they waited for orders. Camaraderie increased as the days passed, and everyone became anxious to find out where everyone else was headed. Some were assigned to stateside jobs to replace personnel already deployed, and others were deployed to the Middle East.

An Army post that normally did not function as a mobilization site had accomplished an extraordinary task. In less than 3 weeks, more than 2,000 individuals had been transformed from jean-clad civilians doing the "duffelbag drag" to proud and ready soldiers, prepared to fight. ALOG

Deploying the 'Keepers of th

Pundits, self-styled military theorists, and retired flag officers are pontificating profusely on the pros and cons of Operation Desert Storm. Their arguments cover just about every facet of America's latest military undertaking. Although not always acceptable to many soldiers, their views and opinions serve a useful purpose in a democracy like ours.

Lost in all this rhetoric, however, is a story of significant news value that no one seems to be telling. It is a good news story. It is a story of professionalism and competence, a story of how intensely trained, dedicated soldiers successfully accomplished their part of the largest military mobilization since World War II—and did it not from the United States, but from Europe, a first in U.S. history.

This is the story that needs telling: the account of how an army answered its nation's call to duty quickly and without fanfare or precedent. It is not only a story of dedication but also a story of how a well-trained organization successfully accomplished a mission.

This story is about the U.S. Army, Europe (USAREUR)—the "keepers of the peace." What makes its recent mission unique is that USAREUR units, already forward-deployed, further deployed to another theater to provide additional offensive capability to U.S. Central Command Forces in Saudi Arabia. This is the first time that a deployment of this kind and magnitude has been carried out by U.S. forward-deployed forces. It adds a new twist to the Army's role as a strategic, deployable force and reinforces the importance of forward-deployed forces in the post-cold-war world. Moreover, there are few soldiers, if any, who ever thought this kind of thing would happen.

In early November 1990, USAREUR's Commander in Chief, General Crosbie E. Saint, was given the mission to deploy a corps to Southwest Asia to reinforce units there. To appreciate the excitement surrounding this task, one needs to understand that, at the same time, there were several other significant events going on in USAREUR. About 21 battalions were preparing to stand down, turn in their equipment and property, and return to the United States. Some of these units had departure dates as early as 1 March 1991. Others were scheduled to leave by 1 May 1991. This group of approximately 15,000 soldiers, their families, and their pets were the first half of the Secretary of Defense's announced removal of 30,000 soldiers from Europe by 1 October 1991. Plans to withdraw the remaining contingent were also well under way.

In addition to standing down units, USAREUR was involved in preparations for the closure of about 100 installations, the return of facilities and other properties to the German Government, and the restructuring of the residual force into a combat-ready corps capable of continuing the mission of the North Atlantic Treaty Organization (NATO).

In the midst of this changing environment, General Saint called his commanders together and, after discussions with the Commander in Chief of the U.S. European Command, General John Galvin, mapped out what needed to be done in order for the VII Corps, 2d Armored Division (Forward), and other selected units to be deployed to Saudi Arabia. The deployed corps consists of the lst Armored Division; 3d Armored Division, normally a part of the U.S. V Corps; 2d Armored Cavalry Regiment; 2d Corps Support Command; and other, smaller units.

The deployment has been completed. In about 7 weeks, USAREUR moved more than 70,000 soldiers and 40,000 pieces of equipment from Germany to Saudi Arabia. This operation was one of the more challenging movements of forces since the 1944 Normandy invasion.

USAREUR's deployment is noteworthy because of its magnitude, complexity, and rapid execution. Unlike other deployments where units tend to be located on a single installation, the subordinate units of USAREUR's deploying corps came from several installations and numerous small communities. Such dispersion tends to complicate the movement process.

The corps' thousands of tracked and wheeled vehicles, hundreds of aircraft, and tons of other equipment were deployed by a variety of means. These modes of travel included rail, barge, air, and road convoy. About 600 train equivalents were used to transport the corps equipment to 3 seaports. From these sites, more than 100 ships transported the materiel to Saudi Arabia. The deployment was a kind of Reforger (Return of Forces to Germany) in reverse. Some witty soldiers called it "Deforger"

e Peace'

by Colonel Phillip W. Childress

(Departure of Forces from Germany).

The soldiers of the deployed units moved by air from five aerial ports scattered throughout Germany to marry up with their equipment in theater. Air movement schedules were timed so that the troops arrived only 1 to 2 days before their equipment.

Getting the troops to Saudi Arabia on time and in good order was only part of USAREUR's challenge. The other part, taking care of the families remaining behind, is just as hard a job. Since the deploying units will be returning to Germany, families are staying put. They are in familiar surroundings, among friends, and part of a family support structure that is already in place and functioning well. Moreover, they have access to several effective means of communication with their loved ones in Saudi Arabia. Military communities are bonding together as never before to help each other, and local German communities are offering their assistance in many ways to those families staying behind.

How was USAREUR able to carry out this complex deployment mission while continuing its NATO role, standing down units for withdrawal to the continental United States, restructuring communities, and taking care of tens of thousands of family members whose loved ones have gone to war? The short answer is its outstanding people—its soldiers, Department of the Army civilians, host nation employees, and the families of all three groups.

To do this most difficult job, USAREUR has the competent, confident commanders and noncommissioned officers; high-quality and well-trained soldiers; modern equipment and lethal weapons; and a sound war-fighting doctrine. The Army's combat training programs, including USAREUR's Combat Maneuver Training Center, NATO exercises, and the Battle Command Training Program, are paying off. USAREUR is better than it has ever been. When the Nation called, USAREUR was ready. The only unfortunate aspect of the deployment to Saudi Arabia is that those who deployed did not get the credit they deserved, primarily because the operation went so well it was not noticed.

USAREUR's VII Corps will add a tremendous offensive capability to the force already deployed in Saudi Arabia. It will give the Commander in Chief of the Central Command a Sunday punch. Because USAREUR forces are forward-deployed, their training regimen has been rigorous. They trained in USAREUR at the Combat Maneuver Training Center at Hohenfels, Germany, twice a year. USAREUR soldiers qualified twice a year on all their weapon systems. Additionally, most of USAREUR's battalion and brigade commanders spent some time at the National Training Center at Fort Irwin, California. These commanders and the soldiers they have trained are prepared for a battle of mobility and firepower.

Those who think USAREUR units have trained merely to hunker down in their wartime fighting positions awaiting the onslaught of the enemy hordes are way behind the times. High on General Saint's list of mission-essential tasks for USAREUR units are coordinating rapid movement of large units over long distances; combining all arms and rapidly shifting units; and focusing combat power to take advantage of the opportunities of a fast-moving fight. USAREUR units are seasoned practitioners of mobile warfare.

USAREUR broke new ground in its deployment of a corps to Saudi Arabia. Although this accomplishment alone is a story worth telling, the real scoop is that America's sons and daughters in USAREUR are meeting the challenge, just as they and their predecessors have been doing for 45 years while keeping the peace in Europe. It was they who helped bring about the unbelievable changes that the world has witnessed in Germany during the past year.

The addition of VII Corps to the outstanding U.S. Forces already in Southwest Asia will help persuade Saddam Hussein to abandon his aggression and withdraw from Kuwait. **ALOG**

Colonel Phillip W. Childress is the Chief of Public Affairs, United States Army, Europe. He holds a B.S. degree in English from the University of Tennessee at Martin and an M.A. degree in history from Northeast Louisiana University at Monroe. He is a graduate of the Army Command and General Staff College and the Army War College.

What You Tell Us—
Reader Survey Results

We asked and you responded! Thank you for providing the information we asked for in our "Reader Survey" in the September-October 1990 issue. Your input is vital in helping *Army Logistician* stay attuned to your logistics information needs and interests. Your responses indicate that we are, indeed, accomplishing our purpose of furthering the Army's readiness and sustainment objectives.

The "report card" you gave us looks like this: 68 percent of you read all six issues during the year, 6 percent read five, 12 percent read four, 10 percent read three, 2 percent read two, and less than 1 percent read only one issue.

Our distribution proved timely, with 48 percent of you getting your issue *before* the cover date, 35 percent of you getting the issue during the first month of the cover date (for example, *May* of the May-June issue), and the remainder of you seeing the issue during the second month of the cover date.

Forty-five percent of you read all or almost all of each issue and 38 percent of you read more than half. Another 17 percent read about one-quarter. The majority of you get copies through distribution to your unit or office, with the remainder of you getting copies by direct mail, paid subscription, library, and dayroom availability, in that descending order.

Thirty-six percent of you read the issue and route it, while 24 percent of you keep the issue for reference. Sixteen percent of you give your issue to someone else and 12 percent of you clip articles and items to keep for reference. Ten percent leave the issue in the dayroom, library, or office.

In question 7, we asked you to indicate your agreement or disagreement with a list of attributes. To summarize your responses, 51 percent of you strong-

ly agree that *Army Logistician* is easy to read; 46 percent agree that it is easy to understand; 49 percent agree that it is well written; 50 percent agree that the information is new and useful; 41 percent agree that the information helps on the job; 50 percent agree that the information makes one think; 57 percent agree that the information is interesting; and 41 percent agree that the publication provides source material.

As to our helpfulness in keeping you informed and up-to-date on logistics changes and developments, 23 percent of you said we are extremely helpful, 45 percent said very helpful, and 26 percent said helpful.

We asked if you had used suggestions, ideas, or information from *Army Logistician* to better understand your logistics job, improve your performance, or solve logistics problems in your unit or organization in the past 12 months. Four percent of you said very frequently, 23 percent said frequently, 46 percent said sometimes, and 16 percent said seldom.

In questioning the helpfulness of our news columns, "Emphasis" and "Digest," we asked if they were very helpful, helpful, or not helpful. Sixty-nine percent said helpful, 27 percent said very helpful, and less than 5 percent said not helpful. Fifty-three percent of you said to keep the news columns about the same, while 46 percent of you asked that they be expanded.

We have always recognized that our readers comprise a very diverse group, a fact borne out by your responses to the article subjects that you would like to see more on or less on. Of the nine subject areas listed, here's how you ranked them in percentages:

	More	Less
1. Supply	88	12
2. Professional development	83	17
3. Maintenance	79	21
4. Joint logistics	69	31
5. Services	68	32
6. Transportation	67	33
7. Environmental issues	57	43
8. Acquisition, procurement, and contracting	56	44
9. Facilities	37	63

In overall content, appearance, and readability you gave us good marks and we appreciate them. Fifty percent of you rated *Army Logistician* very good, 32 percent of you rated us excellent, 16 percent of you said good, and 2 percent of you rated us fair.

The remainder of the information you gave us was about *you*, and we think you will find the composite data as interesting and informative as we did.

Seventy-five percent of you are military and 25 percent are civilian. Of those of you in uniform, 52 percent represent combat service support, 12 percent represent the combat arms, and 11 percent represent combat support. Slightly less than 1 percent of you represent our sister services: by number of responses in descending order, you are airmen, marines, and sailors.

Thirty-five percent of you who are military are in the Active Army, 21 percent are Army Reserve, and 12 percent are Army National Guard. Twenty-three percent of you indicated specific service categories and 8 percent of you are retired military. In terms of numbers of readers by pay grade, ranging from the greatest number of respondents to the least, you are: 04 to 06; E5 to E7; 01 to 03; and WO1 to CWO4. Among civilian readers in numbers by pay grade, you are: GS/GM 12 to 14; GS 9 to 11; GS 8 and below; and GS/GM 14 and above. By age groups, most of you are 40 to 49, followed closely by 50 and over, then 35 to 39, and 30 to 34. Interestingly, only 7 percent of you are under age 29. At the time of our survey, 80 percent of you, both military and civilian, were stationed in the continental United States.

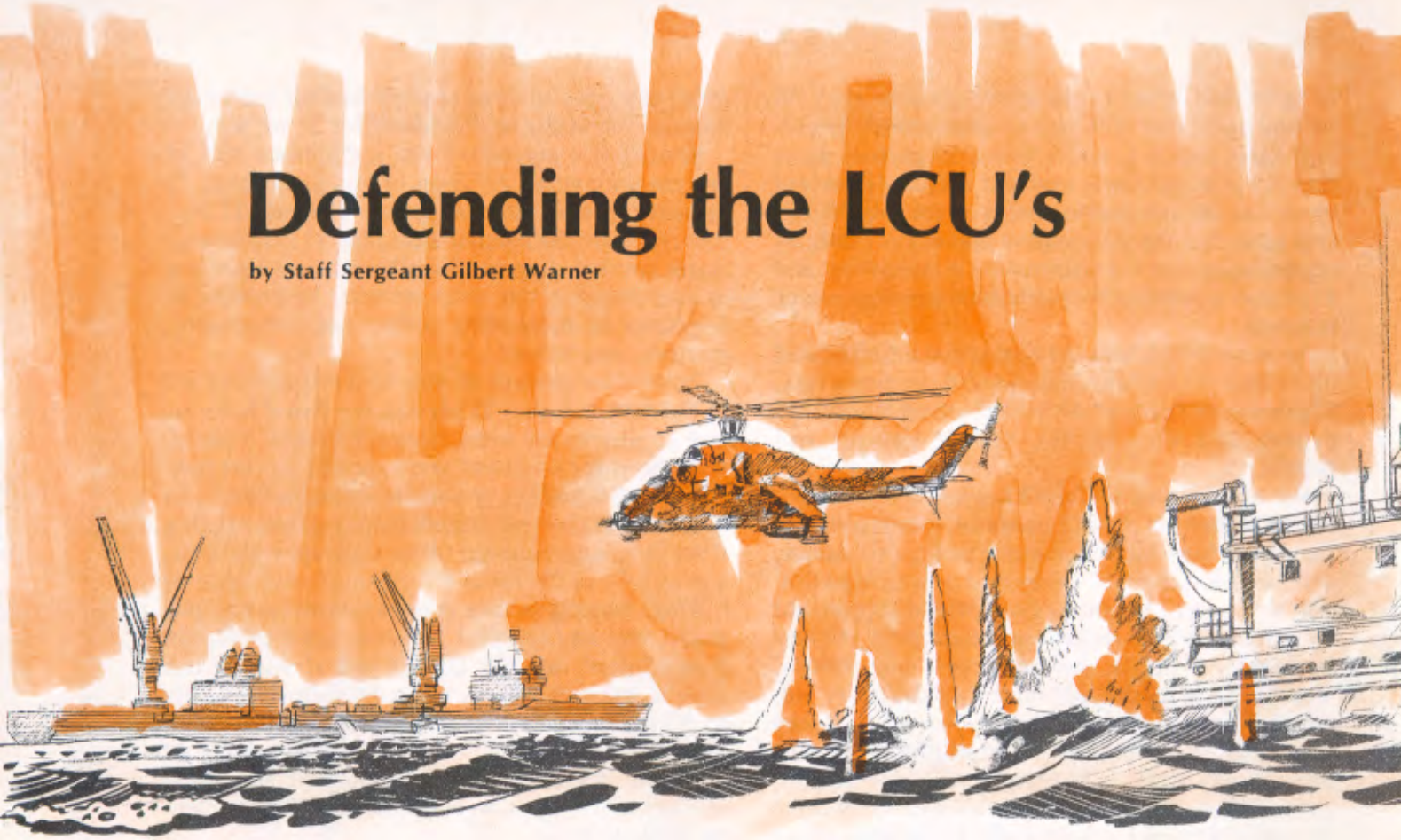
Seventy-eight percent of you stated that you provide a logistics support function; 48 percent of you indicate that you execute that function from a staff position. The second largest group of you (36 percent) gave specific job assignments.

On the survey form, we assured you anonymity and asked for your candid comments. You responded admirably, and your written comments are as helpful to us as the statistical data you provided. In the next issue, we will address some of your written comments and respond to many of the questions you posed.

One point became very clear from the many questions posed in the written comments—you are interested in the "inner-workings" of your *professional bulletin* and would like to know more about it. I hope the article we plan for the next issue, addressing your questions and comments, will give you a better insight in how *Army Logistician* comes to be. Another point also became clear: many of you seemed reluctant to communicate your questions and comments directly. Don't wait for a reader survey to tell us what you think or feel. A letter or phone call from you with a question or comment is welcome at any time. We are always interested in your view of how we can better serve your logistics information needs. Again—thanks for responding to the survey. **ALOG**

Defending the LCU's

by Staff Sergeant Gilbert Warner



Weapon systems for the Army's landing craft, utility, may not provide adequate defense against future threats.

In the old war game "Afrika Korps," one of the rules is that any unit without a clear logistics chain cannot attack and, after so many turns, is eliminated from the game. A review of military history shows that good supply channels are needed not only to win games but also to win wars.

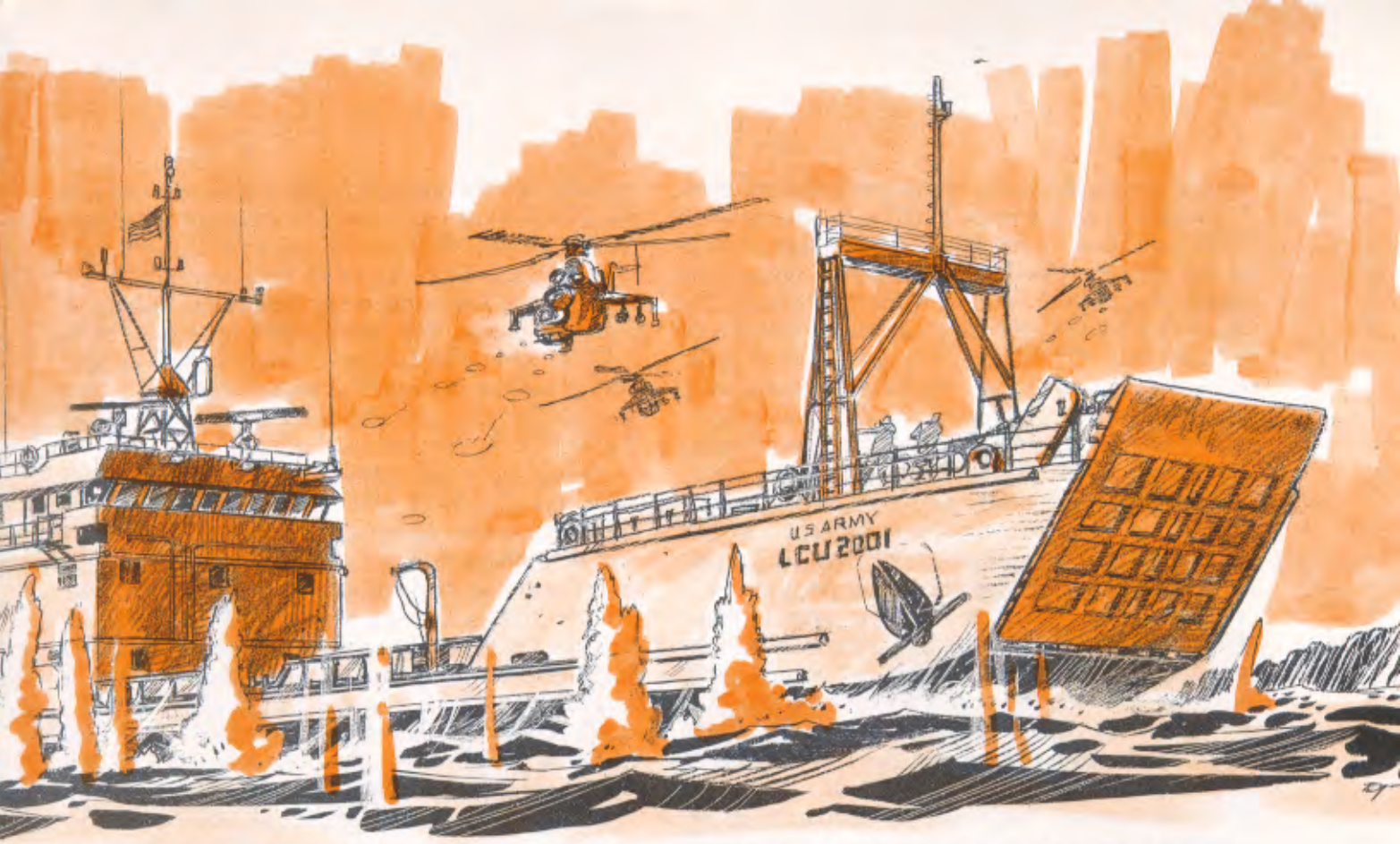
Transportation assets need to be defended or the logistics chain falls apart. But how is this best accomplished? Combat-capable assets are frequently used as escorts, so they may not be available when the enemy arrives on the scene. The only personnel who definitely will be there to defend a transportation asset are those who operate it. Each transportation asset should be examined to determine how an enemy could attack it and how best to defend against such an attack.

For example, let's take the Army's landing craft, utility (LCU), class of watercraft. The LCU is a medium-sized landing and cargo vessel. There are three types in service: classes 1466, 1646, and 2001. In general, they are capable of carrying between 120 and 320 tons, are 120 to 170 feet long, and cruise at speeds of 9 to 12 knots over distances of 1,000 to 2,000 miles. They are designed to land cargo on beaches. They can operate on rivers, between islands, and, depending on the weather, on open seas.

The LCU operates in four basic environments—ports, logistics-over-the-shore (LOTS) operations, open water, and narrow waters. These environments can be modified by weather and light conditions.

The first environment, a port, is a resupply, refuel, repair, recuperate, and do-the-paperwork area. If the LCU is kept busy, it will spend little time at port. A port may be simply a tent city on a beach, a "mother" ship at anchor, or a fully equipped shipyard. It may be collocated with a LOTS operation at a more elaborate installation. A port is relatively immobile and hard to hide, so an enemy will probably know where it is.

The second LCU environment is in a LOTS opera-



tion, which is like a two-ring circus in the middle of a waterway. It is the connection between land and sea. Supplies are concentrated here before being dispersed. In the LOTS area one can usually spot one or more freighters, other LCU's, and a nearby destination for cargo. If the LOTS operation is near a port, the enemy will consider it a prime target. Defense for the major assets is enhanced if all minor vessels can defend their zones.

The third possible LCU environment, open water, includes broad bays, estuaries, straits, and water lying between islands. An LCU in these locations is far enough from land to have little chance of engagement with shore-based weapons.

On the other hand, rivers and creeks are examples of narrow waters where the threat of confrontation with the enemy is greater. In narrow waters it is difficult for the LCU to maneuver, and it may be impossible to turn around. Even if other vessels accompany the LCU, they may not be able to support each other due to bends and turns in the water route that hamper visibility.

There are several possible threats that can occur in each of the four operating environments. Some threats are present everywhere, and some are likely only in one of the four areas. The threats fall into four major categories—ambush, patrol craft, air attack, and mines.

Ambushes are confined primarily to narrow waters where LCU's spend more than half of their time. In Vietnam, an ambush frequently took the form of 10 to 15 positions on the shore or a command-detonated mine, or a combination of the two. The ambush area would be along a riverbank about 200 meters long and 2 deep. Every fourth or fifth weapon was a recoilless rifle or RPG rocket, and the rest were various automatic types. Fire was concentrated on the wheelhouse and conning towers of the vessel. Because maneuvering room was scarce, the boat had to be able to fight its way through. To do this, it had to gain fire superiority as quickly as possible.

To make a Sagger gunner duck before his missile can hit, or to suppress machinegun or recoilless rifle fire, the LCU needs to cover large areas with rapid fire. If one bullet can be fired into every square meter of the ambush site, or if 1 or more square meters can be included in the casualty radius of an explosive, the enemy should go for cover. The more bullets fired into that area, the better. A machinegun like the .50-caliber M2 or the 7.62-millimeter M60 can cover that 200- by 2-meter ambush area in 40 seconds. But the enemy can do a lot of damage in 40 seconds. The M19 automatic grenade launcher could cover the area in 15 seconds. The 5.56-millimeter minigun, at 10,000 rounds per minute, can cover the same zone in 2 seconds; or 5 rounds can be fired into each square meter in 12 seconds. This

should be enough to drive the ambushers under cover.

Surface craft are more likely to be encountered in disputed waters, usually between islands, such as in the Aegean, North, and Caribbean Seas, or in straits such as those between Cuba and Florida. The Soviet Union has sold or given away hundreds of Komar, Osa, "P," Turya, Poti, and Stenka classes of high-speed patrol craft. Armed with various cruise missiles and four 30-millimeter automatic cannons in two turrets, these descendents of the old PT boats can attack any target that they can locate by radar, low-light-level television, or the Mark I eyeball.

The threat posed by these boats may be considered in two categories—gunnery and missiles. To successfully engage in a gunnery duel, you must have equal or greater weight of shells and equal or better firing accuracy. Range is vital. If your weapons cannot at least match the enemy's range, he will merely stand out of range and pound you to pieces. An LCU is not fast; it cannot outrun the enemy. It cannot shorten the range if the enemy does not allow it. If your aim is better than the enemy's at equal range, you may be okay, but you must assume the enemy can aim as well as you. If that is true, it comes down to whose shell will penetrate a vital spot first. The heaviest shell will do more damage, but the smallest weapon will fire more rounds and make more hits. It is a gamble, and you don't want the enemy to be eager to risk it.

The cruise missile component of armament can be considered a low-level, kamikaze, air threat. There are various ranges of weapons that could be used to defend the LCU against this air threat, just as there are various ranges at which attacking aircraft may fire or release munitions. Shooting down the bomber after it has dropped or fired is mere revenge. The idea is to hit the aircraft before it has a chance to fire. The attacker is vulnerable to the .50-caliber machinegun only in a lay-down type of attack, and then only for 3 to 5 seconds. The .50-caliber is not, therefore, a credible threat to aircraft. The 30-millimeter cannon, however, can start firing before the threat reaches its release point. The longer the range of the weapon, the more time there is to hit and damage the aircraft. Similarly, for the cruise missile threat, it is not enough to knock out the target seeker; the missile must be damaged enough to make it aerodynamically unstable so that it crashes, breaks up, or explodes.

It should be pointed out that an LCU sailing in company with other vessels or engaged in a LOTS operation is part of the defense for larger, more important vessels. If a couple of LCU's are lost while successfully defending a freighter, the defense has won. If the freighter is lost, the whole operation may be for naught. Effective antiaircraft capability requires positioning LCU's so they can engage attackers long before the major vessels can be hit. An unarmed cargo ship surrounded by six to eight LCU's, each with a 3- to 4-kilometer engagement range, is probably better protected than one with a 5- to 6-kilometer self-defense range and surrounded by LCU's, as they are now armed.

If a gunnery type system is to be used, it would seem that the LCU needs a weapon of about 30 millimeters with a range of 3 or 4 kilometers. It could handle both surface and airborne threats. It would be as heavy as those most attack boats carry and could hit aircraft before they could fire. It must be pointed out that many navies are choosing the 76-millimeter autocannon, although that requires a larger share of the allowed weight than an LCU could afford. Another option might be a missile that could be used in both roles. The Swedish RBS 70, a long-range missile, might be one to consider. The Hellfire and the Israeli-improved TOW could be used against surface targets and possibly helicopters, but a backup would be needed for the high-speed bombers. There are also turrets available that combine guns and missiles, like the FMC Blazer.

The fourth threat, mines, must not be underestimated. During the last 2 years of World War II, mines destroyed half of the Japanese vessels under 1,000 tons that were lost. Most of England's losses in the Channel area were from mines. At that time the only way to find out if there were mines was to send someone out or sweep and see if you caught anything. Today, mines are capable of delivering themselves to an area and lying in wait for weeks before homing in on a target. Aside from these highly sophisticated types, the range includes contact, command-detonated, magnetic, acoustic, and influenced types.

The good news is that there are now mine-hunting sonars available in sizes small enough to be deployed on a Zodiac rubber boat, such as the Mark 24 underwater ordnance locator. More sophisticated types are available that are light enough for one person to lift out of the water. Resolution is claimed to be so good that objects on the bottom can be identified as junk or mines. In practice, if it looks like it could possibly be a mine, it is either avoided or destroyed with a small charge.

What weapon systems will fit on board the LCU? After all, the LCU is designed to transport cargo, not to fight battles. The New Jersey class of battle-

	Option 1	Option 2
Aircraft and surface craft threat	Oerlikon-Burhle AO3-3, 30-millimeter twin gun on GCM-A mount **2.09 tons**	RBS-70 surface-to-air/surface-to-surface missile, two launchers and 20 reloads **.75 tons**
Close threat	G.E. M214, 5.56-millimeter minigun, 10,000 RPM*, two with 5,000 RPG** **.22 tons**	G.E. Sea Vulcan 20, 20-millimeter system, 1,500 RPM* cyclic, two with 1,000 RPG** **1.35 tons**
Radar and laser lock-on warning equipment (weights approximate)	AN/APR-39A(V) radar warning system; AN/AVR-2 laser detector **.06 tons**	HWR-2 radar warning receiver; Racal Radar Defenses, Ltd. **.02 tons**
Mine detection sonar	Marconi small ship's sonar; Marconi Underwater Systems, Ltd. **.33 tons**	Klein Mark 24, underwater ordnance locator/detector **.07 tons**
Chaff launcher and decoy	Raffael short-range chaff rocket launcher **.02 tons** **Total 2.72 tons**	Raffael short-range chaff rocket launcher **.02 tons** **Total 2.21 tons**

*RPM - rounds per minute **RPG - rounds per gun

Lower weight defense systems, such as the combinations shown above, could be used to defend the LCU.

ships devote 13 percent of displacement to armaments. That does not include the electronics and the considerable weight of armor. At present, less than .07 percent of the displacement of a 1646 class LCU is used for defensive gear. Compared with a logistics support vessel (LSV), that is good—they have only .02 percent devoted to weapons. Even with cargo, it should be reasonable to devote 1 percent of the total displacement to defense. For LCU's, 1 percent works out to 10 tons for the 2001 class and 3.6 tons for the two older classes.

The chart above presents a few alternative lower-weight defense systems that can be used on the LCU. Forewarned is forearmed, so radar and laser warning systems should be considered. These systems can give warning if someone is targeting the vessel with radar. Infrared and laser detection can also be used. Mine detection gear allows each vessel to check its own route and reduces the workload of the Navy's sweepers. In an emergency, and in the absence of dedicated mine warfare vessels, Army vessels could be tasked to clear ports.

The most difficult part of arming the LCU is finding a place to put the weapons. On the 1466 and 2001 classes there is plenty of deck space that is not used for cargo. The 1646 series only has room for one 30-millimeter turret located on top of the deckhouse. If it requires part of the magazine and mechanism to be below the turret, one of the commode spaces in the head must be sacrificed! A single turret is cheaper and lighter and requires no director, but it also leaves a blind spot. Two separate mounts can double the amount of damage inflicted, compensate for malfunctions, and cover all sectors, although not with the same firepower. A director can be used to coordinate the fire of the gun turrets remotely or both weapons can be controlled locally. It definitely would be worthwhile to fit one on the larger LCU where as many as four turrets could be carried inside the weight limit.

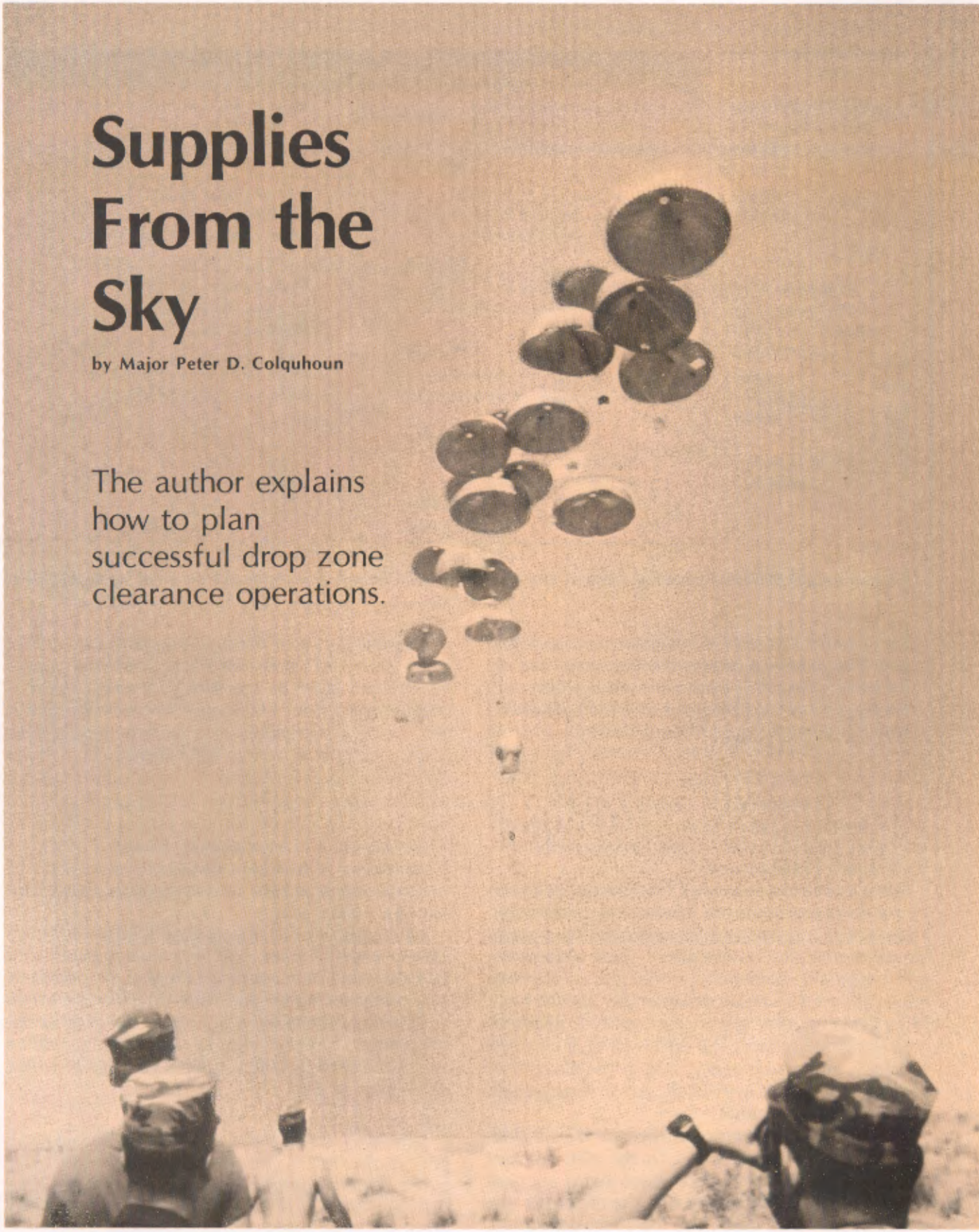
An analysis of this nature should be run for each type of logistics asset. It is time we consulted with the troops and found out what types of environments they really encounter and what they need to effectively defend themselves and our assets in those environments. Supply is the key to winning, but we must be able to fight the supplies through to where the victory is won. ALOG

Staff Sergeant Gilbert Warner is assigned to an LCU in the 329th Transportation Company, Fort Eustis, Virginia. He has served as the skipper of an Army landing craft, mechanized. He attended Utah State University and the University of Maryland.

Supplies From the Sky

by Major Peter D. Colquhoun

The author explains how to plan successful drop zone clearance operations.



For the combat force, airdropping ammunition, fuel, and rations is just the first step in supplying troops at the front line. Army riggers and Air Force personnel have done their part, but as the first A22 container hits the ground, the job of distributing the combat supplies has just begun.

As force reductions continue and fewer units are forward-deployed, we are being directed toward highly deployable light and airborne forces. These forces do not have the ability to carry the quantities of combat supplies and replacement items that the heavier forces do. This places greater emphasis on the responsiveness of the supply system. Resupply to these forces may be required when the theater is not developed and the resupply system is in its infancy.

To help meet these demands, the Army has positioned, at various locations worldwide, limited stocks of selected combat supplies that are prerigged for airdrop in A22 container delivery systems (CDS's). For units such as the 82d Airborne Division, 10th Mountain Division (Light Infantry), 7th Infantry Division (Light), and others, the ability to operate the drop zone (DZ), successfully clear the DZ, and distribute vital supplies is imperative.

In a number of scenarios, airdrop resupply to the division is accomplished as a number of small airdrops—one to each battalion—on a drop zone that is located immediately to the rear of the battalion's position. However, for those divisions that deploy with their integral logistics capability (forward support battalion [FSB] and other combat service support units), the resupply system may work best by making the airdrop to the FSB. The FSB will receive the supplies on the DZ and then distribute them, using the same system that it will use when the theater begins to mature.

If you are the officer (commissioned or warrant) given the task of operating the DZ, your job will start at least 24 hours before the first load exits an aircraft. Your job may begin when you arrange for the Air Force combat control team (CCT) to survey an open field for use as a cargo DZ (but preferably it will begin even before this). At the very least, it will begin with some serious thoughts about the task ahead of you.

Why should you be concerned? Marking the drop zone is easy—the CCT does it for you, and they will talk to the aircraft on your behalf as well. But recovering 200 to 300 short tons of supplies and the same number of large cargo parachutes can cause headaches, especially if you must do it in the dark. Successful DZ clearance can be ensured by following two basic principles—maintenance of control and effective task organization.

To maintain effective control over a DZ clearance operation, you must establish a DZ control point. It should be on the edge of the DZ, sited so that the DZ commander can observe the operation and all personnel entering and leaving the DZ can report. You must enforce the maxim "one entry point, same exit point." This will enable you to control the key elements—

- Airdropped supplies. You must record the airdropped supplies that have been recovered to determine if the DZ has been fully cleared, or if you need to continue the search for A22 containers. These records will help you maintain accountability for airdropped supplies as well as recovered air delivery equipment.
- Personnel. Control of personnel is particularly important because the DZ must be cleared of personnel and recovery equipment before an airdrop can take place. Accounting for personnel is difficult over a dispersed area, especially at night.
- Equipment. The speed at which the DZ is cleared is determined by the effective use of available equipment. Failure to plan the use of equipment will result in duplicated effort, idle equipment, and other inefficiencies.

Effective task organization requires that the task be broken down into a number of manageable activities, each of which can be accomplished by a small team. Each team must be assigned a specific area on the DZ in which to work. This will ensure that the operation of one team does not interfere with the operation of another team.

You need to designate parachute recovery teams and forklift teams. Each parachute recovery team consists of three men who determine the type of commodity inside the container by reading the documentation or external color-coding on the container (if color-coding is used). Team members mark the containers so forklift teams can identify the contents from a reasonable distance. They also disconnect a parachute from its load, collapse the canopy, and stow the parachute in its bag so it is ready for pickup on the DZ. Each forklift team consists of one forklift operator and two men who load the A22 containers onto trucks at the DZ.

You must consider the relationship of the DZ to the rest of the commodity distribution system. You should effectively integrate the DZ into the front of the system so that, aside from the DZ, nothing else in the way you handle and distribute commodities is changed.

An aircraft airdrops supplies using A22 container delivery systems.

A model drop zone layout.

The chart above suggests one layout approach. The size of your DZ must be in accordance with that prescribed in Military Airlift Command Regulation 57-1. For large scale airdrop, the DZ must be at least 600 by 1,000 yards. The surface area of the DZ must be able to support the movement of forklifts and trucks that are required for DZ clearance.

Other factors to consider when planning your layout for DZ clearance operations are—

- A holding area for trucks, which should be located near the DZ control point.
- Storage areas, which should be arranged by commodity groups and item types near the DZ so aircraft will not fly over them when approaching and exiting the DZ.
- A salvage point, usually located near the DZ off the main circuit, which should be set up to store recovered airdrop equipment for return through the salvage system.

To clear the DZ, each truck is moved from the holding area to the DZ control point, where it is directed to a specific forklift team. At the DZ, airdropped supplies and parachutes from the A22 containers are loaded onto the truck. The truck is then moved back to the control point. (A second truck is moved to the DZ for loading.) From the control point, the truck is moved to the salvage area, where the parachutes are offloaded, and then to the appropriate commodity storage areas for unloading. The truck is then returned to the holding area.

At each commodity storage site, the A22 containers are derigged and the supplies are stacked in the storage areas. The containers are returned later to the salvage area.

If supplies are airdropped when the wind velocity is greater than 8 knots, parachutes remain inflated and make recovery operations more difficult.

So far you have developed a general concept for clearing the DZ and taking control of the supplies, but this will not turn into a plan until you can determine the resource requirements necessary to get the job done. To compute your requirements, use the benchmark work rates of 4 cargo parachutes per hour (1 every 15 minutes) for the recovery team and 12 A22 containers per hour (1 every 5 minutes) for the forklift operators.

Assume that at the DZ you have 1 team recovering parachutes and 1 forklift team loading A22 containers, and you receive 250 A22 containers. You can compute the hours of work required by your recovery team by dividing the number of containers (250) by the benchmark work rate for the recovery team (4 parachutes per hour), which yields 62.5 hours of work. To compute hours of work for the forklift team, divide 250 by the team's benchmark (12 containers per hour), which yields 20.8 hours of work.

Suppose the tactical situation requires the DZ to be cleared in 4 hours. You will need to identify the DZ clearance resources necessary to achieve this mission. You can determine the number of recovery teams required by dividing 62.5 (the hours of work required for one team to recover 250 containers) by 4 hours, which yields 15.6, or 16, teams. Compute the requirement for forklift teams by dividing 20.8 (the hours of work required for one team to load 250 containers) by 4 hours. The result is 5.2, or 6, teams. So you will need 16 recovery teams and 6 forklift teams to clear the DZ of 250 containers in 4 hours.

In addition to team requirements, the number of trucks needed to clear the DZ must also be determined. You can get the transport officer to do this or you can calculate the requirement by determining the amount of time that is required for each truck to be loaded at the DZ, unloaded at the salvage and storage areas, and driven back to the DZ.

Suppose you determine that—

- An A22 container can be loaded onto a truck in 5 minutes.
- Each truck can carry four containers so the loading time for each truck is 20 minutes (5 minutes per container multiplied by four containers).
- Four parachutes can be unloaded from a truck at the salvage point in 5 minutes.
- Each truck can be unloaded at the storage areas in 20 minutes.
- The time that is required for a truck to be driven the complete circuit and returned to the DZ is 20 minutes.

Using the sum of the above (65 minutes) for the DZ cycle time, you can compute your truck requirements. Suppose you are using one forklift team and must ensure that one truck is at the DZ at all times. You can determine the truck requirements by dividing the DZ cycle time (65 minutes) by the loading time on the DZ (20 minutes), which yields 3.25, or 4, trucks. Further, suppose that you are using six forklift teams and must ensure that six trucks are at the DZ at all times. Truck requirements are computed by multiplying 6 times 3.25 (trucks), which yields 19.5, or 20, trucks.

The figures used above reflect night operations under a full moon, clear sky, calm wind conditions, good terrain, and moderate temperatures. If you are operating under different conditions, make some common sense adjustments to the work rates. Perhaps the only difficult adjustment is for wind. It inflates the parachutes and makes recovery difficult. If the predicted wind is over 8 knots, you should increase your parachute recovery teams by at least one man and use a work rate of 3 parachutes per hour.

There is no substitute for experience, whether you are clearing drop zones or doing other military tasks. I hope that I have provided enough information to allow you to look at drop zone clearance operations and identify a starting point for your plan. Remember, the drop zone is the beginning of your division's resupply—not the end of it. **ALOG**

Major Peter D. Colquhoun is the commander of the Australian Army Component of Air Movement Training and Development Unit, Royal Australian Air Force Base Richmond. When he wrote this article, he was a captain assigned as the Australian Army exchange instructor at the Airborne and Field Services Department, Army Quartermaster Center and School, Fort Lee, Virginia.

Low-Intensity Logistics in the

Logisticians supporting an exercise in Australia learned a new set

On 26 July 1989, Task Force Catamount, a light infantry task force of 1,000 soldiers from the 25th Infantry Division (Light) at Schofield Barracks, Hawaii, deployed to Darwin, Australia, for an exercise. The scenario for this exercise, Kangaroo '89, called for the task force to fight a low-intensity battle alongside our Australian ally for 25 days in the remote, arid "outback" of Australia's Northern Territory.

The maneuver area the ground troops covered was 4,000 kilometers across and equaled the combined size of Montana, North Dakota, and South Dakota. Temperatures reached above 97 degrees Fahrenheit during the day and dipped as low as 36 degrees at night. To further challenge the troops, the exercise took place in the dry season. No rain fell in any part of the maneuver area during the exercise.

The task force's logisticians knew that the exercise would be a great test of sustainment operations in a low-intensity environment. What they learned was that the traditional elements of mission, enemy, terrain, troops, and time available (METT-T) did not provide all of the planning factors needed for operating in the Australian hinterland in the dry season. In this exercise, the factors of distance, dust, critical asset security, and water ("DDCW") were just as important.

All soldiers have been taught that METT-T encompasses almost every consideration a commander requires in developing a solid plan or order; but "DDCW" became the real "buzzword" for those developing the support plan for each mission during this exercise. Although examined from a logistics standpoint in this article, "DDCW" affected tactics as well as logistics.

Distance

Tactical deployments within the area of operation routinely exceeded 100 kilometers and reached a maximum of 340 kilometers. Units commonly operated over 70 kilometers from the task force headquarters. Because operations were so dispersed, AM radios were needed to communicate from company to battalion and between battalion and the Australian brigade headquarters to which the task force was attached. Radio relay and retransmission sites were used regularly. Because of the relative flatness of the terrain, FM radios coupled to OE254 antennas often transmitted as far as 50 kilometers.

The great distances involved dictated that injured

☐ **The dispersed nature of the exercise meant that aircraft had to be supported by decentralized forward-area refueling points.**

'Outback'

by Major John O. Innes

of planning factors: distance, dust, critical asset security, and water.

or sick personnel be evacuated by air whenever possible. In the event that utility aircraft might not be available for medical evacuation to the battalion surgeon, senior medics, trained as emergency medical technicians, were positioned well forward with ambulances.

Aviation assets were decentralized in elements of three to five aircraft each so that the task force could pursue an enemy fleeing over the great distances. While successful in enabling combat troops to react immediately, these small detachments had to be supported by decentralized forward-area refueling points. This decentralization of fuel resupply meant that aviation fuel and fuel handlers had to be closely supervised—something that is usually not a worry for a battalion S4.

Decentralized aviation assets also increased flexibility in resupply operations. However, alternatives had to be ready in case maintenance needs or higher priority missions took aircraft away from the resupply mission. Each ground vehicle therefore carried extra water (25 gallons) and fuel (the equivalent of 1/2 tank in 5-gallon cans) to meet emergencies and preclude the possibility of stranded vehicles. Units in the field carried a 1-day supply of emergency rations to sustain soldiers if aerial resupply did not succeed.

Operating over great distances typically increases maintenance requirements. To eliminate problems, strict maintenance checks were performed on each vehicle before any long moves were undertaken. These checks included examining wheel bearings and cleaning or changing air filters. An inspection station was activated in the combat trains area and each vehicle was inspected within 24 hours of any long convoy movement. Many potential breakdowns were avoided because of these procedures.

Dust

An arid environment like the outback means that dust will be a constant concern, particularly for maintenance. As noted already, fuel and air filters were cleaned when possible and changed as needed. Lubricants were used in greater than normal quantities.

Dust also affected the maintenance of aircraft. For example, 60 main rotor pitch-change-link rod-end bearings had to be changed in only 650 hours of flying.

A soldier cools off in an "Australian shower."

The combination of dust and heat also created a personal hygiene problem. Unit leaders had to ensure that soldiers were provided with bath facilities. Several alternatives were used: a stream bath (crocodile guards were required); an "Australian shower" (a canvas sack with a shower head hung from a tree); and, when possible, a field bath unit.

Dust had an equal impact on tactical operations. It did not rain during the entire exercise; indeed, it has not rained in the Northern Territory in the month of August in all of recorded history. As a result of the very dry conditions, any moving ground vehicle created a cloud of dust when it left the paved roads. Convoys of moving vehicles created massive dust clouds visible at distances of over 70 kilometers to a naked-eye observer aboard an aircraft.

Crocodiles typified the natural challenges faced by soldiers operating in the outback.

Critical Asset Security

Many task force assets were critical and required protection. Loss of water, fuel, or maintenance assets would have devastated any mission. However, because the lack of a definitive front line created a fluid situation and dispersed tactical operations, combat soldiers could not be withdrawn to secure each vital asset.

We learned that combat support and combat service support soldiers must be prepared to do double duty in protecting critical assets. They must pace themselves throughout each day, remain skilled in the use of night-vision and intrusion-detection systems, and provide continuous, around-the-clock security while still performing their support missions.

Water

Always a consideration, water becomes critical when soldiers carry heavy loads over extended distances and the temperature is consistently in the high 90's. During this exercise, soldiers never started a mission with less than 4 quarts of water and routinely carried 6 quarts. Each unit also had an immediate resupply of 150 gallons on hand. Water blivets of 250- and 500- gallon capacity and pumps were positioned to ensure that clean water was available. Not including water used for food preparation, the task force consumed an average of 9 quarts of water per man each day.

In the outback, as in most desert environments, potable water is not readily available. Water purification is therefore a requirement and purification assets become critical. Whether the equipment is mobile or stationary, careful consideration must be given to ensuring that security is provided for water blivets, pumps, and tank trucks at all times. Antitank vehicles with automatic weapons can provide convoy security in a low-intensity environment.

Fighting in the outback for a prolonged period provided many challenges not encountered in traditional training exercises. Probably not since World War II have American troops encountered a realistic, low-intensity enemy over so immense a terrain while experiencing such variations in daily temperature.

Water resupply; increased expenditure of repair parts; increased vehicle inspections; security of critical assets; communications over extended distances; resupply and manning of aviation refueling points; the need for on-vehicle reserves of water, fuel, and food: all these provided challenges for the logistics planners of Task Force Catamount. Although METT-T remains very important, those who have faced the challenges of fighting in the Australian outback will never forget the factors of "DDCW" that supplemented METT-T in planning and developing the support plan for every operation. **ALOG**

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Painting for Desert Shield

by Marion E. Dilley

The beginning of Operation Desert Shield last August brought a challenging order to Fort Hood, Texas: Repaint all equipment deploying to Saudi Arabia from a woodland green to a desert tan color scheme using a chemical-agent-resistant-coating (CARC) paint.

In undertaking the painting operation, Fort Hood faced several problems. While painting facilities appeared adequate—each major unit on post had approved CARC paint booths and the maintenance division of the installation directorate of logistics (DOL) had four booths—the units possessed limited skills in applying CARC paints on tactical equipment. Additional personnel would be needed to sustain such a large-scale painting operation. It was also difficult to determine the amount of paint required to paint the equipment of an armored division. But the major obstacle was obtaining sufficient quantities of CARC desert tan paint to do the job.

Initial contacts with the U.S. Forces Command (FORSCOM) and Army Materiel Command (AMC) headquarters were not promising. AMC was able to provide only 5,500 gallons of paint from Red River Army Depot, Texas. Telephone calls from Fort Hood to other AMC activities and FORSCOM installations were fruitless: No one had sufficient quantities of desert tan paint available.

Fort Hood needed a central point to pull together unit paint requirements and make consolidated procurements for the entire installation. The DOL maintenance division therefore was designated to procure and distribute paint and coordinate the work. The initial requests for CARC tan paint made through the wholesale supply system could not be filled by the General Services Administration (GSA), so other sources of supply were developed. The supply of 5,500 gallons of paint from Red River Army Depot was consumed in less than a week. Eventually, working with GSA and coordinating directly with manufacturers, deliveries of paint started. But even with an expanded procurement base, the Army was consuming CARC paint faster than industry could produce it.

Each major unit with a paint facility was tasked to paint a brigade's worth of equipment. DOL painted the equipment of all nondivisional units. Soldiers accompanied their equipment to assist in painting. All painters and helpers had to get medical clearances before using CARC materials. Civilians were trained to help, and additional painters came from Red River Army Depot. Without the support of civilian employees and military personnel working together, Fort Hood could not have succeeded in this endeavor.

The schedule called for painting 24 hours a day, 7 days a week. Under normal conditions, 8 to 10 hours are needed to paint one M1 Abrams tank in a full camouflage pattern. However, the demands of Operation Desert Shield called for a faster pace. The paint lines moved slowly at first, but—after working with safety, environmental, and preventive medicine personnel—DOL was able to expand painting operations to well-ventilated outdoor locations. The average time to paint one tank was reduced to approximately 30 minutes, and all health and safety requirements for using CARC materials were observed. As each piece of equipment was painted, it was moved to a curing area in the sunshine.

Continuous lines of vehicles formed at all paint booths. At one point, Fort Hood was using 1,200 gallons of paint a day. Daily contacts with GSA continued to ensure that there was enough paint to maintain the schedule.

By the end of August, approximately 5,000 pieces of equipment had been painted. In the first week of September, the 2d Armored Division reported that all deployable equipment was painted. The 1st Cavalry Division was able to file a similar report shortly thereafter. Almost all deployable equipment at Fort Hood had been transformed from green to tan by the end of September.

The repainting project required 37,000 gallons of paint to convert over 16,000 pieces of equipment from green to tan. As a result, deploying units went to Saudi Arabia with their equipment ready to operate across desert terrain. ALOG

Marion E. Dilley is the shop operations manager for the maintenance division, directorate of logistics, Fort Hood, Texas. He holds bachelor's and master's degrees in management science from American Technological University in Texas.

ALOG DIGEST

NEW SYSTEM ASSISTS DEPLOYMENTS

Operation Desert Storm has provided the opportunity for another Army first. For the first time, the Army's transportation coordinator automated command and control information system (TC ACCIS) has been used in a deployment.

TC ACCIS has been fielded to 25 of the 46 continental United States (CONUS) mobilization stations that will eventually receive it. The mobilization stations have used TC ACCIS to manage the movement of deploying units to their ports of embarkation. TC ACCIS has provided invaluable support in deploying CONUS units, even though the system is undergoing further development. When TC ACCIS is fully developed and fielded, it will perform approximately 50 transportation functions.

Unit movement personnel have used TC ACCIS to develop and update deployment equipment lists, rail load plans, and convoy movements documentation. Installation transportation offices have used the system to determine commercial lift requirements, generate bar-code shipping labels, prepare Government bills of lading, and provide unit movement data to Forces Command and the Military Traffic Management Command.

The success of TC ACCIS in CONUS led the Army in November to send a downsized version of the system to Germany for use in the second phase of the Desert Storm deployment. The Army also plans to deploy TC ACCIS to Saudi Arabia.

ARMY STUDIES WATER EQUIPMENT

The Army Materiel Readiness Support Activity (MRSA), Lexington, Kentucky, has developed recommendations for improving use of water equipment in the desert. MRSA was tasked by the Army Materiel Command last year to conduct a special study to evaluate the performance and logistics supportability of water equipment used in the desert. After equipment items were tested, MRSA forwarded its recommendations to the Defense Department's water resources management action group (WRMAG). The WRMAG, which is made up of representatives from the four services and Defense agencies, was established to coordinate and resolve joint water support issues.

The MRSA study recommended that the raw-water pump and booster-pump components of the 150,000-gallon-per-day reverse osmosis water purification unit (ROWPU) be replaced with a more efficient pumping system. A 350-gallon-per-minute water pump has now been installed on the ROWPU's, including those that were sent to Saudi Arabia.

The study recommended that a smaller evacuation device be used on the tactical water distribution system. The device, which resembles a toy ball, was too big to pass through the end coupler. The ball has been replaced by a smaller one that moves easily through the system.

Other recommendations were to use a standard valve stem on the 3,000-gallon tank, known as an onion water tank, for system compatibility; to replace 3/4-inch drain valves with 2-inch valves for faster draining in the 20,000- and 50,000-gallon water storage bags; and to change towing specifications and first-article-test requirements, including off-road operation for the new thin-skinned, 500-gallon, collapsible, fabric drums.

For copies of the MRSA report, write to—Army Materiel Readiness Support Activity, ATTN: AMXMD-ED, Lexington, KY 40511-5101, or call Rosemary Boblenz, AUTOVON 745-3170 or commercial (606) 293-3170.

COMMAND CONSOLIDATES OPERATIONAL TESTING

The Army has created a new command to supervise all of its operational test and evaluation activities. The action was taken to comply with a Defense Management Review decision directing the Army to consolidate administration of its testing and evaluation. The new Army Operational Test and Evaluation Command (OPTEC), activated last November and headquartered at Alexandria, Virginia, is a field operating agency of the Army Chief of Staff.

OPTEC combines the Army Operational Test and Evaluation Agency (renamed the Operational Evaluation Command) and the Test and Experimentation Command (TEXCOM), previously part of the Army Training and Doctrine Command (TRADOC). TEXCOM headquarters remains at Fort Hood, Texas. OPTEC also includes the Army Development and Acquisition of Threat Simulators Activity (now called the OPTEC Threat Support Activity) at Fort Bliss, Texas.

OPTEC incorporates the former TRADOC test boards. Four of the boards will be closed in the next few months and their missions transferred to TEXCOM headquarters: the Infantry Board at Fort Benning, Georgia; the Armor and Engineer Board at Fort Knox, Kentucky; the Aviation Board at Fort Rucker, Alabama; and the Communications-Electronics Board at Fort Gordon, Georgia. The Airborne and Special Operations Board at Fort Bragg, North Carolina, and the Air Defense Artillery Board at Fort Bliss will become TEXCOM directorates but will remain in their current locations. The Intelligence and Security Board at Fort Huachuca, Arizona, and the Field Artillery Board at Fort Sill, Oklahoma, will function as TEXCOM directorates until their permament status is determined.

The activation of OPTEC will significantly reduce the overhead costs of the Army's operational test and evaluation program. The functions of the Operational Evaluation Command and TEXCOM remain essentially unchanged.

MANPOWER AND FORCE MANAGEMENT PROGRAM JOINS ACTEDS

Late last year the U.S. Total Army Personnel Command, Alexandria, Virginia, approved a career plan for the 1,900 civilians in the manpower and force management career field. This was the eighteenth career program plan approved under the Army civilian training, education, and development system, better known by its acronym, ACTEDS. Each plan is designed to act as a roadmap for civilians' technical, professional, and leadership training following a system similar to that used by the military.

Although not "hard-core" logisticians themselves, manpower and force managers assist logisticians involved in developing doctrine, equipping the force, and designing combat service support organizations for maximum combat effectiveness.

ACTEDS plans have been developed and instituted for a number of logistics career programs—ammunition management, contracting and acquisition, transportation management, materiel maintenance management, housing management, and commissary management. A plan also has been approved for a logistics specialty that is not part of a career program—executive assistant for base operations (also known as garrison manager). ACTEDS plans will soon be distributed for civilians working in the areas of quality assurance (ammunition surveillance), supply management, and education.

Copies of the manpower and force management plan, or any plan developed thus far, are available from career program managers, from stateside civilian personnel offices (CPO's) through the automated training resource access information network, and from oversea CPO's on floppy disks.

☐ Door gunner, PFC Ken Clary, and crew chief, PFC Ronnie Milhouse, Company D, Aircraft Maintenance Company, 82d Aviation Brigade, pull maintenance on their UH-60 Black Hawk helicopter. Aircraft maintenance is a critical element of readiness in Operation Desert Storm. Engines are being changed more frequently because of the damaging effects of sand. Keeping aircraft components clean and operational is a particular challenge because of the sand carried by the harsh desert winds. To help counteract these conditions, aircraft are washed daily, inlet covers are kept on when aircraft are parked, and landing zones are covered with "perma-prime," which forms a thick, heavy crust on the sand. (Photo courtesy of *Desert Dragon*.)

SUSTAINMENT AND MANAGEMENT UNIVERSITY PLANNED

The Army has begun preliminary planning to establish an Army sustainment and management university (ASMU). The concept for such an institution was approved as a part of Project Vanguard—an Army-wide study of manpower and organizational changes needed to achieve operational economies.

The ASMU will play a major role in educating and training civilian and military members of the Army's sustainment and logistics work force. The university will be aligned under the Army Training and Doctrine Command (TRADOC). TRADOC is tasked with recommending the most effective and efficient organizational structure to assimilate institutions such as the Army Logistics Management College (ALMC), the Army Management Engineering College (AMEC), the Army Management Staff College (AMSC), and a number of smaller schools into the university concept.

The Vanguard study group recommended ALMC as the nucleus table of distribution and allowances organization around which the colleges and schools of the university would be structured.

TROOPS GET COOLER CLOTHING

Modifications have been made to the desert-camouflage battle dress uniform to make it more comfortable for troops serving in Operation Desert Storm. The shirt yoke (the fitted piece at the top of the blouse) and elbow, seat, and knee patches are omitted from the modified design. Additional changes are underway. A fabric lighter than the 50-percent cotton, 50-percent nylon blend currently being used will be tested later this year.

The traditional hot weather boot also has been modified in response to Desert Storm. A thermal barrier has replaced the steel plate to protect soldiers' feet against heat from the desert sand, vent screens have been removed to prevent sand from entering the boot, and the flesh side of the leather has been placed on the outside giving the boot a tan suede appearance. Other modifications include ankle support, a padded collar, and a form-fitting contoured insole.

MAINTENANCE AWARDS ANNOUNCED

The 1990 Army Chief of Staff Awards for Maintenance Excellence were announced by the Office of the Deputy Chief of Staff for Logistics. The winners of the ninth maintenance competition are—

Active Army MTOE Units

Light. 188th Military Police Company, EUSA, Taegu, Korea.
Intermediate. Company A, 39th Engineer Battalion, FORSCOM, Fort Devens, Massachusetts.
Heavy. Headquarters and Supply Company, 3d Battalion, 9th Aviation Regiment, FORSCOM, Fort Lewis, Washington.

Army National Guard MTOE Units

Light. Headquarters and Headquarters Detachment, 109th Medical Battalion, Iowa ARNG, Iowa City, Iowa.
Intermediate. 229th Chemical Company (Smoke/Decontamination), Virginia ARNG, Roanoke, Virginia.
Heavy. Company B, 199th Forward Support Battalion, Louisiana ARNG, Winnfield, Louisiana.

U.S. Army Reserve MTOE Units

Light. Headquarters and Headquarters Detachment, 520th Maintenance Battalion, FORSCOM, St. Louis, Missouri.
Intermediate. 801st Engineer Company (Port Construction), FORSCOM, Oakland, California.
Heavy. 936th Maintenance Company (Direct Support), FORSCOM, Wood River, Illinois.

Army TDA Units

Note: All components competed in one TDA category this year.
Light. 1st Squadron, 322d Cavalry, USAR, FORSCOM, Omaha, Nebraska.
Intermediate. Defense Communications Systems Operations Company, USAISC, Okinawa, Japan.
Heavy. 1st Battalion, 29th Infantry Regiment, TRADOC, Fort Benning, Georgia.

☐ **A soldier with the 18th Quartermaster Company, Special Troop Battalion, 1st Corps Support Command, inventories cases of ready-to-eat meals (MRE's) at a ration distribution point in Saudi Arabia. The number of personnel assigned to the company has more than doubled since the unit was activated in late 1990 to support Operation Desert Shield.**

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ALOG EMPHASIS

(Continued from page 1)

OFFICERS PICK SPECIALTIES

In June, the Total Army Personnel Command, Alexandria, Virginia, will send questionnaires to all year group 1986 officers managed by its officer personnel management directorate. Officers will be asked to state their preferences in up to four functional areas. Functional area designations are assigned to all combat arms officers and most combat support and combat service support officers, although some can remain in a single track within their career branch. Reviews of the officers' responses will be completed in November, and officers will be notified of the results in December.

NCO JOURNAL TO PUBLISH

The Army Noncommissioned Officer Corps now has its own professional bulletin—the *NCO Journal*. The inaugural issue was scheduled for April distribution. The *Journal*'s purpose is to provide a forum for the exchange of ideas and information to support the training, education, and development of NCO's. Master Sergeant Gil High, *Journal* editor, said, "The journal should be a place where NCO's will share their own experiences, ideas, and opinions for the mutual benefit of all NCO's." The *Journal* is being distributed through the Army's initial distribution system and can be requested by filing DA Form 12-99-R with the Army Publications Distribution Center-Baltimore.

AORS XXX ANNOUNCED

The 30th annual Army Operations Research Symposium (AORS) will be held 13 and 14 November 1991 at Fort Lee, Virginia. The Army Combined Arms Support Command and the Army Logistics Management College will cohost the event. Papers are being solicited to support the symposium theme, "Army Analysis—The New Realities." Address inquiries concerning the symposium to—U.S. Army TRADOC Analysis Command—Fort Lee, ATTN: ATRS-LS, Fort Lee, VA 23801-6140, or call AUTOVON 687-3449 or commercial (804) 734-3449.

ASSET STUDIES LISTED

A bibliography of studies on asset visibility is available to authorized persons. Write to—DLSIE, ALMC, Fort Lee, VA 23801-6043, or call AUTOVON 687-4655 or commercial (804) 734-4655.

PACKING GUIDE UPDATED

Revised DA Pamphlet 740-1, Instructional Guide for Basic Military Preservation and Packing, incorporates several changes. It updates methods and materials for preservation, reflects new marking requirements, describes new packaging of electrostatic discharge sensitive items, revises the requirements for FAST PACK containers, and includes information for identification and handling of hazardous materials. The pamphlet provides a series of lessons for training military preservation and packing personnel. (See related article on page 9.)

Coming in Future Issues—

- Knowledge-Based Logistics Planning
- Conquered on the Railway
- AirLand Battle-Future Ammunition Requirements
- Supporting Movement to Honduras
- Logistics Requirements Package
- Readers' Comments
- Testing To Solve Brake Problems
- Contracting Direct Health Care Providers
- Cutting Costs Through Reutilization
- Making the Logistics System More Effective
- Stock Funding of Depot-Level Reparables
- Tires for Desert Use
- Evolution of Rear-Operations Doctrine
- Determining System Reliability
- Data Communications on the Last Frontier
- Change-of-Command Inventory Procedures
- German Army Water Supply Operations

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