

# ARMY LOGISTICIAN

MAY-JUNE 1998



## *Logistics Improvisation*

*Also in this issue—  
Updates on Operation Joint Guard*



# ARMY LOGISTICIAN

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**Disclaimer:** Articles express opinions of authors, not the Department of Defense or any of its agencies, and do not change or supersede official Army publications. The masculine pronoun may refer to either gender.

**Submissions:** Articles and information on all facets of logistics operations and functions are solicited. Direct communication is authorized and should be addressed to: EDITOR ARMY LOGISTICIAN/ALMC/2401 QUARTERS RD/FT LEE VA 23801-1705. Phone numbers are: (804) 765-4761 or DSN 539-4761; Fax (804) 765-4463 or DSN 539-4463; e-mail alog@lee-dns1.army.mil. Articles may be reprinted with credit to *Army Logician* and the author(s), except when copyright is indicated.

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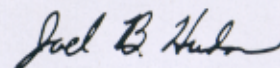
The palletized loading system offers optional configurations for transporting many types of equipment and supplies in various environmental conditions. Sometimes, however, unusual circumstances call for innovative solutions. The article beginning on page 24 describes how a logistics unit improvised solutions while providing logistics support to the light cavalry during the training exercise, Desert Saber.

This medium is approved for the official dissemination of material designed to keep individuals within the Army knowledgeable of current and emerging developments within their areas of expertise for the purpose of enhancing their professional development.

By Order of the Secretary of the Army:

**DENNIS J. REIMER**  
General, United States Army  
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Official:



**JOEL B. HUDSON**  
Administrative Assistant  
to the Secretary of the Army  
04436



## *Coming in Future Issues—*

- Vendor-Managed Medical Supply Sets
- Chemical Warfare Service Prepares for War
- Convoy Support Center in Croatia
- Expedient HET Upload Operations
- A Guide for the Ground Assault Convoy
- Nondivisional CSS Unit Attachments
- Power Sources on the Battlefield
- ULLS Gunnery at the NTC
- The Case for the Theater Support Command
- Movement Control in Europe
- One Force Logistics Training
- Assigned to a Forward Support Company
- Maintenance Company Operations in the ISB
- Modernization of a Class IX Facility

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Official Business



## IRON Not a Repair Standard

Regarding the article, "Understanding Integrated Sustainment Maintenance," by Major David M. Funk, in the January-February 1998 issue, I hate to take exception to what was an otherwise excellent article. However, in at least two instances, the author refers to inspect and repair only as needed (IRON) as a repair standard. IRON is not a repair standard. Repair standards are contained in technical manuals or other such publications. IRON is simply a concept, and a very old one (decades) at that. Maintenance personnel, in my humble opinion, should have been using it all along.

**Don Wheeler**  
Seoul, South Korea

## Prime Vendor Pharmaceuticals

In your January-February 1998 issue, there was a brief article concerning Prime Vendor pharmaceutical supplies. This article addresses one limitation for this service: the pharmaceutical Prime Vendor's computer. Our logistics system does not need another stovepipe system, and in the case of this vendor, that is what we are getting.

Don't get me wrong. I am a big supporter of Velocity Management, reducing inventories, and especially just-in-time delivery. But due to reduced work forces, I do not need another system to interact with and input data for. Come up with a system

or process that interfaces with SARSS, and you are getting me the supplies I need with the personnel and equipment I have on hand without any additional steps.

This is just a comment from a supply management officer who deals with too many systems already.

**MAJ Robert J. Kincaid, WVARNG**  
Buckhannon, West Virginia

*The following response was provided by the Velocity Management team at the Combined Arms Support Command, Fort Lee, Virginia.*  
—Editor

Velocity Management (VM) is concerned about the problems in communicating from one logistics system to another. The idea of being able to order pharmaceutical supplies via the Internet is great, as long as it works when we deploy. VM seeks to avoid causing the ULLS clerk confusion by having different procedures for ordering different items. One of the major causes of failure for our logistics system is this lack of communication.

VM consistently tries to root out the underlying causes and correct them. A recent example is the DLA AMS (Automated Manifest System) and the SARSS AMS not working together to close out the transportation segment for order and ship time. The VM process identified the problem and found the solution.

Our next generation of logistics automation should solve many of these problems. This is why VM plays an active part in helping determine how the Global Combat Support System-Army (GCSS-Army) [formerly Integrated Combat Service Support System, or ICS<sup>3</sup>] will work.

**Major Gust W. Pagonis**  
Fort Lee, Virginia

Log Notes lets you share your thoughts on logistics. You may want to comment on an *Army Logistician* article, take issue with something we've published or something happening in logistics, or share an idea on how to do things better. Your letter will be edited only to meet style and space constraints. All letters must be signed and include a return address; if you request, your name will not be published. Mail letters to EDITOR ARMY LOGISTICIAN, ALMC SUITE C300, 2401 QUARTERS ROAD, FT LEE VA 23801-1705; send them by FAX to (804) 765-4463 or DSN 539-4463; or e-mail to [alog@lee-dns1.army.mil](mailto:alog@lee-dns1.army.mil).



## ARMY BUDGET MAINTAINS READINESS AND CONTINUES MODERNIZATION

The Army's proposed budget for fiscal year (FY) 1999 is designed to continue vital modernization programs, maintain unit readiness, further integrate the Army's active and reserve component force structure to create a seamless, total force, and increase the quality of life of soldiers. As submitted by the President to the Congress, the budget requests total obligational authority of \$64.3 billion. This represents an increase of \$3.3 billion, or 5.4 percent, over FY 1998 spending. The total includes \$1.5 billion in programs transferred to the Army under the Defense Reform Initiative, including chemical demilitarization and commissary operations. (See the article on the Defense Reform Initiative in the March-April issue of *Army Logistician*.)

The appropriations request for military personnel totals \$26.6 billion, up slightly from \$25.8 billion in FY 1998. That will support an end strength of approximately 480,000 soldiers in the active Army (down from 488,000), 357,000 in the Army National Guard, and 208,000 in the Army Reserve. The Army also will reduce its civilian work force by about 1 percent, to 237,000.

The operations and maintenance budget request is \$20.9 billion, up from \$20.4 billion. This level of funding will maintain readiness by supporting—

- Ground operating tempo (OPTEMPO) and flying hours that meet the Defense Planning Guidance for FY 1999. The budget will permit active Army yearly OPTEMPO of 800 miles for the M1 Abrams tank, 934 miles for the M2 Bradley infantry fighting vehicle, and 970 miles for the M3 Bradley cavalry fighting vehicle and monthly flying of 14.5 hours for attack helicopters and just under 14 hours for other aircraft.
- Ten brigade rotations (9 active and 1 National Guard) at the National Training Center at Fort Irwin, California; 10 brigade rotations at the Joint Readiness Training Center at Fort Polk, Louisiana; and training for 8 corps and division command groups and staffs through the Battle Command Training Program.
- Expansion of basic combat training and one-station unit training by 1 week, beginning 1 October. This expansion will give the Army more time to instill Army values in soldiers and enhance their professional pride.
- Improvement of infrastructure needed for strategic mobility. Planned infrastructure improvement projects will take place at four installations, two airfields, one strategic seaport, and five ammunition depots and plants.

The procurement request calls for an 18.8 percent increase in funding, from \$6.9 billion in FY 1998 to \$8.2 billion in FY 1999. Those funds will enable the Army to continue to focus its modernization strategy on achieving

## ART DIRECTOR RETIRES AFTER 37 YEARS

De Fonce Threatt, *Army Logistician's* Art Director for the past 12 years and staff artist for 6 earlier years, has retired. Mr. Threatt prepared art and copy layouts for 112 issues of *Army Logistician* during his tenure with the Army Logistics Management College.

He also worked for the Army Quartermaster School for 19 of his 37 years of service.

"We'll miss you, De!"

—ALOG Staff

(Continued on page 44)



# ALOG NEWS

*(Continued from page 1)*

information dominance on the battlefield, ensuring that Army forces overmatch any potential foes in combat, recapitalizing aging systems, and increasing modernization efforts in the Army National Guard and Army Reserve.

Specific procurement requests include 22 UH-60 Black Hawk helicopters; 120 upgraded M1 Abrams tanks; 73 upgraded M2 Bradley fighting vehicles; and 2,038 trucks in the family of medium tactical vehicles. Procurement requests for the reserve components include 10 Black Hawk helicopters and 153 heavy equipment transporters for the National Guard, 96 palletized loading systems for the National Guard and Reserve, and sixty-six 20-ton dump trucks, 12 for the National Guard and 54 for the Reserve.

The budget also provides \$900 million for the chemical demilitarization program. This funding will continue development of chemical demilitarization facilities, which are in the following stages: in operation at Johnston Atoll and Tooele, Utah; under construction at Anniston, Alabama, Pine Bluff, Arkansas, and Umatilla, Oregon; in design at Aberdeen, Maryland, and Newport, Indiana; and seeking environmental permits at Blue Grass, Kentucky, and Pueblo, Colorado.

The budget seeks \$4.8 billion for research, development, test, and evaluation (a small decrease from \$5 billion), \$910 million for military construction (up from \$800 million), and \$1.2 billion for family housing (down from \$1.3 billion). The military construction request includes \$307 million for the whole barracks renewal program to improve the living conditions of single soldiers. Total spending for environmental programs will amount to \$1.28 billion, which will pay for environmental compliance, disposal of hazardous materials, pollution prevention, and conservation of natural and cultural resources.

## WORK BEGINS ON ARMY AFTER NEXT

Now that the latest Force XXI advanced warfighting experiments have been completed, the Army Combined Arms Support Command (CASCOM), Fort Lee, Vir-

ginia, has begun development of the Army After Next (AAN).

The logistics support concept for AAN is just entering the developmental stage. The discussions, workshops, and wargames conducted thus far have revealed a wide variety of ideas that will help to shape the logistics support of the next century. There are some important parameters to keep in mind when developing this support. The operations as currently envisioned for AAN will require a fundamental shift in how the Army trains, from the ground up. CASCOM is trying to define the technologies that will be required to support those operations.

The primary method of identifying and exploring issues across many disciplines is the use of computer-supported wargames. The summer wargame at Carlisle Barracks, Pennsylvania, focused on the strategic level to identify major issues, primarily related to deployment. This game allowed the logistics community to explore issues related to the development of new deployment technologies. The tactical wargame at Fort Leavenworth, Kansas, provided a more detailed look at the sustainment issues for supporting the new AAN battle forces. It was also an opportunity to test certain operational support concepts that had been developed in previous games and workshops.

Developing the support of future forces is as difficult as envisioning the forces themselves. There are many assumptions that have been made throughout the AAN process as a whole, many of them based on technologies deemed theoretically possible 30 years from now. Recent history shows computer speed doubling every 6 months, with concurrent increases in storage space and computing power. Using that history, it is easy to extrapolate that certain technologies that currently do not exist may be prevalent in the future.

The AAN project was established in February 1996 by the Chief of Staff of the Army and the Commanding General, Training and Doctrine Command, to help the Army leadership craft a vision of future Army requirements. The AAN mission is to conduct broad studies of warfare 30 years from now to frame issues vital to the development of the U.S. Army after about 2010. Those issues will be used to focus TRADOC combat development programs.

The logistics "franchise" of the AAN project was awarded to CASCOM in June 1997. CASCOM's lead agency to develop the project is the Combat Service Support (CSS) Battle Lab. In the months since the activation of the franchise, the Battle Lab has been identifying goals, objectives, and parameters for the effort. As the logistics franchise holder, CASCOM represents all of the CSS, health service support, and personnel service



support branches in the development of concepts of support for AAN forces.

For more information on AAN technologies and concepts under development at CASCOM, contact Major Michael E. Lynch at (804) 734-1808 or DSN 687-1808, or e-mail [lynchm@lee-dns1.army.mil](mailto:lynchm@lee-dns1.army.mil). Information is also available on the CASCOM home page at <http://www.cascom.army.mil/cssbl/Army After Next/>.

## RECHARGEABLE BATTERIES IN DLA CATALOG

Two types of reusable batteries (alkaline and nickel cadmium) and their associated rechargers are listed for the first time in the 1998 Defense Logistics Agency (DLA) Environmental Products catalog. The alkaline rechargeable batteries are available in AA, AAA, C, and D sizes and are manufactured by Rayovac Corporation under the RENEWAL brand name. The ni-cad batteries come in 9-volt, AA, C, and D sizes and are manufactured in accordance with the National Electrical Manufacturers Association/ American National Standards Institute (NEMA/ ANSI) standard. Using rechargeable batteries will help Army units meet the Army-wide goal of a 50 percent reduction in battery procurement costs.

The Defense Supply Center Richmond (DSCR), a branch of DLA, is the primary provider of batteries to all of the military services. Visit the DSCR home page (<http://www.dscr.dla.mil>) for a complete list of DSCR batteries and current information on aviation batteries. Department of Defense customers also may choose the direct online ordering link on the DSCR home page to purchase a select group of batteries using military standard requisitioning and issue procedures (MILSTRIP). For more information on reusable batteries, contact Victor Poltrick, DSCR, at (804) 279-5536 or email [vpoltrick@dscr.dla.mil](mailto:vpoltrick@dscr.dla.mil). Questions about the catalog or DLA environmental products should be directed to Steve Perez at (804) 279-6054 or email [sperez@dscr.dla.mil](mailto:sperez@dscr.dla.mil).

## CORRESPONDENCE COURSE ENROLLMENT AVAILABLE THROUGH INTERNET

Soldiers now can enroll in the Army Correspondence Course Program (ACCP) through the Internet.

A catalog of courses is available through the Army Institute for Professional Development (AIPD) home page at <http://206.135.244.97/accp/aipd.htm>. Another route to the AIPD home page is through the Army Training Support Center's *Trainer On Line* home page. The

address is <http://www.atsc-army.org>. Select Army Training Support Center and correspondence courses.

## DEPLOYMENT STOCK PACKAGE PROJECT UNDERWAY

The Army Logistics Integration Agency (LIA), a field operating agency of the Office of the Army Deputy Chief of Staff for Logistics, and the Army Materiel Systems Analysis Activity have developed a concept for an automated, interactive process for developing deployment packages. The concept includes initial planning based on generic profiles and missions; asset visibility, dollar values, and package weight and cube data; customer modifications; virtual stockage; and a real-time adjustment of the package at the time of deployment.

The process is scheduled to be tested during a spring rotation at the National Training Center. A study advisory group, composed of representatives from Headquarters, Department of the Army; Army Forces Command, Army Combined Arms Support Command, Army Materiel Command, and others, will determine follow-on actions to include project transition, handoff, maintenance, and fielding.

The LIA point of contact is William Koenig, (717) 770-6655, DSN 977-6655, or e-mail [william.koenig@hqda.army.mil](mailto:william.koenig@hqda.army.mil).

## DLA LOGISTICS SERVICES CENTER RENAMED

The Defense Logistics Services Center (DLSC) at Battle Creek, Michigan, has been renamed the Defense Logistics Information Service (DLIS). The activity's new name better reflects its increased role in providing logistics information through the centralization of Defense Department cataloging at the Battle Creek Federal Center. DLIS is an element of the Defense Logistics Support Command, a subordinate command of the Defense Logistics Agency.

DLIS operates the Federal Catalog System, which combines the individual cataloging efforts of the armed services and several Department of Defense activities. DLIS also manages a data base that serves as a repository for more than 7 million items used throughout the Federal Government. Its technical experts also support the electronic registration of vendors in the centralized contractor registry, provide electronic access and ordering information for technical drawings, develop computer systems that track supply shipments electronically, and offer other logistics information products and services in multimedia formats.



## **MORE DRMO'S TO CLOSE**

The Defense Logistics Agency (DLA) has announced that 49 more Defense Reutilization and Marketing Offices (DRMO's) will close, bringing to 70 the number of offices scheduled for closure in fiscal years 1998 and 1999. The closures result from DRMO restructuring and Base Realignment and Closure Commission recommendations. Sixty-eight DRMO's will remain open.

DRMO's are field activities of DLA's Defense Reutilization and Marketing Service (DRMS). They receive, temporarily store, and dispose of personal property such as vehicles, equipment, hand tools, clothing, and furniture that the military services no longer need.

The DRMS estimates that the latest closures will result in a one-third reduction in DRMO operating costs beginning in fiscal year 2000, which translates to \$35 to \$40 million annually. However, there will be only a negligible reduction in disposal services.

The newly announced closures will affect approximately 350 employees in 25 states. DLA plans to offer these employees job-placement and training opportunities as well as separation incentives.

## **TOTAL FORCE ID CARDS TO BE ISSUED**

Within the next 2 to 5 years, green "Total Force" identification cards will be issued to all active component and Reserve active status U.S. military personnel.

Reserve active status ID cards will change from red to green. Reserve active status forces include members of the Selected Reserve, the Individual Ready Reserve, and the active Standby Reserve. Only the color of the card will change. There will be no change to service benefits, privileges, or entitlements unless a change in status occurs. The red ID card will continue to be issued to members of the Retired Reserve who have not reached age 60 and to family members of Reservists.

Secretary of Defense William S. Cohen announced the change earlier this year in keeping with his pledge to eliminate "all residual barriers—structural and cultural—to effective integration of the Reserve and active components into a 'seamless Total Force.'"

## **MTMC ESTABLISHES DEPLOYMENT SUPPORT COMMAND**

Fort Eustis, Virginia, will be the site of the Military Traffic Management Command's (MTMC's) new Deployment Support Command headquarters. The command will be created by consolidating MTMC's Eastern and Western Area Commands. The merger is a result of the 1995 Base Realignment and Closure Commission's

recommendation to close the Military Ocean Terminal Bayonne in New Jersey and Oakland Army Base in California.

With a work force of about 35 military and 437 civilian personnel, the Deployment Support Command will operate water terminals in the Americas and Caribbean, manage the Defense Freight Railway Interchange Fleet, and oversee traffic management functions in the continental United States.

Another significant mission for the command will be the training and readiness of 20 Army Reserve and two Navy Reserve units wartraced to MTMC.

Relocation of the MTMC elements to Fort Eustis has already begun and is expected to be completed by June 1999. A provisional command responsible for transition planning was established 1 October 1997, under the leadership of MTMC Eastern Area's Commanding General. In February, the Command's Ocean Cargo Booking Division became the first operational element to complete its migration and become fully operational at Fort Eustis.

The phased transition will continue, with a substantial advance party arriving this summer. The Deployment Support Command will be officially established at Fort Eustis 1 October 1998.

MTMC is the Army's component of the U.S. Transportation Command. It provides transportation management, information systems, and transportation engineering services for the deployment, sustainment, and redeployment of U.S. Forces worldwide.

## **EPA-APPROVED REFRIGERANTS AVAILABLE**

The Defense Logistics Agency's (DLA's) Defense Supply Center Richmond (DSCR) has added an Alternative Refrigerants category to the 1998 DLA Environmental Products Catalog. These alternative refrigerants are approved by the EPA Significant New Alternatives Policy (SNAP) and are easily obtained through the Federal supply system. Their cost is substantially lower than the class I ozone-depleting chemicals (ODC's) they replace and usually much lower than local purchase prices, especially overseas. Class I ODC's are substances that deplete the Earth's protective ozone layer. The United States has banned manufacturing and importing class I ODC's and has sharply raised the Federal tax on such chemicals.

The new refrigerants are not "drop in" replacements for any class I ODC's. Regardless of which system is involved, the system manager must approve the use of the new refrigerant and ensure that appropriate retrofit work is carried out where needed.

Under the Clean Air Act's SNAP, the U.S. Environmental Protection Agency (EPA) identifies and publishes lists of alternatives to class I ODC's. More infor-



## PLS TANKRACK ENHANCES FUEL DISTRIBUTION



The new palletized loading system (PLS) tankrack is the Army's latest innovation in battlefield refueling. It is versatile, compatible, and easy to operate, according to soldiers of the 418th Transportation Company at Fort Hood, Texas, who are field testing the new system.

With the PLS 3000D tankrack, fuel is stored in a box-like metal container that can be hauled over any terrain by a special PLS tractor-trailer. "The PLS is so versatile," says Major Wendell Harris, operations officer for the 180th Transportation Battalion, the 418th's parent organization. "It makes everything work better. The tankrack is an-

other great application of the PLS. You can drop off a container of fuel [at a designated refueling point] and then use the PLS for another mission."

Because the PLS tankrack is configured on an ISO container, it is also easy to transport by rail or flatbed trailer. The tankrack even can be air dropped into tactical areas on the battlefield or along convoy routes.

With little or no training, a single soldier can operate the PLS tankrack system. When combined with the PLS trailer, the total hauling capacity of the new fuel system is 6,000 gallons, which is more than the 5,000-gallon heavy extended mobility tactical truck.

mation is available from EPA's SNAP program hotline at (800) 296-1996. Overseas callers can dial (301) 614-3396. EPA's SNAP website is at <http://www.epa.gov/ozone/title6/snap>. The inventory manager at DSCR is Paula Matthews, (804) 279-6441 or DSN 695-6441.

### ARSENAL PREPARES HOWITZERS FOR BOSNIA

Rock Island Arsenal, Illinois, recently completed refurbishment of 116 M114 155-millimeter medium towed howitzers for transfer to Bosnia. The transfer is part of a Presidentially directed effort to improve that nation's armed forces.

Originally produced during World War II, the M114 howitzer was a mainstay of the Army's field artillery for

over 30 years, including its use during the Korean and Vietnam Wars. Many M114's were manufactured at Rock Island. The M114 was replaced by the M198 howitzer and is no longer in the Army inventory. The 116 guns going to Bosnia were refurbished in the 1980's and then placed in storage at Letterkenny Army Depot, Pennsylvania.

For the Bosnia project, the howitzers were taken out of storage and shipped to Rock Island. At the arsenal, they were inspected thoroughly, repaired as necessary and restored to peak operating condition, tested through simulated firings, and inspected a final time before being packaged for shipment to Bosnia. The Armament and Chemical Acquisition and Logistics Activity (part of the Army Tank-automotive and Armaments Command); the



Armament Research, Development, and Engineering Center; and the Army Industrial Operations Command assisted arsenal personnel in completing the project.

The refurbishment project at Rock Island was completed at a cost of \$2.6 million, which was \$300,000 under the estimate. The refurbished howitzers were hauled by truck (two apiece on open-bed trailers) to the port of Charleston, South Carolina, where they were loaded on a ship for Bosnia.

## ARPERCEN BECOMES AR-PERSCOM

Following a series of organizational changes, the U.S. Army Reserve Personnel Center (ARPERCEN) recently became the U.S. Army Reserve Personnel Command (AR-PERSCOM). AR-PERSCOM, still located in St. Louis, Missouri, is expected to be more efficient and cost effective in performing personnel management functions.

"The Army Reserve has undertaken a concerted effort to reengineer ARPERCEN's business processes by automating records management and streamlining organizational structure and work processes," said Colonel Donald G. Conaway, commander of the new personnel command. "The Army Reserve is converting ARPERCEN with its passive role of a records repository into AR-PERSCOM with its proactive role in personnel management."

AR-PERSCOM has almost 500 fewer civilian workers than ARPERCEN had 4 years ago. But new workplace processes, such as electronic storage and retrieval of records, are reducing the time and number of employees required to perform essential tasks. AR-PERSCOM is working with Carnegie Mellon University, Pittsburgh, Pennsylvania, to improve the way things are done and to assist employees with the transition to new systems.

## HAZMAT RE-USE CENTER SAVES ARMY \$\$\$

The Hazardous Materials (HAZMAT) Re-Use Center, which is operated by the 98th Area Support Group Directorate of Logistics in Wuerzburg, Germany, often is able to furnish frequently used hazardous materials to U.S. Army, Europe (USAREUR), units and activities at no cost.

Unopened hazardous materials, such as paint, brake fluid, and insecticides, that are found to be overstocked or unneeded are shipped USAREUR units and activities to the HAZMAT Re-Use Center. They are checked, tested, and repacked before being stored on the center shelves. Other USAREUR units may then contact the Hazardous Materials Re-Use Center before ordering

these same items. If the materials are on hand, they will be shipped to the requesting unit at no cost.

According to Raymond Stead, the Center's manager, "The program is important [because] it reduces direct costs to the U.S. Army by eliminating stockpiles of hazardous materials, unnecessary procurement, and disposal costs of such materials." Environmentally safe disposal of some items can cost up to three times the cost of the item itself.

For more information, USAREUR units may contact the Hazardous Materials Re-Use Center at DSN 352-4804.

## ARMY VALUES

### **Loyalty**

Bear true faith and allegiance to the U.S. Constitution, the Army, your unit, and other soldiers.

### **Duty**

Fulfill your obligations.

### **Respect**

Treat people as they should be treated.

### **Selfless Service**

Put the welfare of the Nation, the Army, and your subordinates before your own.

### **Honor**

Live up to all the Army values.

### **Integrity**

Do what's right, legally and morally.

### **Personal Courage**

Face fear, danger, or adversity (physical or moral).

## LDRSHIP = Leadership

Approved by the Chief of Staff of the Army on  
13 January 1998.

Described in FM 22-100, Army Leadership.



## FOXHOLE COVER PROTECTS SOLDIERS

A new, prefabricated overhead cover system now being fielded by the Soldier System Command's Project Manager-Soldier (PM-Soldier) at Natick, Massachusetts, will help protect soldiers during an artillery attack.

The fighting position overhead cover (FPOC) allows for quicker preparation of fighting positions with less difficulty. The FPOC has a tubular steel frame that is covered first with a hard polypropylene backing and then a woven polypropylene waterproof material. It is placed over a standard two-person foxhole that is then covered by sandbags or loose soil and camouflaging brush and grass. The tubular frame, which can support up to 32 inches of sandbags or soil when spread evenly, eliminates soldiers' dependency on lumber, plywood, plastic waterproof sheets, and nails, which have a low battlefield transportation priority. When placed over a foxhole, the soil and sandbags keep incoming fragments from penetrating and absorb the shockwaves of a blast. A sandbag-fortified FPOC can withstand repeated air bursts of artillery rounds as large as 155 millimeters and can survive a contact burst of mortar rounds as large as 81 millimeters.

The FPOC is carried in a folded position that measures 48 by 16 by 6 inches. When opened, the FPOC

measures 48 by 40 by 3 inches. It weighs 25 pounds and is easy to transport and stack in the field.

## MEDICAL SERVICE CORPS HISTORY AVAILABLE

The Army's medical logisticians now have a comprehensive publication that chronicles their history and contributions to the Nation. The Army Center of Military History has issued *The History of the U.S. Army Medical Service Corps*, by Richard Van Ness Ginn.

The Medical Service Corps includes health service administrators, health supply specialists, health services maintenance technicians, laboratory sciences specialists, preventive medicine technicians, social workers, clinical psychologists, pharmacists, optometrists, podiatrists, and aerial evacuation officers. Although the corps was established in 1947, its antecedents go back to the commissary of medical stores and the apothecaries of the Revolutionary War.

Copies of the book may be requisitioned through the Army Publications Distribution Center as CMH Pub 30-19 (hardbound) or CMH 30-19-1 (softbound) or ordered from the Superintendent of Documents for \$36 softbound (GPO S/N 008-029-00308-2).



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# Movement Control Operations in Bosnia

by Captain Matthew M. Schwind

One of the greatest challenges in today's operations other than war environment is the ever-increasing emphasis on logistics and logistics support to accomplish a mission. Transportation and movement control operations in the former Yugoslavia played a critical role in the support, sustainment, and longevity of Operations Joint Endeavor and Joint Guard and continue today in supporting the needs of the soldiers there.

Movement control has been critical to maintaining the support flow, velocity management (VM), and intransit visibility (ITV) of supplies, equipment, and personnel into and out of the former Yugoslavia. Movement control teams (MCT's) positioned from Germany to Bosnia-Herzegovina work around the clock to maintain the supply flow; monitor deployment, sustainment, and redeployment of all cargo, equipment, and personnel throughout the theater; and provide up-to-date information needed by commanders and supply managers at the unit level.

Based on my recent tour in the former Yugoslavia as commander of MCT Tuzla, I would like to discuss the experiences of and lessons learned by the MCT's that operated from December 1996 to May 1997 in Taszar,

Hungary; Slavonski Brod, Croatia; and Tuzla, Bosnia-Herzegovina. These MCT's diligently supported brigade combat teams of the 1st Infantry Division (Mechanized) as well as a host of North Atlantic Treaty Organization and U.S. support units. Over 30,000 soldiers required support throughout Hungary, Croatia, and Bosnia during that period.

The sustainment of forces in the former Yugoslavia was a massive undertaking because of the tremendous length of the supply lines of communication. Supply depots in the United States and Germany were used heavily. The primary means of transport were trucks and aircraft. Supply shipments leaving Germany used ground transport almost exclusively. Air transport proved to be much faster, but few usable runways in the theaters and unfavorable weather patterns shifted a tremendous amount of the resupply effort to ground transport. The 21st Theater Army Area Command's 37th Transportation Command was the reliable transportation workhorse of the entire theater. Local contractors and Brown & Root Services Corporation (BRSC) provided additional support. BRSC was invaluable in reacting to and providing support for unforecasted transportation requirements.

## Radio Frequency Tagging

For ITV, MCT Tuzla was the final destination of all inbound freight that would support the 1st Infantry Division and the U.S. sector of Bosnia. We were charged with obtaining inbound clearance from MCT's in Croatia, Hungary, and as far away as Germany, then passing this information to supply managers in the U.S. sector of Bosnia. Supply managers collocated with the 1st Infantry Division G4 were readily available to receive information on the types, numbers, and locations of their cargo as it traversed five countries with two overnight stops on its way to Bosnia.

Radio frequency (RF) tags allowed MCT's to track cargo from the initial "burn station," where the RF tag was formulated and scanned, all the way to the destination container yard in Bosnia. Ground scanners that were capable of reading RF tags were located at strategic choke points along the 3-day route and enabled MCT's to pinpoint the location of specific containers en route. A container holding area in Taszar, Hungary, served as a trailer transfer point for shipments destined for Bosnia and Croatia, allowing drivers to rest and movement control personnel to confirm destination times and locations of specific containers. The RF tag system, backed up by transportation control movement documents, allowed movement controllers and supply personnel to make final confirmation checks.



Some lessons we learned using RF tags were—

- Ensure that all containers and high-visibility shipments have RF tags attached to them. As many as 40 percent of the containers entering Bosnia had no RF tags affixed to them, or the tags were not formulated properly and were unusable. Successful units had RF tag points of contact who implemented quality control checks. Battalion-level S4 personnel often were called upon for this duty, but, ideally, training and familiarization with RF tags should have extended down to company level.

- Maintain continuous quality control at RF tag burn stations. This is necessary to ensure proper formulating and burning of the RF tags so that information about the supply class and quantity is correct and as detailed as possible. Constructing these tags is a supply function; if it is not done correctly with as much specific data entered as possible, the MCT's and supply managers on the receiving end will not know the exact contents of a container or a pallet, which can cause unnecessary delays and frustration of cargo. The burning of tags is often accomplished at supply depot level, but it can also be done at unit level in the field for units preparing for redeployment or retrograding of equipment. Supply discipline and quality control ensure that a proper and useful tag is affixed to each shipment.

- Establish and maintain a direct communication link between supply managers at both origin and destination in order to complement and cross-reference the information flow between MCT's at the two sites.

The RF tag system currently in use is a very powerful tool for maintaining visibility of supply shipments. Supply containers that will better accommodate RF tags and prevent the loss of tags while in transit are being developed and fielded. Stationary ground scanners at choke points are being refined and upgraded for durability and low maintenance. Indeed, all indications point to continued use and wider application of RF tags as an aid to ITV. Because of this evolution, logisticians, and transporters in particular, need to focus on and become experts in the use of RF tags.

### **Transportation and Support Concepts**

The relationship between division and echelons-above-division (EAD) transportation often has been tumultuous and turbulent. Whose assets will be used for which mission? What is the role of independently contracted civilian transportation companies such as BRSC? In Bosnia, these issues and many more were debated and resolved among commanders and transporters throughout the theater. Because of the extremely long supply lines, transporters often had to coordinate assets and movements with numerous other transporters and supply managers. As priorities or mode of transport changed,

ripples often were felt far down the line. In addition, commands and command structures would change over the months, and new faces would have to be "read in" on the plan.

Logistics commanders and decision makers were spread over three different countries. In an environment where communication capabilities were severely hampered, passing information often became the biggest challenge. As we were departing Bosnia-Herzegovina in May 1997, commercial Sprint phone lines were being installed. Up to that point, reliable and consistent phone communication simply was not available between Bosnia and Hungary. E-mail was probably the most effective and widely acclaimed communication tool. E-mail allowed MCT's to pass inbound clearance reports when the phones or the Department of the Army Movement Management System-Revised (DAMMS-R) were down. Because of the unique position of the Bosnia MCT, e-mail was often our only means of communication with MCT's in Croatia, Hungary, and Germany. Defense Switching Network capability was limited in the theater, but the lines that were available were used heavily. Mobile subscriber equipment phones were not reliable for cross-border calls.

These communication challenges meant that passing information and gaining visibility of what was flowing through the supply channels often were a "pull" system instead of the preferred "push" system. Transporters and movement controllers were always trying to improve their information accuracy and flow with communication equipment upgrades and renewed emphasis on supply discipline.

Some lessons learned about transportation and support concepts were—

- Establish a support plan and document it with operation orders and letters of agreement or understanding between separate commands. With the large turnover of units and personnel in the former Yugoslavia, it was necessary to keep historical records to help new commanders and leaders understand past events and how they relate to present and future operations.

- Create compatible communications. With supply lines that spanned five countries, redundant and compatible communication tools were needed in Bosnia. Since the installation of Sprint, most of the communications problems may be solved. Transporters, and especially movement controllers, whose lifeblood is the passing of accurate information, need to use and master all available communication tools to "push" information to the next MCT, higher headquarters, or customer instead of having those agencies "pull" the information. Supply managers also need to realize that transporters are slaves to the supply system. Movement controllers pass to the customer the information they receive from supply chan-



nels. Like any system today, garbage in equals garbage out. Strict supply discipline and redundant communication between supply channels eliminate a lot of guesswork and promote a smooth, predictable flow. In Bosnia, I would often get information from both sister MCT's and supply managers on the type, number, and status of supplies that were inbound. This dialogue between logisticians proved effective and very valuable in maintaining ITV. After all, when answering the who, what, when, where, why, and how of the supply flow, only supply and transportation together can answer all six questions.

### Deployment and Redeployment Operations

The deployment and redeployment of forces in the former Yugoslavia were significant emotional events in the lives of many of the logisticians involved. The movement of 8,000 soldiers into and out of Bosnia for the 1st Infantry Division was the fundamental operation, with perhaps thousands of other soldiers in "slice" units moving simultaneously. Some combat equipment from the 1st Infantry Division's 2d Brigade Combat Team stayed in the theater for the follow-on brigade combat team, but the majority of unit equipment moved with the units during the relief-in-place mission.

By definition, relief-in-place meant that combat operations would not cease. The mission's concept of support, therefore, had to envision a 40-percent surge in personnel and equipment coming into the theater before units would complete their battle hand-over tasks and begin their redeployment. Because of a finite number of transportation assets, it was necessary to stockpile sustainment supplies in anticipation of this surge, so that at the critical time and place, transportation assets would not be tied up moving sustainment but would be available to move unit equipment and supplies into or out of the theater. The job for transporters included intense asset management and convoy scheduling.

Palletized loading system (PLS) trucks, as well as military and commercial flatbed trucks, were the main haulers of equipment and containers, while commercial buses moved the majority of the soldiers. Rail was used heavily from Germany to the intermediate staging base in Tazsar, Hungary. Redeploying units would be backhauled from there to Germany on the same trains. The number of people and quantity of equipment moved in a 45-day period was staggering considering the limited assets available. Nearly 8,000 soldiers were moved on commercial buses. Over 700 containers and ISU 90's (internal air-lift/helicopter slingable container units) and 200 tracked vehicles needed heavy equipment, PLS, and flatbed transport. In addition, as units deployed and redeployed, sustainment supply convoys were still rolling into the theater. Motor transport operators were making two and

three runs a day to keep up with the blistering pace of unit moves and resupply.

There were daily unit convoys from Bosnia to Croatia, then on to Tazsar. Because of the task organization of military police (MP) units in Bosnia, no direct-support MP units were identified specifically to enforce movement priorities and convoy discipline on the main supply routes. MP's patrolling in assigned sectors could be called on to enforce battlefield circulation, but without a dedicated MP unit with command and control of the routes, maintaining main supply route discipline and convoy control was difficult at best. Commanders were not discouraged from ordering convoys to starting points early, which sometimes caused prolonged delays for planned convoys. Movement controllers and division transportation staff personnel could only plan and anticipate so much without direct-support MP's to enforce the movement plan.

Deployment and redeployment operations produced some valuable lessons learned—

- More dialogue and written agreements are needed between EAD and division staffs to facilitate a productive operation and document historical data critical to the continuation of operations and seamless transition of commands.

- Direct-support MP units need to be attached to the division G4 to enforce movement priorities and convoy discipline and consolidate route status reports. Too often units in Bosnia would travel at will, and convoy departure times were unenforceable. MP's in the sector worked as a light reconnaissance unit, forfeiting battlefield circulation control in favor of patrolling individually assigned unit sectors. A direct-support MP company would lend some teeth to any movement plan and allow the G4 to place MP's at critical intersections and checkpoints to enforce movement and transportation priorities dictated by the division transportation officer.

The experience gained and lessons learned during Operations Joint Endeavor and Joint Guard will continue to be the subject of many articles and discussions for years to come. With the unique challenges facing logisticians in the former Yugoslavia, innovative thinking, solid and productive command relationships, and methodical application of logistics doctrine will continue to be the solutions to moving and sustaining our troops and equipment.

*Captain Matthew M. Schwind is commander of the 256th Movement Control Team, 49th Transportation Battalion (Movement Control), Fort Hood, Texas. He is a graduate of Officer Candidate School, the Field Artillery Officer Basic Course, and the Combined Logistics Officer Advanced Course.*



# Forward Support Distribution in Bosnia

by Major Martin Pitts, Captain John M. Broomhead,  
and First Lieutenant Jack Mowreader

One of the notable events of the U.S. mission in Bosnia-Herzegovina was the withdrawal of the 1st Armored Division and its replacement by the 1st Infantry Division (Mechanized) in late 1996. At that time, the 1st Infantry Division assumed command and control of Task Force Eagle, the U.S. component of the NATO Implementation Force (IFOR). Shortly thereafter, the IFOR became the Stabilization Force (SFOR), and Operation Joint Endeavor became Operation Joint Guard. In assuming its IFOR/SFOR mission, the 1st Infantry Division had to adopt some innovative concepts in order to provide support. One of these innovations was using a field artillery battery, equipped with the M1074 palletized loading system (PLS), to form a provisional forward support distribution company.

This company, added to the division's 299th Forward Support Battalion (FSB), gave the FSB a flexible and responsive delivery capability during Operation Joint Guard from October 1996 to April 1997. The company pushed materiel from the supply support activity (SSA) at Guardian Base to units located at base camps and remote sites throughout Bosnia. In the process, the artillery soldiers became combat multipliers, providing logistics support to units throughout Task Force Eagle's area of responsibility. They used their organic divisional PLS assets to sustain the division's 2d Brigade Combat Team (BCT) by providing their lifeline for all supply commodities.

## The 'Big Red One' Moves In

The 2d BCT of the 1st Infantry Division deployed from Germany to serve as the covering force (CFOR) for the withdrawal of the 1st Armored Division in November 1996. The 2d BCT relieved the 1st Armored Division, which returned to its home station in Germany after a 12-month deployment in Bosnia. According to the CFOR mission statement, the 1st Infantry Division assumed the following responsibilities in Bosnia—

- Cover the withdrawal of the 1st Armored Division.
- Take charge of the Multinational Division North (MND-N) Sector without accident or incident. The MND-N Sector includes Russian, Turkish, and Nordic-Polish brigades in addition to the U.S. contingent. (The Nordic-Polish brigade includes personnel from nine European countries: Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, Poland, and Sweden.)
- Enforce compliance with the General Framework Agreement for Peace (the Dayton Accords).
- Maintain a presence throughout the sector.
- Ensure force protection.
- Deter resumption of hostilities in order to promote stability in Bosnia-Herzegovina.

## Composition and Task Organization

The CFOR mission required the 2d BCT to cover the same terrain previously controlled by a heavy division (the 1st Armored Division). This forced the CFOR to innovate.

The CFOR was built around the division's 2d Brigade, which included the 1-18th and 1-26th Infantry Battalions. However, the total CFOR was composed of 12 battalion equivalents, including the 519th and 720th Military Police Battalions, the 62d Combat Engineer Battalion (Heavy), elements of the 11th Aviation Regiment, and the 1st Medical Brigade.

The role assigned to the 1st Infantry Division Support Command (DISCOM) was to support Task Force Eagle by providing one FSB (the 299th) and a slice headquarters. The FSB (+) would provide direct support to the brigade; the slice headquarters would join the division G4 and brigade S4 to form a three-tiered logistics cell.

The 299th FSB provided 9 forward area support teams (FAST's) and supported a 1,932-line authorized stockage list. It was augmented by elements of the 701st Main Support Battalion (MSB) and the 201st FSB (from the division's 3d BCT) to provide a robust forward presence. The 299th FSB was organized into the doctrinal A (supply), B (maintenance), and C (medical) companies. For this operation, a distribution company formed from a division artillery (DIVARTY) service battery (part of the 1-7th Field Artillery Battalion) was added to handle significant mission demands in a support area covering 2,250 square miles.



## Creating a Distribution Company

The distribution company structure was developed from the logistics estimate shown below. These estimates were based on historical sustainment resupply data from the 1st Armored Division DISCOM during Operation Joint Endeavor and were modified by the 1st Infantry Division support operations officer for the 1st Infantry Division CFOR.

Unit distribution was used as the doctrinal concept of support for the 1st Infantry Division (Forward) in Bosnia. Parts were pushed to the units by the FSB. A transportation fleet was assembled to transport parts, containers, or supplies of any size using limited materials-handling equipment. The distribution company was designed to be flexible yet potent; "right-sized" was the operative buzzword. The mission analysis for the CFOR resulted in creation of a "distro-company" equipped with the following vehicles—

- 33 M1075 PLS's. (This is the PLS version without the materials-handling crane; the M1074 has the crane).
- 9 M977 cargo heavy, expanded-mobility, tactical trucks (HEMTT's).
- 5 M998 high-mobility, multipurpose, wheeled vehicles (HMMWV's).
- 5 M923 5-ton cargo trucks.
- 6 M1070/M1000 heavy equipment transporter systems (HETS).

In creating the distribution company, the DIVARTY provided the prime mission vehicle: the PLS. The service battery of the 1-7th Field Artillery Battalion augmented the 299th FSB with 27 PLS's, as well as licensed crews. (Operators and assistant operators were required to meet force protection requirements in MND-N.) The service battery also furnished company-level command and control, including the commander, first sergeant, executive officer, and two platoon leaders. Their functions

included command of transportation assets, transport operations, and maintenance and leadership of assigned soldiers. The 1-7th Field Artillery Battalion provided its organizational-level maintenance support team. This team was capable of providing organizational maintenance for the PLS's and worked with the organizational maintenance section of the 299th FSB's A Company.

The transportation motor transport company (B Company) of the 701st MSB provided six HET's, an escort HMMWV, and a contact maintenance truck. In addition, the headquarters and headquarters detachment of the 701st MSB contributed four HMMWV's, and A Company of the 201st FSB and A Company of the 299th FSB each provided three PLS's to the service battery. All of the 299th FSB's HMMWV's were available to support the mission as well.

The 299th FSB's support operations officer tasked the assets of the distribution company. Supported battalions requested transportation support through the base camp FAST. The FAST coordinated transportation assets with the FSB distribution management officer (DMO), who was located with the support operations officer. Occasionally, battalion S4's coordinated directly with the DMO. The PLS sustainment pushes to unit base camps were called LOGPAC's (logistics packages).

## Brigade-Level Support

The distribution company moved unit supplies within the Task Force Eagle area of responsibility. It made daily deliveries of clothing and individual equipment (class II), packaged fuel (class III), construction and barrier materials (class IV), major end items (class VII), and repair parts (class IX) to Task Force Eagle units at their base camps. The planning guidance for transportation assets was based on a cyclic rotation system of using each vehicle for a 1-day mission, followed by 1 day of maintenance, and then 1 day of security duty.

Potable water was provided mainly by civilian contractors, who made direct deliveries of bottled water from Central Region in Germany to Guardian Base. The distribution company pushed the bottled water forward by LOGPAC. The 299th FSB was augmented by reverse osmosis water purification unit (ROWPU) specialists, who were stationed at two base camps and provided potable water to those camps. A civilian contractor distributed A rations to each base camp. Base camps maintained a contingency stock of 5 days of supply of bottled water and meals, ready to eat.

Bulk fuel was distributed through a combination of static bag farms at base camps, which were resupplied by civilian contractors, and a small train of rail tank cars. The tank cars, which were operated by the Brown and Root Services Corporation, the logistics civil augmentation program (LOGCAP) contractor, fueled A Company's 5,000-gallon tankers. A Company then dis-

Logistics Estimate for 1-day Requirement	
Class of Supply	Quantity
Fuel	101,705.35 gallons
I	14.77 tons (containerized)
II	6.59 tons (containerized)
III (P)	.99 ton
IV	16.64 tons
VI	4.035 tons (containerized)
VIII	1.57 tons (containerized)
Water	27,419 gallons
Mail	161.44 tons (containerized)

Tons are short tons (2,000 pounds)

□ This initial logistics estimate developed by the 1st Infantry Division DISCOM provided the basis for creating the provisional forward support distribution company.



1 Distribution Platoon			3 Distribution Platoons	
Model	Noun	Authorized	Authorized	Remarks
M998	HMMWV Cargo	2	6	with radios
MTV, Truck Cargo	5-ton Cargo	2	6	with radios
M1074	PLS with MHC	2	6	
M1075	PLS without MHC	2	6	
M1077	Flatrack	8	24	
M977	HEMMT	2	6	
M1070/1000	HETS	2	6	
M931	5-ton Tractor	2	6	
M871	30-foot Trailer	4	12	
M172A1	Lowboy Trailer	1	3	
M101	¾-ton Trailer	1	3	
Total pieces		28	84	

□ The proposed MTOE for the forward support battalion distribution company includes these vehicles.

Company's 5,000-gallon tankers. A Company then distributed fuel to other base camps and remote sites.

#### Division-Level Support

The 1st Infantry Division (Forward) division transportation officer (DTO) controlled division routes and provided clearance authority for movements within the Task Force Eagle area of responsibility. The DMO coordinated with the DTO (Forward) and the 299th FSB's support operations officer to manage distribution throughout the area of responsibility. If the transportation needs of a requesting unit exceeded the capability of the division, the DTO (Forward) would coordinate with Brown and Root for outside transportation assets. Brown and Root provided critical transportation assets to the 1st Infantry Division (Forward). Their fleet of vehicles ranged from Bluebird school buses to forklifts and cranes, Kenworth tractors with 35-ton lowboy trailers, and the dauntless PLS.

The DMO forwarded all transportation requests (truck, rail, bus, and air) that were beyond the FSB's capability to fill to the servicing movement control team (MCT) collocated with the DTO (Forward) in Tuzla, Bosnia. The DMO coordinated with the MCT for items requiring backhaul to the intermediate staging base (ISB) at Taszar, Hungary, or to Germany. All backhaul containers were marked with radio frequency tags using the commodity format standard.

#### Theater-Level Support

The intransit standard for delivery of supplies from Ramstein Air Base, Germany, to Tuzla was 3 days. The air traffic movement control team (ATMCT) at Ramstein

resupplied Task Force Eagle with daily flights of personnel and air line of communication (ALOC) pallets. The ATMCT at Tuzla Air Base worked with the 299th FSB to remove pallets from Tuzla. Limited amounts of backhaul materiel were flown directly from Tuzla to Ramstein.

The 21st Theater Army Area Command (TAACOM) Logistics Operations Center managed ALOC shipments from the continental United States and Germany for on-ward movement from Ramstein to Tuzla. The 37th Transportation Command (TRANSCOM) moved ALOC stocks in Germany directly to Ramstein via the Theater Distribution Center (formerly Hub and Spoke). The Theater Distribution Center coordinated with the ATMCT at Ramstein and the U.S. Air Force Air Cargo Authority to plan the loading of palletized air shipments originating in Germany. The 21st TAACOM Logistics Operations Center prioritized ALOC shipments and maintained visibility of ALOC pallets in the queue at Ramstein. ALOC pallets stalled at Ramstein for greater than 72 hours were evaluated for shipment by truck on the 37th TRANSCOM's Eagle Express (a line-haul service). Sustainment stocks for the Task Force Eagle ground line of communication were consolidated at the Kaiserslautern Industrial Center (KIC). The 37th TRANSCOM and KIC coordinated the containerization and movement of supplies at the Theater Distribution Center.

The 37th TRANSCOM provided direct-support transportation from Germany to Guardian Base by the Eagle Express. The Eagle Express route started at the Theater Distribution Center and traveled through two convoy support centers, in Regensburg, Germany, and Bruck, Austria, before reaching the ISB at Taszar, Hungary.



sional stocks, the Express pushed south through Slavonski Brod, Croatia, to Guardian Base. The intransit standard for moving materiel from the Theater Distribution Center to Guardian Base by the Eagle Express was 5 days.

Ammunition resupply was accomplished as much as possible by throughput. Assets of the 37th TRANSCOM (Forward) pushed ammunition from the ISB to Guardian Base or Slavonski Brod. Brown and Root's PLS's were used as much as possible to deliver ammunition directly to base camps.

Mail was received at Tuzla via Channel Air from Ramstein or Tazsar. Incoming and outgoing mail was sorted by postal workers and transported daily by Brown and Root to and from the base camp mail rooms.

### The Doctrinal FSB Distribution Company

The FSB distribution company is designed to support a brigade combat team by distributing containerized or breakbulk supplies to the unit maintenance collection points. It provides support to move heavy and outsized vehicles and cargo.

The proposed MTOE (shown at left) of the distribution company includes the following types of task vehicles: 12 PLS's, 6 HEMTT's, 6 HET's, 3 lowboy trailers, 6 stake and platform tractors, 6 5-ton cargo trucks, and 6 HMMWV's. This transportation fleet is "right-sized" to push supplies and heavy-lift assets throughout the battlefield in support of a mechanized brigade. It is designed to transport breakbulk cargo or containers using little or no materials-handling equipment. The company has a headquarters, a maintenance platoon, and three identical distribution platoons with task-organized mission vehicles. For example, each platoon has a complement of HMMWV's, PLS's, HET's, HEMTT's, stake and platform tractors, and lowboy trailers. The task organization allows the FSB commander to support three mechanized battalions at the platoon level while maintaining command and control and platoon integrity. The company has a cargo-carrying capacity of 670 to 893 short tons and is 100 percent mobile.

The support platoons of the maneuver battalions act as the bill payers to field a forward support distribution company. Their distribution capabilities will be integrated into the FSB. They will need to replace their HEMTT's and 5-ton cargo trucks with PLS's and the family of medium tactical vehicles. The brigade S4 will coordinate transportation requirements with the FSB support operations officer.

The creation of multifunctional logistics companies within the Force XXI FSB will allow consolidation of CSS organizational elements currently embedded in the maneuver battalion with the direct support capability currently in the FSB. The consolidation of these elements

will be accomplished where it will enhance efficiency and effectiveness.

As a cost-reduction measure, the HEMTT-load handling system (HEMTT-LHS) concept experimentation program offers an option for retrofitting HEMTT cargo vehicles. The HEMTT-LHS is a basic cargo HEMTT modified by removing the cargo bed and the materials-handling crane and replacing the crane with the PLS LHS arm. The HEMTT-LHS will provide PLS-like capability in forward division areas. Although the payload of 11 short tons is less than a PLS can carry, the HEMTT-LHS is expected to handle 71 percent of all PLS payloads.

In Bosnia, the forward support distribution company provided by the artillery soldiers of the service battery of the 1-7th Field Artillery Battalion achieved exceptional success during Operation Joint Guard. The unit had very few accidents throughout the deployment while maintaining the highest operational tempo of any active duty company-sized element in Task Force Eagle. The PLS proved to be a flexible asset, moving containerized cargo anywhere on the battlefield.

The success of the distribution company clearly shows the need for assigning more transportation assets to an FSB so it can fulfill a distribution role. Supplies and materiel can be pushed from theater-level stocks directly to the FSB's SSA, thus bypassing the MSB. This distribution method decreases intransit time and reduces the number of times an item is handled, either through a parts warehouse or by transloading onto corps or MSB trucks.

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# CGSC-Industry

The Army Command and General Staff College and the Kansas City chapter of Business Executives for National Security have developed a research program that fosters education, understanding, and appreciation for interests shared by the military services and corporate America.

**S**ince the founding of this Nation more than 220 years ago, the military services have been defending U.S. interests all over the world. While the military has been ready to respond to any situation it was tasked to handle, U.S. industries also have played a key role. For years, a wide range of industries has supported the military services in both peace and conflict.

Several events over the last 30 years have caused dramatic changes in the U.S. military services. The turmoil of the Vietnam War, the fall of the Berlin Wall, and the decline of the Communist threat are just a few examples. At the same time, unlike in previous years, corporate America has separated itself slowly from the military.

The Army Command and General Staff College (CGSC), Fort Leavenworth, Kansas, has taken steps to bring back and strengthen the ties between the military services and corporate America. CGSC, recognized as

the keystone of the Army's school system, is working with the Kansas City chapter of Business Executives for National Security (BENS) on the CGSC-Industry Partnership Program. This program brings together CGSC students, who are mid-career majors and lieutenant commanders from all four U.S. military services and 70 foreign countries, and Kansas City businessmen. It allows both the students and the companies to gain insight from each other on their daily operations, personnel requirements, and decision-making processes.

## How the Program Works

The purpose of the CGSC-Industry Partnership Program is to give CGSC students participating in an independent research elective the opportunity to address real-world corporate problems by melding military and civilian experiences. The program also brings together CGSC and Kansas City businesses in a way that strengthens education, understanding, and appreciation for shared interests and values.

BENS then contacted several local Kansas City companies to see if they would be interested in participating in the program. Six companies came forward: Allied Signal Aerospace, Black & Veatch, Kansas City Southern Railway, Payless Cashways, Sprint Corporation, and Wilcox Electric.

Each company developed a topic for the student teams to research. Some of the topics presented were the effects of the Federal Acquisition Streamlining Act, radio frequency tag technology applications, marketing and retail automation operations, intermodal transportation systems, ground/satellite navigation, precision landing systems, and multimedia technology.

After the companies and topics were identified, CGSC conducted registration for students interested in the program. Of the 30 students who applied for the program, 3 held Ph.D.'s, 18 held master's degrees, and 3 were qualified test pilots. CGSC faculty members who served as advisers for each company reviewed the applications and matched them to a company project. Their goal was to select the best students for each company. In the end, 12 U.S. officers and 8 international officers (2 from Mexico and 1 each from Argentina, Botswana, India, Jamaica, Switzerland, and Thailand) were selected to participate in the program.

Each student team consisted of two U.S. officers from any of the services and one international officer. At the beginning of the January term, the student teams began meeting weekly with the companies. Their initial goal



# Partnership Program

by Major Kevin M. Cale

was to refine the topics so they could be researched sufficiently in the 5 months allotted to the projects.

Each student team began with an orientation and overview of its assigned company. The purpose was to have the students learn about the company, its mission, organizational structure, and people. At the same time, the company learned more about the team members and the military services.

During the second phase of the program, the student teams became familiar with their companies' administration, operations, and logistics. This helped the students to learn about their companies and define their topics sufficiently so they could research them within the allotted time.

The students and company representatives began the project by conducting literature analyses of the newly defined topics, looking for published information on their subjects. As an example, during this part of the program, the team working with Black & Veatch discovered information that saved the company considerable research time.

Each student team met with its company representative once a week, usually for about 3 hours, to discuss the project and gather additional information. It was during this time that the teams began to gather facts on their subjects, identify their findings (both positive and negative), and develop recommendations. Each team then began preparing a formal research report and presentation for its respective company. A chapter in each final report addressed the topic's relationship with and impact on the military services. At the conclusion of the program in late May, each student team presented its briefing to the company's senior management.

## Reciprocal Benefits

The companies participating in the CGSC-Industry Partnership Program have been very supportive since the program began 3 years ago. Each company has graciously opened its doors to students gathering information on their topics.

Two or three new companies have joined the program each year. Last year, the program added Farmland Industries and Employers Reinsurance. This year, the third year of the program, St. John Providence Hospital, the Dodson Group, and *The Leavenworth Times* were added. BENS solicits participation from companies in the Kansas City business community based on CGSC's areas of interest, such as distribution management, public affairs, or medical operations.

The program has been very well received by both the students and the companies involved. Some of the recurring student comments are that they have an opportunity to use their advanced degrees on the projects, they learn about the business community, and they learn lessons in working with the company that will help them in their future assignments.

The companies, meanwhile, learn more about the military structure, that the military is a good source of future employees, and that the research conducted is valuable. For example, the team working with Kansas City Southern Railway last year studied the Mexican railroad's northwest corridor. Its final report is now mandatory reading for all employees working on the Mexican railroad project.

The CGSC-Industry Partnership Program's success has allowed the college to expand into the business community in other ways, too. The CGSC master of military art and science (MMAS) degree program is now soliciting company sponsors for students enrolled in a year-long study program. This allows each MMAS candidate to focus his research on a particular area of interest that is mutually beneficial to the company and the student's educational development.

A copy of each final paper is provided to the respective company and is filed with the Combined Arms Research Library (CARL) at Fort Leavenworth. For more information on the papers, contact the CARL document section at (913) 758-3104. For more information about the program, write to the Commandant, Army Command and General Staff College, ATTN: ATZL-SWR (A456), 1 Reynolds Avenue, Fort Leavenworth, Kansas 66027; call (913) 684-2576; or send an e-mail request to [calek@leav-emh.army.mil](mailto:calek@leav-emh.army.mil).

**ALOG**

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# Golden Cargo

by Lieutenant Colonel Bob Krause, USAR



The Army's Golden Cargo exercises continue to provide logisticians with an excellent opportunity for realistic training while helping to realign the Army's munitions stocks.

**G**olden Cargo '97, the Army Reserve's premier multifunctional logistics exercise, reached its successful conclusion last June. Now, the 1998 exercise is about to begin.

The Golden Cargo exercises were initiated in 1991, when the Army Materiel Command (AMC) identified the need to reposition war stocks as part of the base realignment and closure (BRAC) process. The Army Reserve saw AMC's requirement as offering a training experience of the first magnitude. Nowhere else was there such a ready opportunity to add realism to the training mission of transportation, ordnance, maintenance, and quartermaster personnel. The size of the exercise also





□ Soldiers of the 1644th Transportation Company, Illinois Army National Guard, unload multiple launch rocket system (MLRS) pods at Letterkenny Army Depot (left). A "casualty" is loaded on a high-mobility, multipurpose, wheeled vehicle by the 351st Ordnance Battalion, an Army Reserve unit from Romney, West Virginia (above).

made it an ideal occasion for training the chain of command from top to bottom.

Although no longer part of the BRAC process, AMC's realignment needs are ongoing. This has allowed the Golden Cargo exercises to continue providing opportunities for more and better training. Since 1991, more than 54,000 tons of munitions have been transported, handled, and warehoused by Active Army, Army National Guard, Army Reserve, and Marine Corps personnel under the Golden Cargo banner. The exercise is currently managed by the 3d Corps Support Command, an Army Reserve unit under the 19th Theater Army Area Command in Des Moines, Iowa.

During the 1997 exercise, approximately 3,200 soldiers from 85 units in 26 states participated at sites at Seneca Army Depot Activity, New York; Letterkenny Army Depot, Pennsylvania; Savanna Army Depot Activity, Illinois; McAlester Army Ammunition Plant, Oklahoma; Hawthorne Army Depot, Nevada; and Sierra Army Depot, California. Scenes from that exercise are shown in the photos accompanying this article.

For Golden Cargo '98, planners estimate that 49,000 tons of war stocks will be shipped, warehoused, or otherwise handled during a 6-week exercise beginning in mid-May and running through June. The exercise sites for 1998 will be at Seneca Army Depot Activity and





□ The 1644th Transportation Company conducts a safety inspection of its trucks at Seneca Army Depot Activity (right). Golden Cargo also includes security training: in the photo above, a soldier guards his sector of a defense perimeter during lane training at Seneca. Meanwhile, two soldiers of the 597th Quartermaster Field Service Company from Puerto Rico do laundry at Letterkenny (below).



Crane Army Ammunition Activity, Indiana, as the Area of Operations East (AO East); and Sierra Army Depot and Toole Army Depot, Utah, as the Area of Operations West (AO West). In order to make better use of existing trucking assets, military truck operations for the exercise will be confined to AO West; commercial trucking also will be used there, as it would in an actual emergency. All materials handled in AO East will be moved by commercial trucks.

An important part of training at Golden Cargo exercises is the use of innovative technologies and new doctrine. During Golden Cargo '98, soldiers will use in-

novations such as the palletized loading system (equipment designed to offload ammunition quickly on the battlefield), Total Asset Visibility (a system of computer hardware and software designed to identify the exact location of critically needed supplies), and the Defense Transportation Tracking System (a global positioning system designed to track military convoys and other vehicles). These systems are still very new. They have been used in Golden Cargo only in the last 2 years.

Golden Cargo '98 also will feature a first for the exercise: deployment of a Force Provider package. Each package consists of pre-positioned life support equip-





ment, including tents, food service equipment, and laundry and bath equipment, as well as personnel needed to support that equipment. Force Provider, which can be tailored to support units of various sizes, is intended to replace some of the Army's traditional life support unit configurations. Force Provider will be used at an overnight point in Nevada for soldiers transporting materiel from Sierra to Toole.

Survival and security skills will not be ignored at Golden Cargo '98. Lane training exercises are planned, and MILES (multiple integrated laser engagement simulation) equipment will be used for realism. Operational

readiness exercises will be conducted for selected units. Overall, the exercise will be executed in a tactical configuration.

So, with bigger and better plans for even more realistic and innovative training, Golden Cargo '98 will maintain a proud tradition of training. If your unit ever participates in a Golden Cargo exercise, you can be sure that a top-notch training experience awaits you. **ALOG**

*Lieutenant Colonel Bob Krause, USAR, is the public affairs officer of the 19th Theater Army Area Command, Des Moines, Iowa. The photographs were taken by Private First Class John D. Shreck.*



# Contingency Contracting: Combat

**O**ur country's armed forces are deployed globally in many different types of operations and exercises. Supporting our forces with organic logistics assets and personnel is becoming increasingly difficult. To offset this deficiency, many host nation countries provide support that eases the burden on the logistics system. However, in many cases a country cannot or will not provide assistance, and the logistics system provides inadequate support. This is where contracting fills the void. The individual assigned to conduct deployed contracting is the contingency contracting officer (CCO).

The CCO is one of the most misunderstood assets used by a commander in operations and exercises. Doctrinally, the CCO position is designed to complement or supplement the logistics supply system and the host nation support system available to the deployed commander's forces. What is important to understand is that, particularly in many Third World countries, contracting becomes the only mechanism for providing logistics support because of the lack of available local support. A key component to a successful operation is the contracting support plan (CSP). Unfortunately, this often is a neglected segment of mission planning that later has impacts on the execution phase of an operation or exercise.

## Training and Developing the CCO

To better understand the CCO's functions and capabilities, it is important to review the developmental process of the CCO. The soldier in military occupational specialty 97A, Contracting and Industrial Management Officer, enters the acquisition work force in the eighth year of his career. The 97A can be assigned as a CCO or assigned elsewhere within the acquisition corps. If assigned as a CCO, the officer receives formal training through the acquisition branch and then is assigned at the corps or division level to support units during deployment. Additionally, the CCO will receive on-the-job training at the installation's directorate of contracting (DOC) or, in some cases, at the principal assistant responsible for contracting (PARC) office. In garrison, the CCO will receive hands-on training from the military and civilian personnel who support the unit on the installation. Along with this training, the CCO will participate with the assigned unit to conduct organizational training and planning for operations.

The CCO will assist the unit in developing the CSP. This is a required annex to the commander's operation plan (OPLAN) for any exercise or operation. With proper planning and integration of all required assets, a

well-planned CSP can identify shortfalls and correct deficiencies before deployment.

As the new CCO is "maturing," the PARC or DOC will try to shield the new officer for a period of time while he gains experience in contracting before he is required to deploy. The new officer also can be sent out with an experienced CCO on a deployment or exercise to gain experience in deployed contracting.

## Authority and Responsibility of the CCO

A CCO either deploys with the assigned unit or is tasked to support another unit through command channels. The CCO's chain of command is through the PARC and the head of the contracting activity. A situation that arises with the current system is that the executive agent, who is nominated by the theater commander in chief, may or may not be in the same command as the CCO. If the executive agent or joint task force commander is not in the same chain, then a parallel chain of command structure can exist for the CCO. This parallel chain of command causes a problem for the CCO because the contracting officer's authority is in the form of a warrant, which is issued through the contracting chain of command.

The warrant provides the legal basis for the contracting officer to obligate funds on behalf of the U.S. Government. This can lead to conflicts for the CCO in problem resolution. The CCO may find himself caught in the issue of warrant authority versus command authority. This situation typically leads to misunderstandings with the CCO and the contracting process. This is one of the doctrinal issues that is being staffed presently, but an immediate solution to the problem is that the contracting chain within the joint task force commander's command can issue a warrant. This action directly ties the CCO with the new contracting chain of command, thus avoiding a parallel command structure for reporting and advice.

The CCO assists the logistics personnel in fulfilling requirements in the predeployment and deployment phases of an operation. The CCO should work in concert with logistics personnel (S4, G4, and J4) and host nation support elements (S5, G5, and J5) to provide the commander with a comprehensive look at where supplies and services can be obtained to support the operation or exercise. If these assets are integrated early in the planning process, then the right questions can be asked to fulfill requirements. Additionally, these assets can assist the units in the development of a comprehensive requirements list. When it is determined that there is a



# Multiplier for the Commander by Major Eric C. Wagner

need for a given commodity and excessive lead time or lack of availability exists, then the CCO can purchase the item either locally or where commercially available.

When the CCO has had sufficient time to conduct vendor research, he may know immediately the location, availability, and cost of a requested item. When the CCO is integrated early in the planning sequence, he becomes much more flexible and responsive to the commander and to the fulfillment of customer needs.

## Deployment of the Team

The contracting officer can deploy autonomously or as part of a forward area support team (FAST). If deployed alone, the contracting officer uses an automated program to process purchase requests and contracts and forwards them to a designated finance office for payment. If the unit has a class paying agent in country, the CCO can use this individual to make cash payments. Legal advice will come from the U.S. Embassy or from the closest judge advocate general office. With larger deployments, the CCO will be supported in country by a deployed legal staff and a finance team.

The robustness of a FAST team depends on its mission, and the team can be tailored in several configurations. The team configuration should be included in the CSP, along with payment procedures that best support the commander and his needs while conforming with local business practices. The CCO will come into theater with a regional data base of vendors used in the past. This is extremely helpful in identifying vendors who can fulfill the unit requirements successfully. The CCO will take with him all automation and support equipment required to run a deployed contracting office.

Occasionally, the CCO or FAST will operate from the U.S. Embassy, using U.S. assets to provide contracting and financial support. Depending on the established command and control relationship, the individually assigned CCO or FAST will receive direction from either the chief of staff (preferred) or the senior logistician.

## Integration of the CCO's

If the Acquisition Corps can help customers to understand contingency contracting, then commanders, who are the senior customers, will be able to better employ this resource. Professional development courses, such as the senior noncommissioned officer courses, Combined Arms and Services Staff School, Command and General Staff College, and Army War College, are ideal targets of opportunity to update senior leaders on the functions and capabilities of contingency contracting. An

information campaign also can be conducted in the various professional journals that the branches publish. Up-to-date doctrinal manuals provide a formal avenue for increasing the understanding and awareness of other branches about contingency contracting. Unfortunately, many solutions take time, and we must pursue more immediate solutions that can be applied to expedite the learning process.

Commanders can assist the process by ensuring integration of the CCO cells down to the lowest operational level. Review of the CSP will provide a good indication of just how well contingency contracting has been integrated within the command. Additionally, rehearsing the CSP during exercise deployments or command post exercises ensures that supported units have adequate coverage. Drilling the CSP on an exercise allows for the identification of any deficiencies to the plan without actually sacrificing quality support to units that require the supplies or services.

The inclusion of CCO briefings during officer professional development (OPD) sessions will provide good informal discussion for the CCO and his supported units. This also brings the CCO out of the DOC and provides personal exposure to the unit. Ultimately, the CCO must shoulder the burden of increasing the understanding of contingency contracting functions within his or her own unit.

Proper integration of the CCO within an organization allows the commander increased flexibility and quicker reaction time during the deployment of U.S. forces abroad. This flexibility is translated into increased efficiency of forces in the theater of operations. Additionally, if the commander understands how best to employ contracting personnel, then he has increased his ability to overcome the obstacles that inevitably arise during any military operation. Contingency contracting is not the "end all" solution, but it is a combat multiplier the commander can add to his "kit bag."

**ALOG**

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# Joint Operations

A logistics management specialist shares his views on actions that

**W**e frequently hear about joint forces or operations. While he was still Chairman of the Joint Chiefs of Staff (CJCS), General John M. Shalikashvili published Joint Vision 2010, "...the conceptual template for how America's Armed Forces will channel the vitality and innovation of our people and leverage technological opportunities to achieve new levels of effectiveness in joint warfighting." But what is all this joint talk and what does it mean for the services? How will we be affected? What fundamental changes will be made? Or is Joint Vision 2010 just another catchy title?

## Considering the History of Joint Operations

To the uninitiated, joint operations and joint logistics are new concepts and quite unlike the individual service orientations. This lack of "joint" understanding is due to a limited knowledge of history and, to a lesser degree, the limitations of service education. All too often we want to cure the ills of today and tomorrow, but our knowledge of history is inadequate. Frequently, when we are faced with an urgent situation, we do not take the time to look for a precedent. As George Santayana said, "Those who cannot remember the past are condemned to repeat it." Or are we simply good at preparing for the last war? The trick, of course, is to prepare for the next war. This means we must do a better job of planning and preparation.

Actually, the idea of joint military operations is not a recent development. Even Alexander the Great had to plan for the resupply of the soldiers and animals (both cavalry and transport) of the Macedonian Army since they were not able to carry all they required for an entire campaign. He planned for his army to obtain food from the areas he conquered, either taking stored grains or harvesting them along the way when they were sufficiently ripe. This need for resupply in part determined the time and route of march (logistics impacting on the operational element). Because the logistics burden of supplying sufficient food, fodder, and water for his troops and animals could limit his progress, Alexander was forced to develop alternative methods of resupply. In today's context, Alexander's use of waterborne resupply would be considered joint logistics support.

Joint operations were conducted many times in our

own Civil War. For example, Flag Officer Andrew Hull Foote's warships helped General Ulysses S. Grant capture Forts Donelson and Henry on the Tennessee and Cumberland Rivers. In another operation, Admiral David Dixon Porter's ships assisted General Grant's capture of Vicksburg on the Mississippi River. The success of these land operations depended on naval operations. Successful as these operations were, they were not the result of a large, coordinated planning effort. When asked how Admiral Porter was to get his transports past the Vicksburg batteries, Grant's response was, "That is the Admiral's affair." Hardly what we would consider thorough joint planning, but it was effective at the time.

The Second World War provides more recent examples of joint operations and logistics. In the Pacific, General Douglas MacArthur relied on Admiral Chester W. Nimitz for delivery of his materiel requirements from the States. Nimitz controlled the shipping and was responsible for the Pacific Ocean area through which those supplies flowed. MacArthur commanded a joint force consisting of air and ground forces of the Marine Corps and Army, with naval support for landing operations, naval gunfire, and air support provided by carrier-based Navy and Marine Corps forces. All large-scale Pacific operations were conducted as joint operations, with all American services participating. Often these operations involved other countries (multinational).

In the European theater of operations, the Navy landed most invasion forces (including British and Canadian forces) and assisted with offshore naval gunfire. The Navy also was instrumental in transporting food, fuels, ammunition, and machinery of war from stockpiles in the United States and Britain to North Africa, Italy, and France. These large-scale operations also were usually joint or multinational.

In the decade of the 90's, our forces have been involved in Operations Joint Endeavor and Joint Guard, Desert Shield and Desert Storm, Provide Relief, and Restore Hope in addition to several Embassy relief and humanitarian efforts around the world. These operations have been performed by two or more services. In fact, former Vice Chairman of the Joint Chiefs of Staff Admiral David E. Jeremiah is quoted in Joint Publication 6-02, Joint Doctrine for Employment of Operational/Tactical

This article expresses views of the author, not the Department of Defense or any of its agencies.



# and Logistics Support by Peter J. Higgins

must occur to make joint operations and logistics support a reality.

Command, Control, Communications, and Computer Systems, as saying, "No matter where we fight in the future, no matter what the circumstances, we will fight as a joint team. We will have fingers on the team that are the individual Services, but when it comes to the fight we want the closed, clenched fist of American military power. The days of single Service warfare are gone forever."

This idea permeates the current National Military Strategy of the United States Armed Forces, which states, in part, that "Modern warfare requires US forces to fight as a joint team whether operating unilaterally or as part of an international coalition....Success in joint and combined military operations requires bringing to bear, at the right times and places, the unique and complementary capabilities of each of the Services."

In order to achieve this call to joint action, our forces must be prepared and trained in peacetime to successfully carry out this mandate. By extension, the clear intent is for the services to operate jointly while remaining organizationally independent. This requires that the four services prepare for that eventuality by organizing and training for joint operations. The Joint Training Analysis and Simulation Center (J-TASC), a subordinate element of the United States Atlantic Command is a beginning. More importantly, the knowledge of joint operations and joint logistics support for these operations must become part of each service's culture. It is essential that our service leaders believe this, endorse it, and make it happen, or Congress will change force structures and budget levels through legislative action.

## Planning for Joint Logistics Support

Joint Vision 2010 is the CJCS blueprint for the United States military. One of the four concepts on which this vision is based is Focused Logistics. To achieve Joint Vision 2010, logistics of the future must be "...responsive, flexible, and precise..." and "...enable joint forces of the future to be more mobile, versatile, and projectable from anywhere in the world." In order for us to get to this desired end state, the services need to endorse the concept of joint operations by wholeheartedly joining together to plan for joint support now. This means organizing in such a manner that the services will train and

operate together. More importantly, our doctrine must require joint support and our plans reflect it.

Shortly before this was written, the first report of the Quadrennial Defense Review (QDR) was issued. In part, it determined that "...U.S. forces must be capable of fighting and winning two major theater wars nearly simultaneously," achieved through "...stable investment in modernization in order to exploit the revolution in technology and to transform the force towards Joint Vision 2010." To help pay for the proposed shift toward the technologically advanced weapons of the future, the QDR report proposes cuts in the current force and infrastructure. In essence, the QDR is betting that smarter weapons will achieve future victories and the savings realized from reducing the force structure (active, guard, and reserve) and logistics infrastructure will pay for the technology.

It is impossible now to accurately predict the result of this QDR process. Congress will have a large role to play in revising the recommendations of the QDR. Ultimately, it is Congress that will resource the Department of Defense (DOD), decide on the force structure, approve major weapons programs, and approve additional base closings. These last two elements are highly politicized.

Two facts are certain. The President has indicated that the DOD budget will be at the \$250 billion level for the next several years, and Congress has shown no interest in raising that figure. The American public watched our success in the deserts of Kuwait and Iraq. They realize we have no major superpower facing us, and they want the peace dividend and the lower taxes it suggests. Additionally, the public has little interest in paying for a large military force with a program for weapons modernization. So the options available to DOD are limited.

The QDR points the way for obtaining modern weapon systems by reducing force levels and infrastructure costs while maintaining the \$250 billion DOD budget level. With fewer personnel and an unchanged threat level and operational tempo, the services need to change their practices and focus on operating jointly. They must increase efforts to plan, train, manage, and operate together. Each service must learn, understand, and appreciate each other's strengths and weaknesses as well as their own



ciate each other's strengths and weaknesses as well as their own so that the Joint Force enjoys synergy.

### **Making Joint Operations a Reality**

DOD's task is to develop a framework of a gile organizations and systems that are able to adjust to changing mission scopes and sizes. To accomplish this, we must develop the personnel who will make these organizations work and others (the trigger-pullers) who will test these systems in peace and trust them enough to use them in war. History tells us this second objective may be the harder to achieve.

Today we have forces in Bosnia as part of the coalition stabilization force enforcing the Dayton Peace Accords. We also have recent experience in Panama, Somalia, and Haiti; in the future, we will be involved in other joint and coalition engagements, the locations of which we can only guess. How will we support them? Indeed, how will we plan for and organize them?

How do we fund all of these requirements? These are tomorrow's IOU's if our forces are unable to train adequately for the future. The QDR was performed to determine the proper size and structure of our military and to enable us to modernize our aging weapon systems. It proposes reducing our active forces by 90,000 to 1.36 million, the Reserves and National Guard by 65,000 to 835,000, and civilian employees by an additional 80,000 to 631,000. The stated objective for these reductions is to cut costs without weakening the military's punch. According to General Shalikashvili, the recommendations "...can be accomplished with minimal impact on the combat force." That clearly makes the support forces and infrastructures the bill payers.

Cost reductions probably can be done, but we do not have many successful retrenchment efforts in our past, and history tends to repeat itself. The military was "downsized" after the "war to end all wars" in 1918. We entered World War II with some preparation because our support of Great Britain "warmed" our industrial base. While we won World War II, it was not quick, easy, or cheap. After World War II, we again reduced the size of our armed forces. After all, we were the only nuclear power, and we began to believe our press clippings. We were preeminent, and no one was eager to pick a fight with us—until Korea happened and we were unprepared again. We had inadequate forces in Korea and Japan, and American soldiers of Task Force Smith (an undersized, ill-prepared, stopgap U.S. effort to hold back North Korea until adequate U.S. forces could be mobilized and fielded) lost their lives while buying time for us to deploy forces to the area.

In the Gulf War, we had the political and military leadership that allowed our military to fight according to our doctrine, superior weaponry and soldiers trained to use it, and masses of materiel to support our force. Could

we have won without our coalition partners? Yes, but it would have taken longer, and perhaps Saddam Hussein would have employed a different strategy, making the task even more difficult. Certainly, no one expected Iraq to allow the coalition force several months to stage its invasion force. It is unlikely that future antagonists will be as accommodating.

Our success in the Gulf War ironically conveyed to many that no challenge was too great for us and that we had the capability to do it again. Many argue that, if a future enemy gave us the same amount of time, we could not repeat the buildup of the Gulf War. We must guard against the "last war" mentality. The last war is never representative of the next war. Change is inevitable, and it appears that change occurs more quickly now than in previous years as a result of technology.

So here we are. No superpower threatens us. The American public still wants a peace dividend. Our political leadership has promised a smaller military, yet that same leadership continues to employ U.S. forces overseas without requesting supplemental funding to pay the bills. This is an act worthy of Harry Houdini. But joint logistics and operations can be the magic that will allow us to succeed.

*Can it happen?* The simple answer is "yes." By developing joint doctrine, plans, and organizations, educating and training joint planners, having tacticians and logisticians working jointly, and developing joint weapon systems when it makes sense, we will be strengthened and ready for all challenges. The essential ingredients are American military personnel who are ready and willing to become "purple-suited." If each service does what it can do best, Joint Vision 2010 will work to our collective benefit.

*Can we make it happen?* Yes. *How?* Leadership! Leaders from different spectrums. We need national leaders who are willing and able to do what is right without political motivation. We need military leaders who are willing to take chances and risks by doing what they know is right and not caving in to divisive service rivalry. The trend seems to be positive. Our job is to make it happen without a reprise of Task Force Smith.

*Will it happen?* Stay tuned.

**ALOG**

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# Contracted Logistics in Bosnia

by Lieutenant Colonel Darrel A. Williamson, USAR

One of the success stories of Operations Joint Endeavor and Joint Guard in Bosnia-Herzegovina has been the evolution of contracted logistics support through the Logistics Civil Augmentation Program (LOGCAP). From its beginning in the early months of Joint Endeavor, through the transition to a new contract 18 months later, to the support it provides today, the contractor has been an indispensable part of the mission. Not only has the quality of support been exceptional, but using the contractor has augmented the military's ability to execute the mission, at reduced cost and without deploying thousands of logistics and engineer soldiers in the Balkans.

Obtaining support through LOGCAP is one of several tools available to the commander. LOGCAP, along with contingency contracting, assistance in kind, and host nation support, supplements the Army's wholesale supply system. It uses cost-plus contracts, which means the contractor is reimbursed for reasonable costs plus an award or performance fee. Commanders shouldn't use LOGCAP to buy supplies. LOGCAP's design allows contractors to provide services and perform construction jobs.

The responsiveness of the contractor and the contracting support provided by the Army Corps of Engineers Transatlantic Programs Center have been vital to the success of contracted logistics support in Bosnia. However, five actions taken in the theater have been critical to success: establishment of joint acquisition boards to control new work; creation of a transition mechanism for executing follow-on contracts; deployment of administrative contract officers; inclusion of the contractor on the command team; and institution of financial management tools to provide timely visibility of costs.

## Joint Acquisition Boards

A consistent review process, with well-defined limits for the expenditure of funds, was established at the start of the operation. This review process was conducted by joint acquisition boards (JAB's), which were established at both the intermediate staging base in Hungary and Task Force Eagle in Bosnia.

Each JAB consisted of five voting officers and as many nonvoting members as were needed to review each new project. The JAB validated the requirement for each project, reviewed the estimated costs to determine if the budget could cover it, and assessed alternatives before approval. This process occurred

weekly, or more frequently if special requirements arose that needed immediate action.

The approval authority was limited at various levels by the amount of dollars that could be spent on a project. The chief of the Base Camp Coordinating Agency (BCCA) was authorized to spend up to \$1,000; the JAB could approve any project up to \$25,000; and the commander of the National Support Element and Task Force Eagle had an approval authority up to \$50,000. The U.S. Army, Europe (USAREUR), Principal Assistant Responsible for Contracting is the theater contracting commander and policy advisor for the USAREUR JAB. Any spending requests over \$50,000 involving the contractor, Brown and Root Services Corporation (BRSC), had to be approved by the Office of the Deputy Chief of Staff for Logistics (ODCSLOG), USAREUR. All of the organizations involved in the process needed to communicate constantly with each other to ensure that all requirements were understood.

## Transition to Follow-on Contracts

The original LOGCAP contract, awarded to BRSC and managed by the Corps of Engineers, came up for renewal in 1997. Following a competition, DynCorp was awarded the contract under the management of the Army Materiel Command. However, to maintain continuity of support, it was decided to stay with the same management team for Joint Guard. So a sole-source contract was awarded to BRSC to continue its logistics support, with management provided by the Corps of Engineers Transatlantic Programs Center. The transition from the LOGCAP to the "Operation Joint Guard Sustainment" contract in May 1997 went smoothly and was invisible to troops in the field.

Theater oversight and management of the contract was provided by the USAREUR ODCSLOG. As the theater evolved to the sustainment phase under Operation Joint Guard, the mission changed from building base camps and getting soldiers out of the mud to improving living conditions and maintaining facilities and operations. The contractor focused on continuing the normal, day-to-day activities of feeding, sheltering, and clothing the troops and performing unprogrammed work. An example of unprogrammed work was upgrading tents. When the tents started to deteriorate after over a year in use, an extensive effort was undertaken to repair or replace the canvas or build Southeast Asia-designed buildings ("sea

This article expresses views of the author, not the Department of Defense or any of its agencies.



□ Brown and Root Services Corporation constructed sea huts at Camp Danger Forward in Bosnia (right). They also operated this maintenance facility in Bosnia, maintaining and repairing both tactical and nontactical vehicles (below).



huts") instead of acquiring new tents.

The composition of the contractor team remained relatively constant throughout the mission, but the military and Government civilian teams managing the contract rotated on 6-month tours of duty. Units also rotated in and out of the theater. This turbulence caused some confusion for both the contractor and the Government teams. The result was some loss of continuity, since each new team had to learn what agreements and procedures had been established. Fortunately, the award of the Operation Joint Guard Sustainment contract allowed for procedures and processes to be reestablished; lessons learned could be applied in restructuring some old processes.

#### Administrative Contract Officers

Problems developed when military leaders who were not familiar with the contracting process and the specifications of the sustainment contract attempted to direct the contractor to perform work. In some cases, leaders believed the contractor should respond to fragmentation orders as the military would. In Joint Guard, the Defense Contract Management Command (DCMC) was tasked to provide contract administration through two deployed teams, one in Hungary and one in Bosnia. An administrative contract officer (ACO) was deployed to each location to work with the contractor and issue notices-to-proceed or stop-work orders. In addition to the ACO, each DCMC team had personnel to administer the contractor's property and quality assurance personnel. These teams were instrumental in administering con-

tractor activities and working with USAREUR.

To educate military leaders on working with contractors in the field of operations, DCMC personnel provided information to the leaders and staffs on the contractor's mission and purpose. Some senior leaders were not even aware of the ACO's and their role in contract administration. The commander of the DCMC teams realized that more open communication was needed, so he organized management councils with key leaders in both Bosnia and Hungary. Council meetings provided leaders with insights on the operations performed by the contractor and strengthened communications among the command staff and contract administrators.

#### Conferences With the Contractor

Headquarters USAREUR organized and executed planning conferences to keep the contractor informed about long-term and mid-term planning. The quarterly conferences pulled together the resources of the USAREUR staff and provided a comprehensive view of the operation. These conferences allowed the contractor to plan for surges in the rotations of units and to perform long-term planning for closing base camps and terminating operations. When events such as the local Bosnian elections caused an increase in the need for support, the planning conference was the tool for informing the contractor so it could plan the use of its resources.

#### Financial Management Tools

Tracking where money is being spent is the area of the operation that contract managers scrutinize most care-





fully. However, contract managers in Bosnia soon discovered that the cost reports generated by the contractor, as specified in the contract, did not meet their needs. So USAREUR developed a new report to track costs by base camp.

When reviewing the alternatives for new work projects, the costs of using reserve component soldiers, transporting troops, and other factors had not been considered. This created the false impression that military resources were cheaper than local labor. To determine the least costly alternative for a project, a full cost evaluation was essential.

The contractor on the ground used local labor. The contractor constantly was required to provide a rough cost estimate, called the rough order of magnitude (ROM), from which the JAB could determine the relative cost of a project. Unfortunately, most officers believed the ROM was a firm cost estimate; they also failed to realize that each ROM added to the cost of the contract.

The JAB's were needed to control requests for unnecessary projects and find lower cost alternatives. The JAB's were able to look at the labor mix and provide a review of who was available to perform the tasks. The contractor was one of many resources available; contingency contracting, host nation support, and military labor also could be used. For each project, the JAB could require a review of alternatives and approve the project (or recommend it for approval), or they could table the project for further review.

Teamwork is the key to success. The contractor must be considered part of the military team and included in all planning and training. Military leaders need to understand the rules and conditions of working with the contractor as part of the force. The contractor needs to be responsive to the customer and aware that it provides the support for the force.

Units that will use the LOGCAP contractor should fund and include contractor personnel in exercises. Liaison and management teams consisting of two or three officers should be established to provide a single point of contact for the contractor, DCMC, and supported units. Finally, the contract review process needs to be initiated, based on an understanding of the contracts used to support the operation.

**ALOG**

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# Logistics Improvisation

by Major Kent S. Marquardt, Captain Tom L. Clady, and First Lieutenant David Connolly

*Note: This article describes the authors' experiences in a training exercise and identifies a few problems that participants experienced during the rotation. Subject matter experts in the Army Office of the Deputy Chief of Staff for Logistics reviewed this article and provided up-to-date information regarding some of the issues. Their comments appear in brackets immediately after the problem descriptions.*

**T**he 2d Armored Cavalry Regiment (ACR) Regimental Combat Team (RCT) achieved two firsts at the National Training Center (NTC), Fort Irwin, California, in rotation 97-03, Desert Saber. This was the first assemblage of the 2d RCT since its return from the Federal Republic of Germany in 1992, and this was its first combat training center rotation.

Although all of the RCT learned many lessons during Desert Saber, this article will focus on the 142d Corps Support Battalion (CSB) as a logistics task force providing corps-level support to the 2d RCT. The 142d CSB assembled an adequate support structure in less than 60 days, deployed the 142d CSB headquarters, integrated support elements into a doctrinal CSB (Forward), field-tested a new palletized loading system (PLS) truck company, planned and provided force protection, and, most importantly, came back with lessons learned that will prepare the RCT and other echelons-above-division units for combat.

## Background

A cavalry regiment rotation through the NTC is fundamentally different from a brigade task force rotation. In combat, a cavalry regiment, even in an economy-of-force role, receives a great deal of assistance from its parent corps in lieu of corps support and has more wide-

ranging missions to complete over a wider range of territory than a comparably sized brigade. These considerations, combined with the fact that the 2d ACR is the only "light" (all vehicles are wheeled) cavalry regiment in the Army, increased the stress on all of the usual relationships.

The regiment's challenge was to bring together all of its combat elements for the first time. The 2d RCT's combat power stems from its organic tube-launched, optically tracked, wire-guided (TOW) missiles and 50-caliber M2 machineguns mounted on high-mobility, multi-purpose wheeled vehicles (HMMWV's); task-organized (organic and non-organic), 155-millimeter field artillery support (a total of 64 tubes); and a squadron of Kiowa Warriors (OH-58D helicopters).

## Operations

The 142d CSB logistics task force established operations for Desert Saber on 23 November 1996. The initial mission was to assist the 2d RCT in building combat power in the country of Mojave and to set up reception, staging, onward movement, and integration to prepare for offensive operations. When the squadrons were ready to move forward, the 142d ensured that the RCT had all the help it needed to send fully equipped and supplied units into the initial engagements or assembly areas. The 142d assumed responsibility for drawing, processing, and moving all classes of supplies forward to the regimental support area. Then the regimental support squadron attached seven 5,000-gallon JP8 tankers and two 5,000-gallon water haulers to the 142d to enable the logistics task force to "push" fuel and water to the regimental support area.

The units that made up our support team quickly assumed their individual responsibilities. Within a matter of days, the task force was working at full capacity by



# in Desert Saber



providing life support to the regiment in the form of supplies, fuel, maintenance, transportation, and medical support.

The 142d logistics task force ran its operation out of the "Dust Bowl," the name used to describe the corps support area, pushing supplies to the regimental support area, and, in many instances, pushing supplies far forward to the user. Corps throughput often was necessary, with large quantities of class IV (construction and barrier materials) and class V (ammunition) supplied directly to the squadrons and battalions. The total process involved picking up the supplies from the theater supply point and moving them some 60 miles to the using units. The PLS company found itself driving over 25,000 miles in all types of conditions, such as darkness, rain, and windstorms.

## Palletized Loading System

The PLS was, without a doubt, the most important logistics asset on the NTC battlefield. On a daily basis, at least ten PLS's would move the entire RCT requirements of all classes of supply, usually in about half the time required for transport by the stake-and-platform trailer or lowboy. Many of us had our first experiences with the PLS during this exercise. The 603d Transportation Company had converted to PLS in the previous 6 months, so all of the drivers were having their first field exercise with the PLS system. Some lessons learned about the PLS follow—

- Although the PLS was fielded for hauling ammunition, there are many other uses for this versatile piece of equipment, such as carrying refrigeration vans, class I (subsistence) and class IX (repair parts), or loose cargo (using sideboards).

- Fuel capacity limits the range of the PLS to about 200 miles off road and must be carefully considered be-

□ The PLS truck (above) races across the desert during LOGPAC operations at the National Training Center.

fore assigning missions. *[An 85-gallon auxiliary fuel tank has been added to the PLS since the time of this exercise. The additional fuel will extend the range to approximately 300 miles over broken terrain.]*

- About one-fifth of the fleet was not mission capable each day. The majority of these deadline faults dealt with parts covered by manufacturers' warranties. Unfortunately, warranty guarantors do not work on weekends and holidays. *[The PLS contractor schedules a representative to be at Fort Irwin 7 days a week. The PLS program manager is collecting data on the types of parts ordered, how orders were placed, and how problems were reported.]*

- The tires are not as sturdy as they look. Replacing flat tires was both an availability issue and a financial concern for the unit. A tire costs over \$1,000 and cannot be purchased locally.

- Any type of operational security, such as noise control, is almost impossible when towing a trailer. The metal-on-metal banging can be heard for hundreds of meters. *[The PLS program manager is investigating this problem.]*

- Towing rings on the trailers often are bent when trailers are backed up and reconnected to the prime mover. We destroyed many towing pintles by what the manufacturer called "driver fault." We believe that it is a design flaw. Whatever the cause, drivers must know how to back the tandem trailer properly. Also, the turning radius of the PLS is much larger than that of other



vehicles, and this fact must be considered when plotting routes and designing facilities. *[A backing assist device currently is being tested and should be available for installation on the PLS in the near future.]*

- Flatrack accountability on the battlefield is a nightmare. Doctrine must be developed to account for where the driver drops a flatrack and how to recover it properly. *[The flatrack accountability problems will be relieved significantly with the addition of the movement tracking system and future RF tagging programs.]*

- Force protection for the system is a challenge. Often we had pairs of systems traveling around the battlefield because of the type of mission, such as throughput to a forward class IV supply point or ammunition transfer point. Also, the PLS is so versatile that it is easy for the supported unit to commandeer a PLS for its own use. It is essential that each PLS on the battlefield can defend itself and is equipped with a communication system. The modification table of organization and equipment should be changed to add to each PLS a crew-served weapon, such as the M249 squad automatic weapon or ring-mounted 50-caliber M2 machinegun, and a single-channel ground and airborne radio system (SINCGARS).

### PLS Initiatives

The container-handling unit was invaluable in handling loose cargo. This attachment to the PLS can load and unload a 20-foot MILVAN without a flatrack. The 603d had a prototype that was fielded for testing and evaluation. It came in very handy for hauling many loose items like mail, parts, and class II (clothing and individual equipment) items.

We manufactured sideboards for this rotation, and the PLS performed much like any other bulk cargo hauler. The only limit to the sideboards is that the cup holders for the stakes are too shallow. A great product improvement would be pins in the cup holders to hold down the stakes or deeper cup holders. In any case, we used ratchet straps to hold the sideboards in and were able to haul classes II, III (Packaged), V, and IX supplies as well as other cargo, including mail.

### Force Protection

Force protection was a priority throughout the rotation. In the corps support area, bunkers and a consolidated quick reaction force were employed to defend against level one threats. For convoy defense, we took the following steps:

- Situational training exercise lanes were conducted by the companies before the rotation.
- Pre-combat inspections, rock drills, backbriefs, and rehearsals were conducted before all convoys.



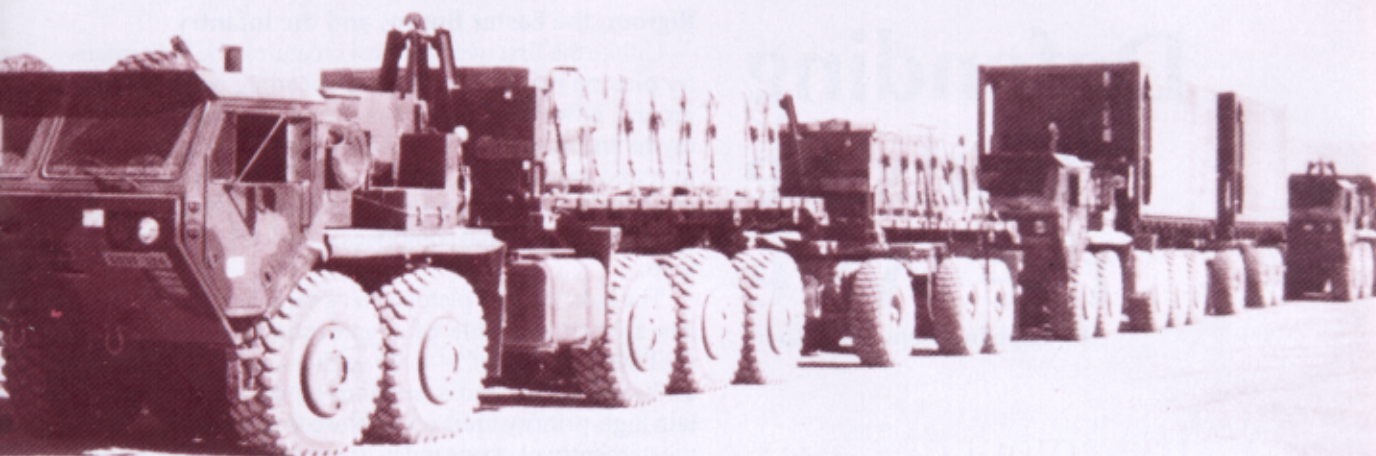
- Military police and aerial route reconnaissance support were coordinated whenever possible.
- Continual use of intelligence enabled us to brief convoy commanders before every movement.
- We made comprehensive use of communications assets. A relay station was used when required.
- Weapons were zeroed daily using the multiple integrated laser engagement simulation (MILES) system.

Because of these preventative steps, the logistics task force had very few casualties during the rotation, both in the simulated battle and the real world. We accomplished our commander's intent through careful planning and smart execution, such as by using the NTC risk assessment for every mission.

### Lessons Learned

The echelons-above-division task organization for the NTC is usually an ad hoc organization built around support of the brigade task force or, in this case, the RCT. We brought together many corps "slices" to support the RCT and still found ourselves short in the areas of materiel management and movement control. Additionally, a more robust ammunition element and a PLS company (+) will be required to support future RCT rotations at NTC due to the amount of field artillery (sixty-four 155-millimeter tubes) requiring resupply. The recommended task organization for the logistics task force would include the CSB logistics task force; a headquarters and headquarters detachment; a supply platoon; a petroleum, oils, and lubricants platoon; a shower, laundry, and cloth-





□ The PLS was used extensively to transport all classes of supplies, including these meals, ready to eat, during Desert Saber.

ing renovation team; a direct support maintenance company (nondivisional); a transportation company (PLS) (plus one additional platoon); an ordnance company (maneuver-oriented ammunition distribution system); a corps materiel management center (-); a movement control team; and a medical element.

The 2d RCT's first NTC rotation was not planned or resourced, at least as far as echelons-above-division support requirements were concerned, until less than 60 days before the exercise. This was quite a challenge for the command and control headquarters. A 1st Corps Support Command initiative will remedy this with logistics planning conferences and backbriefs to the regimental command group starting 180 days out. This will ensure that the appropriate support package is in place.

The 2d RCT and 142d CSB's first rotation at the NTC was a tremendous training and logistics event. It validated that the 2d RCT can perform its mission in accordance with Field Manual (FM) 17-95, Cavalry Operations (Final Draft, February 1996). It proved that logistics anticipation is imperative to ensure the agility of light cavalry operations. That means plans and capabilities must be versatile and mobile enough to accommodate the fast pace of the battlefield.

Additionally, logistics improvisation plays an important part in cavalry operations. The corps-level logistics units supporting the cavalry must use improvised techniques, such as the PLS, the container handling unit, and PLS sideboards to deliver commodities far forward where they are needed. The Army must continue to

improvise and anticipate by developing force protection, communication systems, tracking doctrine, and equipment that will enable corps-level logisticians to support the light cavalry. This is especially true for a light cavalry unit that provides a wide range of missions on a fast-paced battlefield.

**ALOG**

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# Defending Outside the Wire

by Captain Joseph S. McLamb

The author discusses how using the light infantry platoon in the brigade support area offers some unique advantages to the forward support battalion commander.

If you ever have been responsible for the security of the brigade support area (BSA) at a combat training center, chances are you have wished for some infantry to help you in this sizable task. It is also likely that, if you asked for such help, you got a lengthy explanation of why your request would not be granted, an explanation that probably included a discourse on the proper use of the light infantry.

There are times, however, when the BSA *does* receive infantry augmentation. Some people see this as an appropriate solution to a difficult problem, while others view it as a misuse of combat power. My purpose is not to discuss the relative merit of either perspective, but to offer some insight to the forward support battalion (FSB) commander, executive officer, or S3 who finds a light infantry platoon at his disposal when formulating the BSA security plan. To do this, I will review what you are likely to find in today's light infantry platoon, discuss the standard use of a platoon in the BSA, and offer an alternative for it that may be more appropriate in some scenarios.

## Bigfoot, the Easter Bunny, and the Infantry

Unlike the first two mythical creatures, the light infantry platoon really does exist. Depending on your background, however, you may have been exposed to several myths and misconceptions about the platoon's composition and capabilities. Before we discuss how we can employ the platoon, let's take a minute to make an accurate appraisal of what comprises the average infantry platoon.

The light infantry platoon, in its various configurations, has a modified table of organization and equipment (MTOE) strength of 34 to 40 soldiers, usually organized as 3 rifle squads and a weapons squad. Although certain high-priority units come close to meeting that ideal, most infantry platoons today are capable of fielding only 20 to 25 personnel for training, usually organized as 2 rifle squads and 1 weapons squad. The platoon normally will man two M60 machineguns, four to six squad automatic weapons, and enough PVS-4's (individual weapon night sights) and PVS-7's (night-vision goggles) to provide almost every soldier with some type of night vision device. Additionally, many leaders will carry the AN/PAQ-4 infrared aiming device.

Although the training level of the platoon will vary from unit to unit, almost all infantry platoons are competent in the standard infantry tasks, especially the battle drills that make up the majority of platoon operations. Many light infantry units spend most of their training time on offensive tasks, but platoons are generally competent in defense as well. A platoon's defensive experience often will be limited to defending from a battle position, normally as part of a larger defense.

In theory, the platoon has a significant antitank capability in the form of either an organic two-team Dragon antitank missile section (air assault and airborne units) or an attached section from the company anti-armor section (light infantry units). Reality is often something less, however. Due to manpower shortages, a platoon with dedicated Dragon gunners is rare. The more common situation is for the platoon to have two or more soldiers who are Dragon-qualified but perform some other duty the majority of the time. To be effective against armor, the platoon requires significant additional assets, such as mines and construction materials, that allow the platoon to set the conditions for success. If the platoon leader appears hesitant to fight tanks under most conditions, he has reason to be. The light infantry platoon rarely enjoys success in a meeting engagement with armor.

The platoon leader will, in most cases, be serving in his first duty position since entering the Army, and his experience level will be low. Although the Infantry Of-



ficer Basic Course will have prepared him for operations at the infantry platoon and company levels, you can rest assured that he has little or no understanding of what an FSB does, what a BSA looks like, or how he fits into the operation. Unless the platoon happens to have a non-commissioned officer with staff experience, the odds are good that no one else in the platoon has any better understanding of life behind the infantry battalion rear boundary. Devoting some time to briefing the platoon leader on BSA and FSB operations may well be your first order of business in using an infantry platoon.

Perhaps the most important feature of the light infantry platoon is that it is not afraid to operate by itself. While platoon leaders are taught to make use of all available combat multipliers, much of their training focuses on fighting as a platoon. You will find little hesitancy among platoon leaders to operate away from other friendly units.

The infantry platoon brings a considerable amount of combat power to the BSA. It can be employed quickly and can adapt to various situations effectively. Augmented with dedicated transportation, the infantry platoon can respond to threats over a fairly large area. It does have its limitations, however. To get the most out of a platoon attached to the BSA, you should recognize those limitations while capitalizing on its capabilities.

### **The Infantry Platoon as QRF**

The most common use of the infantry platoon by the FSB is as a quick-reaction force (QRF). In this capacity, the platoon is located somewhere near the center of the BSA, given some type of transportation, and told to monitor the command net for instructions. In the best units, the platoon leader receives a detailed brief of the enemy situation from the S2 and an accurate sector sketch of the BSA perimeter (to include observation posts, obstacles, early warning devices, patrol routes, planned indirect fires, fighting positions, sectors of fire, and so on). He meets with each element that is responsible for a portion of the perimeter and takes a walk around the perimeter with the S3 or his representative.

Using the infantry platoon as a QRF offers a number of clear advantages. First, it provides the commander with a significant combat force that is available to respond immediately to unforeseen enemy action. In most cases, a QRF platoon can react to an enemy attack within minutes; if provided with dedicated transportation, the platoon can move anywhere inside the BSA very quickly. Second, it eliminates the requirement for the BSA to dedicate personnel to form a QRF. It does not, of course, eliminate the need for forces dedicated to security along

the perimeter. Finally, using the infantry platoon as a QRF offers the commander an internal capability to defeat level II threats (threats that are beyond base or base cluster self-defense capabilities, such as sabotage, raid, and ambush). This capability is especially important when we consider current practices at the Combat Maneuver Training Center in Hohenfels, Germany, where at least 50 percent of brigade commanders use their military police platoon for something other than BSA security. Using a light infantry platoon as the QRF provides the commander with an "ace in the hole."

There are several disadvantages to this technique, however. The most serious of these is that contact between enemy and friendly forces will occur at the time and place of the enemy's choosing; the enemy retains the initiative, while the friendly forces are committed to a reactive role. A second major disadvantage is that even a successful reaction by the QRF will rarely prevent the enemy from accomplishing his assigned task. A recent study at the National Training Center (NTC), Fort Irwin, California, revealed that enemy attacks on the BSA during 6 rotations resulted in 450 friendly casualties and the loss of 93 pieces of equipment. The primary reason for these losses was that enemy forces were already within range of their BSA targets (equipment, troop tents, etc.) *before* they made contact with the BSA defense. Given a successful reconnaissance before an attack, the enemy will often accomplish his goal before the QRF arrives, then slip away as the combat power begins to arrive. A final disadvantage of this technique is that it fails to capitalize on the unique capabilities of the light infantry. A predesignated force of BSA personnel, given some opportunity to train together in advance, can be as effective a QRF as an infantry platoon. Indeed, that is the solution to BSA security offered by the Army's primary doctrinal reference on this subject, Field Manual 63-20, Forward Support Battalion.

Is there a better way to employ an infantry platoon as part of the BSA security plan? Yes. Although at times the enemy situation will make holding the platoon as a reserve the best solution, finding the best course of action often will require an FSB S3 to look beyond the perimeter of the BSA.

### **Thinking (and Operating) Outside the Wire**

Say, for example, that while conducting their intelligence preparation of the battlefield, an FSB commander and his staff determine that there are four likely dismounted avenues of approach for enemy personnel intent upon attacking the BSA. Based on further analysis, the commander prioritizes the avenues, and the S3



places a remotely monitored battlefield sensor system (REMBASS) string on each of the two routes most likely to be used by the enemy. He tasks the infantry platoon to place observation posts on the remaining two avenues.

Having coordinated a passage of lines through one of the BSA tenant units, the platoon leader moves his platoon outside the wire, placing his platoon roughly in the center of mass between the REMBASS sensors and the BSA (probably 500 to 3,000 meters from the BSA perimeter if the terrain is similar to that at the Joint Readiness Training Center, Fort Polk, Louisiana). Employing some portion of his force to man the required observation posts, he uses the remainder of the platoon to patrol his area of operations. Much to the pleasure of the S2, the patrols soon pick up signs that the enemy has been using one of the potential avenues of approach, and the platoon assists the REMBASS team in realigning the sensors based on this intelligence. The platoon leader picks ambush positions along each avenue of approach and rehearses occupying them in both daylight and darkness.

At about 0330 the next morning, the REMBASS sensors detect movement along one of the avenues of approach, and the platoon leader moves the majority of his force to the pre-established ambush position. Forty-five minutes later, the enemy squad walks into the platoon's engagement area and is destroyed by antipersonnel mines and small arms fire. Among the casualties, the platoon finds documents indicating that the enemy squad was assigned to destroy the classes IV and V yard (construction materials and ammunition), which had been expanded recently in preparation for a brigade deliberate defense. Based on this information, the FSB commander realigns his perimeter to strengthen the area around the classes IV and V yard. The platoon resumes its patrolling and observation post operations.

Later that afternoon, the enemy does the unexpected. An assault helicopter inserts a squad north of the BSA. Unfortunately, the S2 had not foreseen this type of operation, and the landing zone is not covered by observation or fire. By the time a reacting force arrives at the landing zone, the squad and the helicopter are gone.

Two hours later, the enemy squad hits the classes IV and V yard from the east. Thanks to the intelligence gleaned from the earlier contact, the perimeter is strong enough to beat off the attack with only minor loss of stocks. As the QRF, which is made up of BSA personnel, begins to counterattack, the enemy squad breaks contact and moves to the south, determined to wait for the cover of darkness before returning to its high payoff target.

By this time, however, the infantry platoon has massed and begun moving to the action. When reports from the BSA indicate the enemy is moving south, the platoon

leader conducts a hasty intelligence preparation of the battlefield and determines the best place for an ambush. Within minutes of establishing the ambush, the platoon is rewarded by seeing the enemy squad move into the engagement area, still dragging two casualties of the firefight at the BSA perimeter.

Sound a little *too* easy? You're right. For the sake of example, this vignette ignores a key element of combat—friction. But this idealized portrayal of the concept does provide us with a tempting look at what is possible when a friendly infantry platoon operates outside of the BSA perimeter, but inside the BSA defense plan. Before we move on to discuss the likely friction points in such an operation, let's weigh the advantages of this technique.

The greatest advantage lies in taking the initiative from the enemy. Denied the "free ride" to the BSA often experienced by unopposed enemy squads at the combat training centers, our enemy finds the area around the BSA fraught with danger. His opponent is not tied to the facilities around the BSA and can show up anywhere. Combat is likely to occur in a location and at a time that places the enemy at a distinct disadvantage—not at all the type of combat envisioned by leaders intent on striking the "soft" rear echelon forces.

A second major advantage of having the platoon operate outside of the BSA perimeter is that it provides the S2 with a reliable source of information about enemy activity around the BSA. With named areas of interest provided by the S2 or S3 to guide his efforts, the infantry platoon leader can become a major provider of information, allowing the commander and S2 to revise their concept of the enemy's most likely course of action. No longer does the S2 have to wait for the enemy to make contact with the perimeter to get reliable indicators of his intent.

Finally, using the infantry platoon outside the wire capitalizes on the strengths of the infantry. Patrols, ambushes, and observation post operations are the "bread and butter" of the light infantry. Assigning an infantry platoon to patrolling duties is much the same as throwing Brer Rabbit back into the briar patch.

## Intelligence

The S2 will likely find his intelligence preparation of the battlefield process more stressed than ever as the infantry platoon leader asks for directions in his initial search for the enemy. Simply telling a platoon to look for the enemy in a vaguely defined area will rarely reap the desired benefits. The platoon has to be directed in its searches, and the directions must be based on a logically sound concept of the enemy's most likely course of action. Once contact is made, the S2's stress level will likely increase dramatically as the platoon attempts to get



inside the enemy's decision cycle and maneuver for an advantage. There will be little opportunity for the S2 to hedge his bets or offer only a rough idea of the enemy's actions. His assessment of the enemy has to be quick and accurate.

### **Maneuver**

As with any operation that offers success, there are costs associated with placing an infantry platoon outside the BSA perimeter. The battle staff will find that using a maneuver force requires considerable forethought and energy. But a unit willing to invest the time and energy required can enjoy a significant payoff.

One area that can cause problems if not addressed by the S3 is maneuver graphics. The platoon needs maneuver graphics to direct its activities and limit the chances of fratricide. The hand-wave technique of providing the infantry platoon with an area of operations is a recipe for disaster. Some items that normally should be included in maneuver graphics are platoon boundaries, passage points for exiting and reentering the BSA perimeter, planned fires, locations of friendly units outside the BSA, any tactical obstacles in the rear area, and locations of friendly sensors. The platoon should not carry an overlay with this information outside of the BSA, but this information is critical for the platoon's planning.

Another activity worthy of attention under the maneuver battlefield operating system is rehearsal. Observer-controllers who work with the BSA on a regular basis at combat training centers recommend a rehearsal of BSA defense actions. Incorporating the infantry platoon into such a rehearsal will reduce greatly the difficulties the platoon encounters. Having the infantry platoon rehearse passing out of and into the perimeter usually will prove useful.

Finally, remember that enemy forces will not sit idle once they recognize the threat of the infantry platoon. Experience indicates that the times and locations of patrol routes, patrol bases, and passage into and out of the BSA should be varied so as to present no discernible pattern. The goal is to catch the enemy by surprise and prevent him from fighting on his own terms.

### **Fire Support**

Infantry units require reliable and responsive fires to be successful. The challenge for the FSB staff is to develop a method of rapidly and accurately clearing fires in the brigade rear area. A frame of reference is important here: spending 2 minutes clearing fires may seem insignificant to the battle staff, but 120 seconds can be decisive in a contact with the enemy. The staff has to tie the infantry platoon into the indirect fire plan, allocate resources to the platoon, and maintain a firm understand-

ing of where friendly units are on the battlefield. The platoon must register its planned fires and participate in the BSA fire-support rehearsal. Failing to take any one of these actions will hamstring the platoon at the most critical time of all—contact with the enemy.

### **Command and Control**

During a recent 6-month period at the NTC, enemy contacts in the BSA resulted in an average of four fratricides per contact. Adding a maneuver force outside the BSA perimeter increases the chances of friendly fire incidents. Therefore, the burden on the staff to track friendly units and accurately direct operations against enemy forces will be severe. Only a staff that regularly practices the skills of battle-tracking will be successful.

### **Combat Service Support**

Supporting a light infantry platoon poses no problem for a BSA. One thing is required for success, however. Someone must be responsible. The infantry platoon sergeant is usually quite adept at making the platoon's requirements known, but he needs to have a single point of contact for support. Remember that, in all probability, no one in the infantry platoon has an understanding of what the various companies in the FSB do or who is responsible for the various supplies and services provided in the BSA. Assigning the platoon a single point of contact will greatly reduce the effort required to keep the platoon running.

### **Striking a Balance**

Using a light infantry platoon outside the BSA perimeter to take the fight to the enemy offers unique advantages to the FSB commander. It also requires a high level of staff proficiency and effort. In the first hours of occupation, when the enemy situation is very difficult to determine, the commander may want to hold his infantry close at hand. If the enemy threat has escalated to an armor attack, an independent infantry platoon may offer little hope for success. Somewhere between those two scenarios, however, lies an opportunity for the infantry platoon, operating against the enemies of the BSA before they arrive at their target, to enhance BSA security significantly.

**ALOG**

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# Team Building in the Army Workplace

by Steven L. Butler

**O**n 1 March 1997, the Directorate of Contracting (DOC) at Fort Riley, Kansas, implemented a "team concept" approach to conducting its business. The plan called for restructuring the DOC from a traditional organization of two or more separate divisions, each assigned specific tasks to perform, into a work environment that uses three "teams," each with as many as eight members, to conduct all contracting tasks. Each team member will gain the skills and knowledge needed to handle not only his usual tasks but also tasks normally executed by other employees. DOC employees believe that this new method of working will improve the quality, efficiency, and timeliness of the support they provide to their customers.

The restructuring that is occurring at DOC is very similar to the changes in labor-management relations throughout the Government resulting from Executive Order 12871, which was signed by President Clinton on 1 October 1993. That order established the National Partnership Council, composed of several Government and labor union officials, to advise the President on labor-management issues. Among other things, it is responsible for "supporting the creation of labor-management partnerships" in order to improve flexibility in the executive branch. Even though the activities of both the labor-management partnerships called for under the executive order and the teams envisioned under the team concept are similar, they should not to be confused with each other because they are found at different levels within an organization.

My colleagues and I surveyed the views of management, employees, and union officials at the Fort Riley DOC to see how well teaming is working. We found that the outlook for establishing a team concept there is good.

## Fort Riley Creates a Partnership

At Fort Riley, the 1st Infantry Division (Mechanized) and Local 2324 of the American Federation of Government Employees (AFGE) agreed on a partnership arrangement in 1994. The agreement called for new ways of conducting business and fostering new relationships among managers and workers, including mutual respect

and understanding, cooperation, decisions based on consensus, and joint training. Establishing the partnership was expected to result in—

- A high quality of service and products as part of mission accomplishment.
- Training in alternate dispute resolution for both labor and management (defining disputes in terms of "win-win," rather than "win-lose," situations).
- Open lines of communication between management and labor.
- Elimination of barriers to enhance productivity.
- Recognition of employees as assets who deserve a worker-oriented workplace.

The Fort Riley DOC reorganized its partnership committee into teams in March 1997. The DOC's objective is to establish and streamline internal procedures and policies while simultaneously working with fewer personnel. In addition, DOC must reduce the time needed to process purchase requests and other acquisition requirements while ensuring customer satisfaction and work quality. Accordingly, DOC developed a reorganization strategic plan and submitted it to higher headquarters before implementation. The plan had the following components: the requirements for successful teamwork; the DOC vision; a revised DOC mission statement; development of initial team goals and objectives; and development of DOC operating principles and ground rules.

The DOC partnership committee now consists of one employee from each team, the team chiefs, the union steward, and the director of contracting. The committee addresses issues raised by the work force and distributes minutes of its meetings to employees by e-mail. Unresolved issues are addressed at the next month's meeting. Issues are resolved on the basis of what is best for the directorate, which is determined through a combination of the committee members' consensus and the director's decisions.

## Implementing the Team Concept

According to author Mark Sanborn, a team is an "energetic group of diverse individuals who are committed to achieving common objectives, who work well together,



## Teams and partnerships are revolutionizing the American work environment.

### Fort Riley's Directorate of Contracting offers one example of an Army organization that has turned to teams to conduct its business.

enjoy doing so, and who produce high quality results.” The objective of team building is to establish and streamline internal procedures and policies while requiring the organization to work with fewer personnel. In addition, the organization must reduce the time consumed by specific processes while ensuring that customers are satisfied and the quality of work is sustained to established standards. “Effective teams,” Sanborn notes, “strive to improve their performance, increase cooperation and morale, improve interpersonal relationships, reduce adversarial interactions, and successfully complete their missions.”

The team concept at DOC is still in the formation stage of defining teams, coaches, and responsibilities. Separation, role clarification, unification, and, finally, maturation—the other stages in implementing the team-building process—will take place as team members get used to the new concept.

#### Formation

Formation is the briefest stage in implementing team building. During the formation stage, the coach (the team chief) leading the team-building effort needs to specify responsibilities and hold team members accountable for attending meetings and improving their productivity. It also is very important for the coach to encourage team members and facilitate a shift in their activities.

The primary purpose of the formation stage is to empower the coach so some responsibilities ordinarily held by first-line supervisors and technical support personnel can be assigned to team members. The coach, with the aid of various team members, should keep an activities log so that team members can track their progress. After a certain time has elapsed, the coach and team members will review the log to categorize their activities and, if necessary, shift some responsibilities to other team members. Some responsibilities that are commonly shifted include scheduling and, eventually, hiring of new personnel. Some duties and responsibilities often are shifted to other teams or team members in technical support positions, such as finance and accounting. Nonproductive or redundant activities are, with the consent of team members, eliminated altogether.

#### Separation

If an organization survives the formation stage, its teams then will venture into the separation stage. This is the most time-consuming, and perhaps the most difficult, stage in the entire process of team building. The separation stage—also known as the confusion stage—often mimics the early phase of human development known as separation anxiety, during which a child often feels lost and alone without a parent nearby to give direction and guidance.

With old beliefs challenged and new beliefs or techniques not fully in place or understood, there likely will be disputes among team members. There also may be added pressure on all parties because productivity may actually decrease in the separation stage.

Nonetheless, there is a positive side to the separation stage: Newly empowered work teams find they are becoming more willing to experiment with new techniques and tactics. These positive activities, coupled with the free flow of information, lead to team brainstorming sessions. These sessions can lead eventually to the emergence of a very cohesive, efficient team.

However, while this stage generally is positive, progress may still be an uphill battle for 12 to 18 months. During the separation stage, the coach needs to conduct comprehensive technical training and training in stress management and conflict resolution.

#### Role Clarification

In the role clarification stage, team members are fully aware of their duties and responsibilities. They realize that their job, basically, is to do everything. Even in such a late stage as clarification, problems can still arise. For example, team members usually tend to rely too heavily on one team leader. At this point, it is imperative that the coach implement an old formation-stage tactic: shifting responsibility from the team leader to the other team members.

In the clarification stage, problems are solved by means of multivoting, in which all team members listen to each other's workplace problems, identify potential causes, and then collectively arrive at a solution. Team members are infinitely more tolerant of the strengths



and weaknesses of each other at the role clarification stage than they were earlier.

Team performance surveys are distributed to team members by the coach during this stage. In these surveys, team members critique other coaches, teams, departments, and suppliers on a scale of 1 to 10, based on communication skills, productivity, innovation, professionalism, punctuality, and other factors. These critiques will determine where team members need training (creative thinking, problem solving, advanced technical training, cross-training, etc.).

### Unification

During the unification, or adolescent, stage, the team has developed into a cohesive, productive, intelligent, and very efficient unit. Incidentally, at this stage it is possible for a team to become too autonomous and seek to compete with other teams in the organization for leverage. Fortunately, teams have developed some sense of interdepartmental trust and mutual respect by the unification stage. The entire workplace culture has changed (or should have changed). Employees now expect, and often seek out, activities such as cross-training as new and greatly appreciated challenges.

The single greatest task for the coach at the unification stage is to maintain cohesion and trust by constantly integrating members from different teams. In order to integrate team members effectively, the coach must use methods such as shift overlap, cross-functional training, cross-functional problem solving, project groups, and special project days. Another highly effective method of integrating is to reward success on an overarching group basis: Instead of employee- or team-of-the-month awards, coaches should have a combined reward or incentive for all the teams. Instead of internal competition, teams will help each other with common goals, objectives, and activities.

### Maturation

The fifth and final stage of implementing the team concept is maturation. During this stage, open communication is encouraged and expected. Information, ranging from work and vacation schedules to performance evaluations, is freely and openly exchanged among all team members. Clearly, in the maturation stage, most activities are "team oriented" and rewards are based on the efforts of the "team." These efforts should include detailed planning of the entire working day.

A workplace at this stage of team building should be experiencing an average productivity increase of 30 to 40 percent and an overall increase in quality of 50 percent or greater. In order to continue improving in these areas, coaches should encourage team members to con-

tinue developing and nurturing deeper relationships with suppliers, distributors, and customers.

The coach also combats the possibility of stagnation among team members by sending them on temporary or special assignments, where they can work directly with suppliers, distributors, and customers. Ultimately, if the team proves successful, the coach should consider placing its members throughout the organization as seeds for future success.

### Survey Findings

In our survey of how teaming is working at DOC, we talked with employees, the union, and local management. Employees believe that the team concept has many advantages and few disadvantages at this point. Some of the advantages they see are—

- A more equal distribution of the work load.
- More backup people who have knowledge of projects, which helps in the event that one team member is unavailable.
- More timely completion of projects.
- Increased efficiency.
- Improved communication among workers on the same project.
- Cross-training for all team members.
- A more complete package presented to customers.
- A better quality contract (the DOC product).

AFGE Local 2324 is the local union for the DOC at Fort Riley. From a union perspective, there are no major concerns about the team concept. Though the teams can have a mixture of union and nonunion employees, all team members are represented equally by the union under law. The only difference between the union and nonunion members is that union members pay union dues and participate in union decision-making activities.

The Fort Riley director of contracting sees work teams as a natural match for other changes occurring within DOC. DOC has not received a specific legal requirement for teaming, other than Vice President Al Gore's National Performance Review. However, changes in the acquisition field, such as the Federal Acquisition Simplification Act and reorganization of job series, have prompted the director to implement work teams in DOC. For example, Government downsizing in recent years has resulted in many agencies, including the Fort Riley DOC, having to accomplish the same or more work with fewer people.

During an examination of work processes, the director found that different tasks have different peak periods of activity. For example, more small acquisitions (under \$100,000) were generated at the beginning of the fiscal year, while most contract administration work was done



at the end of the fiscal year. The director envisions using work teams to maintain continuity and even out work loads. By sharing information and work within and between teams, more workers are employed on tasks that must be performed immediately. By having the individuals who make a procurement also handle contract administration, the work load can be spread among a greater number of knowledgeable individuals.

In our survey, we found the following positives to team development—

- Local directors totally support building work teams.
- Work loads are leveled among team members.
- Contract administration is distributed among team members rather than assigned to one worker.
- A mentoring program is developed.
- The team concept contributes to, and possibly enhances, upward mobility within a job classification series.

We also found some negatives to team development—

- Research suggests that building cohesive and effective work teams requires 2 to 4 years. However, Government organizations rarely are allowed that much time to make measurable changes.

- Research also indicates that committed management is required to form work teams. The need to report measurable savings may interrupt the sustained commitment the team-building process needs over the long term.

- Current employees may not realize the degree of commitment they need to build effective work teams. Once they do, they may not be able or willing to give that level of commitment to the team.

- The Army and the Department of Defense (DOD) have developed software designed to modernize procurement and contract activities using electronic means. However, this software often is quickly outdated, and employees and contractors sometimes have trouble interfacing with it. Management at both the Army and DOD need to find solutions to software problems.

- Upper levels of management may decide to provide guidance where no guidance is needed and not provide guidance where it is needed. The commitment of local management to teaming may be undermined by other levels of management within the Army Forces Command, the Army, and DOD. Lack of current guidance also may indicate lack of understanding of how to build work teams. Higher levels of command either must give guidance that defines work teams or commit to a hands-off policy.

- Formation of work teams has been left to employees. Local management and employees must be guided to desired goals, if any goals are to be formulated. For example, will the work teams evolve into self-

directed teams, or will they remain strictly as work teams controlled by a higher level manager?

- Incentives for team formation and interaction are missing. The only rewards for team performance at this time are personal, varying with the individual team member. Financial and evaluation incentives are not in place. Group performance is neither evaluated nor rewarded.

Based on our survey, we were able to determine that most members in the DOC were very pleased with the team concept. On very few occasions did we hear disapproval. What we found particularly interesting was the general positive disposition of employees and how well informed they were about the implementation process. It was apparent that DOC management took the proper initial steps to establish communication and circulate updated information throughout the different departments. This provided the employees with an easy and fluid transition for successful teaming.

The DOC was able to outline a vision that was developed through the general consensus of the work force. The DOC management agreed with the mission statement, which was developed by allowing the employees to participate in defining their concept of the overall organizational vision and mission. The DOC leadership also demonstrated an eager desire to embrace the concept by creating a positive atmosphere. Under these favorable working conditions, the directorate was further able to develop team goals and objectives as well as engineer the ground rules that contribute to defining the organization's personality.

Team input and interface contributed greatly to forming and implementing the concept. One development growing out of teaming is the evolution of nontraditional work schedules, such as a compressed work week that allows employees the flexibility to adjust their work schedule during business hours. This flexible schedule is widely appreciated and has contributed greatly to improved employee morale and loyalty to the organization. So far, the team concept has been well received by employees and management.

**ALOG**

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*The author thanks Duffy Brown, Rene Caban, Jorge Padro, Don Peters, and Matt Stavros, all of whom collaborated in the preparation of this article as part of a group project in their master's degree program.*



# Radioactive Material and You

by Wayne Cook

Costly decontamination and serious health risks can be avoided by knowing and enforcing the standards for working with radioactive materials.

**D**o you know if the equipment you use every day on your job contains radioactive material? If it does, what does that mean to you? The fact is that *much* of our modern-day Army equipment, such as the sensors and telescopes on M1-series tanks and various howitzers and mortars, contains radioactive material.

Although our society has been concerned for some time with the radioactive contamination of the environment that results from using nuclear energy, the universe is permeated with radiation from other sources. Right now there are about a billion x-rays traveling through space for every elementary particle of matter. From the time man first appeared on Earth we have been receiving low doses of radiation from natural sources such as rocks, cosmic rays, air, food, and water. The amount of background radiation is not constant. In some parts of the world, background radiation levels are a lot higher than in others. Trace amounts of radiation also are inherent in commonplace items such as exit signs, smoke detectors, static eliminators, compasses, and watches.

## Protection From Radiation

Very soon after the discovery of x-rays in 1895, it became apparent that these new rays had both beneficial and harmful effects. But it was not until 1920 that the U.S. Government and scientists seriously began to contemplate setting up standards for protection against radiation injury.

During World War I, it was found that radium paint, which was a mixture of radium and phosphor, could be used to illuminate airplane instruments. Thus an industry was created in the eastern United States. After the war, radium painting switched to a civilian application—watch and clock dial painting. It is estimated that over four million watches with radium-painted dials were manufactured. It was customary for the young girls employed in this industry to form fine points on their paint brushes by shaping them between their lips before dabbing the radium paint on the watch dials. During this procedure, they ingested small amounts of radium. Between 1921 and 1924, nine radium workers died of severe, unexplained cancer that was accompanied by destructive lesions of the mouth and jawbones. The medical cause of death eventually was associated with radium.

Ultimately, all of the standards for radiation are derived from radiobiology data. In the earliest standards, these data were obtained chiefly from animal experiments. We now have obtained data from records of



medical treatments and radiation accidents, occupational worker histories, and profiles of survivors of the Japanese atomic bombings. Unfortunately though, much of the data were obtained on doses and dose rates well in excess of those encountered in the workplace. This means that some assumptions must be made in extrapolating these observable effects to the lower dose.

### How Safe is Safe?

Some recent studies suggest that low-level radiation appears to be beneficial to health. This is a very controversial area of study, and some say these reports have very little basis in fact. The actual degree of harm from exposure to low levels of radiation is unknown. Therefore, the Nuclear Regulatory Commission (NRC) and health physicists take a conservative approach of minimizing exposure to *any* radiation. Although the word "safe" commonly is used in referring to radiation exposure, it should be understood clearly that *no* amount of radiation can be considered 100 percent safe. "Biologically acceptable" is a more descriptive term for an amount that normally will not cause radiation injury.

### Know Your Responsibilities

As technology has advanced, radiation sources have been used more frequently. The Army has incorporated the use of radioactive materials in a variety of equipment. Even if exposure to radiation from Army equipment is minimal, it still must be considered seriously, and the equipment containing or generating radiation must be handled properly.

The NRC and the Army have standards for every aspect of radioactive equipment (storage, disposal, transportation, training, inventory, and reporting lost or damaged items). It is the responsibility of each individual who works with radioactive equipment to know these standards and what is required to maintain them. The NRC may inspect a facility at any time and assess fines. Ignorance of these standards is no excuse for violation of the NRC license.

It is important to know what items contain radioactive materials and to inventory those items. It is also important that all damaged or lost items be reported to the radiological protection officer (RPO) within 4 hours after the damage or loss occurs. The RPO will contact the license holder, who will contact the NRC. Remember that an incident that is reported is just that—an incident. However, an incident that is not reported is a violation of a Federal regulation and could result in civil or criminal penalties.

### Handling Damaged Radioactive Devices

1. Evacuate area.
2. Turn off central air system.
3. Open windows.
4. Restrict access to area.
5. Put on gloves, double-bag item or equipment in plastic bags, and mark bag "Broken Device—Do Not Open."
6. Dispose of gloves as radioactive waste and wash hands for 2 minutes.
7. Notify installation RPO immediately and stand by for further instructions.
8. Inform chain of command.

If you work with radioactive equipment, you must know exactly what license compliance means to you and your organization. The NRC requires everyone who works with radioactive material to receive training in radiation safety. This training will educate you on the responsibilities inherent in working with radioactive materials. You can avoid costly and time-consuming decontamination and serious health risks by knowing and understanding these responsibilities and the proper steps to take should an incident occur.

For additional information on radiation safeguards, call the Army Tank-automotive and Armaments Command Armament and Chemical Acquisition and Logistics Activity, Rock Island, Illinois, at DSN 793-6499. **ALOG**

*Wayne Cook is an instructor of M1 tank fire control and radiation safety at the Army Tank-automotive and Armaments Command Armament and Chemical Acquisition and Logistics Activity. He is a graduate of the DeVry Institute of Technology in Phoenix, Arizona, and attended the Basic Radiation Protection and H3 Illumination Devices, Chemical Equipment Maintenance, Radiation Safety, and Fire Control Computer Technician Courses.*



## Rethinking Ammunition Management

by Chief Warrant Officer (W-4) Leslie L. Rayburn

If we are serious about saving money in the Army, we must stop relying on the "the way we have always done it" and think with a vision of the future. To maintain an effective Army within the confines of an ever-constricting budget, we must reorganize and standardize training.

If we consolidated and reorganized training, we would be in a much better position to incorporate new doctrine and techniques. We could implement changes faster with less interference, and we could ensure that all related specialties receive the same quality of instruction.

I believe there are two ways the Army can save millions of training dollars: move rocket and missile training from Redstone Arsenal, Alabama, to other locations within the Army; and assign responsibility for training of ammunition military occupational specialties (MOS's) to the Quartermaster (QM) Corps.

Currently, the Army is training closely related MOS's at several locations. For example, we conduct turret training at three locations, and large and small missile training is conducted at two sites. These redundancies are a tremendous waste of money and invite negative scrutiny by outside agencies because much of the instruction is identical. The obvious solution would be to collocate training at one installation and establish common core instruction for both small and large missile training. At the completion of the common core subjects, the classes could be divided for specialty training.

We are stripping the need for technical ammunition training from the military by allowing the technical side of the ammunition field to be dominated by civilians in the quality assurance specialist (ammunition surveillance) (QASAS) career field. At many locations, MOS 55B soldiers (ammunition specialists) are fuel handlers first, rock painters second, and ammunition handlers third. Often 55B personnel do not perform vehicle inspections, which is a basic 55B function. Our 55B soldiers do not get enough training to be able to inspect vehicles in war because the inspections are being performed by QASAS personnel during peacetime. Although this ensures our QASAS civilians of long-term employment, it fails to prepare our soldiers for combat. The adage, "you fight as you train," is as valid now as ever. This unabated civilianization of the technical aspect of the ammunition field

relegates our 55B's to a labor force, forces our warrant and commissioned officers into a logistics management role that mirrors other QM logistics roles, and vastly reduces the requirement for "schoolhouse" training of ammunition specialists.

Current doctrine places modular ammunition platoons under the command of nonammunition units in the event of deployment to a hostile environment. Ammunition platoons deploy with the support organization that deploys first. This is not likely to be an ammunition unit but instead a corps support battalion commanded by a QM officer. When approached as a commodity, the management of ammunition parallels a quartermaster much more than an ordnance function. An analysis of the curricula in the Warrant Officer Basic and Advanced Courses for soldiers with an MOS in the 91 series (Ordnance) shows a close resemblance to the training given soldiers with an MOS in the 92 series (Quartermaster).

My proposal is this—

- Move all large rocket and missile training to the Air Defense Artillery Center and School at Fort Bliss, Texas. This would consolidate and integrate operator and maintenance training and eliminate redundant training at Redstone Arsenal. Currently, both the Ordnance Missile and Munitions Center and School (OMMCS) at Redstone Arsenal and the Air Defense Artillery School teach startup procedures to all maintainers. Combining this training with operator training at Fort Bliss would eliminate this redundancy. Although there are several levels of training, they are similar enough in content that the same cadre that teaches one level could teach other levels easily. Consolidating this training would eliminate the requirement for maintaining dual classrooms and training aids. It also would lessen the need for Patriot missile training tactical sets, the cost of which alone would justify consolidation.

- Move small missile training to the Armor Center and School at Fort Knox, Kentucky. This would consolidate training, align combat development functions, and reduce redundancy. Combining missile training also would reduce classroom and instructor costs greatly.

- Move all turret training to either Aberdeen Proving Ground (APG), Maryland, or Fort Knox. This would consolidate training from three locations—Fort Knox,



APG, and Redstone Arsenal. The resulting elimination of multiple sets of training aids would generate huge savings.

- Move ammunition management from the Ordnance Corps to the QM Corps as another class of supply for QM soldiers to manage. To keep their identity as ammunition specialists, assign ammunition personnel a QM additional skill identifier. Ammunition specialists lost their uniqueness when they lost responsibility for handling nuclear weapons. The Army is no longer in the ammunition manufacturing business. Our technical skills lie in managing the movement, storage, and shipment of ammunition. Ammunition is no harder to store than class III (petroleum, oils, and lubricants). Ammunition folks are commodity managers, so they should be put into the commodity management arena. Ammunition training, which consists mainly of forklift driver training, does not require large ammunition storage points. This training could be conducted in warehouses without using live ammunition rather than in bunkers. Entry-level ammunition personnel (55B10's) are under the constant supervision of either their crew chief or squad leader. (The designation 55B10 means an MOS of 55B, pay grade E1 through E4, ordinary [or general]).

Changes underway in materials-handling equipment requirements will reduce drastically the number of 55B soldiers needed. The numbers will diminish even more with the fielding of the container roll-in/roll-out platform (CROP). In a letter dated 16 March 1996, the Chief of the Army Training and Doctrine Command Munitions System Manager Office, Redstone Arsenal, stated, "The use of the CROP would enable throughput of ammunition loads with little or no interruption." If there is little or no interruption, there is little or no need for ammunition handlers.

Radio frequency tags also have reduced the requirement for 55B's. If we load the CROP's and ship them directly from depots in the continental United States, we do not need a large 55B infrastructure. We will be able to track the ammunition on the battlefield with radio frequency tags, which will improve ammunition management.

The headlong rush to replace soldiers with handling equipment such as the CROP and the palletized loading system and the continued decrease in responsibilities of ammunition personnel reduce the number of munitions handlers needed. Moving ammunition in either combat configured loads or strategic configured loads would negate the need for large corps storage areas, theater support areas, and ammunition storage points. One real need that will continue to occur in the ammunition arena will be cleaning up a battlefield after a conflict. However, that task could be performed better by QASAS personnel or contracted support than by 55B soldiers.

The savings resulting from consolidating munitions training would free us to use our training dollars more effectively. It would allow the Ordnance Corps to concentrate on maintenance and put ammunition into the commodity management field where it would be treated for what it is—a commodity.

We need to change, evolve, and move into the future with new vision, a new mindset, and new determination. We must not let technology drive doctrine. Rather, we must ensure that doctrine drives technology.

*Chief Warrant Officer (W-4) Leslie L. Rayburn is assigned to the 17th Ordnance Company in Korea. He is a graduate of the Officer Candidate School, Infantry Officer Advanced Course, Special Forces Qualification Course, Ammunition Initial Entry and Advanced Courses, and Fixed Wing Aviator and Rotary Wing Qualification Courses.*

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## The Case for Distributed Logistics via TCP/IP

by Master Sergeant Bob Dalton, USA (Ret.)

In the last few years, transmission control protocol/Internet protocol (TCP/IP) has come to dominate the Internet world as the protocol of choice for online applications. The widespread acceptance of this robust

and stable protocol has made the explosive growth of the Internet possible. TCP/IP also has opened up new avenues for disseminating information to logisticians and put the creation of an online, distributed military logistics



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by Master Sergeant Bob Dalton, USA (Ret.)

In the last few years, transmission control protocol/Internet protocol (TCP/IP) has come to dominate the Internet world as the protocol of choice for online applications. The widespread acceptance of this robust

and stable protocol has made the explosive growth of the Internet possible. TCP/IP also has opened up new avenues for disseminating information to logisticians and put the creation of an online, distributed military logistics



system well within the Army's reach. However, when we consider how to establish a distributed logistics system, we must weigh the greatest strength of the Internet—its vast capability for transporting data worldwide—against its greatest weakness for military application—public access.

### Benefits of Distributed Logistics

When we use the term "distributed," we are speaking about the capability of remote users to access centralized computer server systems via Internet "clients," and to do so as easily and efficiently as if they were local users housed in the same building with the central systems. Distributed logistics allows us to minimize the computer hardware required at remote locations while maximizing logistics centralization and speed of operations. By using a distributed logistics system, we can reduce tremendously, if not entirely, the redundant manual input of data at logistics support activities (LSA's). Other cost savings would result from reducing the use and transport of printed materials.

Here is just a small sampling of logistics areas that could be affected positively by using distributed logistics computing—

*Submitting requisitions.* Remote users could enter requisitions directly into the LSA computer system. No human intermediary would be needed to input data, as is often the case now, especially in the reserve components. The immediate benefits would be a reduced need for staffing to input data and the elimination, to a significant degree, of manual processing of requisition forms. Allowing users to submit requisitions over the Internet for general supplies, repair parts, clothing, and many other supply commodities would greatly enhance the logistics system's speed in responding to customer demands.

*Maintaining property books.* Property books would be maintained at the LSA instead of locally. This would allow transactions to be posted in real time and might make it possible to eliminate property book computer systems at the local level.

*Reporting logistics and maintenance readiness.* Transaction reporting could be performed in real time—in other words, as changes occur—instead of monthly or quarterly, as is the case now. Centralizing readiness reports at the LSA would allow those reports to be provided to higher headquarters on demand.

*Distributing logistics and maintenance documents.*

Instead of producing, publishing, and shipping CD-ROM's, microfiches, or hard copies of maintenance and logistics manuals, we would access them directly on the Internet. The possible benefits of this change alone are immense. Online documentation would lead to the maintenance of truly "living" documents that change in real time, which is something we in the logistics community have been seeking for a long time. The proponent of the manual would maintain one online copy of the document, which the whole force structure would access through the Internet. The proponent would be able to make needed changes in this document instantly, and the revised version of the document would be available to users immediately. Not having to produce, publish, and ship CD-ROM's or printed materials would by itself produce huge cost savings. It also would be more environmentally friendly, because it would reduce the need to dispose of paper, plastic, and other materials.

*Leveraging legacy hardware.* The budgetary facts of life dictate that upgrading and replacing field logistics computing systems will seldom keep pace with rapid changes in technology. Distributed logistics computing allows older computer systems to harness and benefit from the power of larger and newer centralized systems and software that might be beyond the capabilities of local client computers. If you have used the Internet, you already are seeing and benefiting from this, perhaps without realizing it.

### Internet = Client/Server

Until fairly recently, accessing information over the Internet via TCP/IP meant using a hypertext markup language (HTML) web page that you accessed through a common gateway interface (CGI) or Internet server application programming interface (ISAPI) data base application. While functional and useful in the civilian world, these information access mechanisms leave much to be desired when it comes to the military's requirements for data access security. This problem has slowed or halted implementation of distributed logistics in the military.

For distributed logistics to become acceptable to the military logistics community, we must find ways of ensuring that supply and logistics data are not accessible by the civilian world on the Internet. We also need ways of limiting access to those individuals who are required and authorized to work with the data.

At present, the requirements of the Defense logistics system for controlled data access and security can be



met using client/server application software. For those not already familiar with this concept, a client application is what a remote computer uses to connect and work with a central server application. The server application does not initiate connections but only responds to the client's requests and queries. A good example of this would be almost any Internet browser. The browser is the client and the web server is the server.

In the client/server software model, we design and build custom software client and server TCP/IP applications. These applications take advantage of the data transport strengths of the Internet and ensure that unauthorized persons cannot see what they are not authorized to see.

Until fairly recently, the only drawback to standard client/server applications was the fact that the user had to know what port the server application was using before he could "connect" the client to it. There was no built-in way for knowing what servers were available at the LSA for plugging in the client. One possible solution was recently released with little fanfare by Microsoft. Called the DirectPlay API, it provides both visibility of all Windows-based servers running under DirectPlay on a computer and allows a remote user to connect with them seamlessly via a number of protocol mechanisms (dial up, TCP/IP, etc.) running on his remote Windows system.

### Back to the Future (Again)

While I advocate the concept of distributed logistics, I do so with a real sense of amused irony and *deja vu*. In the 1960's and 70's, logistics was moving toward centralization because of the introduction and use of large, expensive mainframe computers. However, in the 1980's and early 90's, as much cheaper and more powerful desktop computers proliferated, the logistics automation community made a U-turn and started to head in the opposite direction, toward decentralization. Now it's the late 1990's, and, thanks to the Internet, we appear to be once again reversing direction and placing ourselves firmly on the road to logistics centralization in the next millennium.

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**ALOG****SYSTEMS**

*The information presented in Army Logistician's ALOG Systems is compiled, coordinated, and produced by the Army Combined Arms Support Command (CASCOT), Information Systems Directorate (ISD). Readers may direct questions, comments, or information requests to Lieutenant Colonel Thet-Shay Nyunt by e-mail at [nyuntt@lee-dns1.army.mil](mailto:nyuntt@lee-dns1.army.mil) or phone (804) 734-1207 or DSN 687-1207.*

*-Editor*

## GCSS-ARMY—MORE THAN A NAME CHANGE

When the Integrated Combat Service Support System (ICSS) was renamed the Global Combat Support System-Army (GCSS-Army) last December, personnel with access to the World Wide Web (WWW) and Army Listservs knew immediately. Unfortunately, disseminated information does not travel at the same speed to all parties. The simple posting of information in Army publications often requires over 30 days of lead time. The same information on the WWW or e-mail can be accessed in seconds. This inequality of access to information is one reason the Army must develop the next generation of logistics systems. GCSS-Army will help to bridge the Army to the "Information Age."

Eventually, GCSS-Army will replace or interface with all of the Army's existing combat service support (CSS) automated systems. Although its title specifies CSS rather than logistics systems, the new system will encompass personnel, financial, medical, and other CSS functions.

The GCSS-Army renaming will not impact system requirements or capabilities. However, the new name will help people understand that GCSS-Army is a component of the overarching joint system of the same name. The proponent for development of GCSS-Army is the Army Deputy Chief of Staff for Logistics; requirements will be determined by the Information Systems Directorate, CASCOT; and the materiel developer is the Project Manager, Integrated Logistics Systems (PM ILOGS).

## ARMY RESERVE RETAIL SUPPLY INITIATIVE PICKS UP STEAM

The Army Reserve has implemented a retail supply initiative that involves the peacetime employment of modification table of organization and equipment (MTOE)-authorized Standard Army Retail Supply System (SARSS) equipment and the use of MTOE direct-support and general-support supply and maintenance organizations and Army Reserve materiel management centers to perform daily operations. The concept regionalizes retail supply operations for the entire Army Reserve Command from three locations. Currently, the 377th Theater Army Area Command (TAACOM), New Orleans, Louisiana, processes all requisitions for Southwest Asia (Saudi Arabia and Kuwait). The Army Reserve is currently processing all National Training Center requisitions through its west coast supply hub operated by the 311th Corps Support Command, Los Angeles, California. The 310th TAACOM, Fort Belvoir, Virginia, will soon be online and is prepared to support all Reserve elements on the east coast. By fiscal year 1999, the Army Reserve should have the capability to provide retail supply support to both on- and off-post non-Army Reserve customers. This reengineering initiative will result in significant savings to the total Army by leveraging both MTOE equipment and organizations to support peacetime logistics support requirements. This initiative also will provide invaluable "train-as-you-fight" experience for combat support and combat service support elements of the Army Reserve.

## GCSS-ARMY OPENS GOOD IDEAS WEBSITE

The Army Deputy Chief of Staff for Logistics and the PM ILOGS at Fort Lee, Virginia, have developed a Global Combat Support System-Army (GCSS-Army) "good ideas" website. The purpose of the website is to solicit ideas from the field on GCSS-Army Tier I and facilitate a dialog for improving logistics automation. Phase I fielding of GCSS-Army is scheduled to begin in the 4th quarter of fiscal year 1999.

Ideas identified as valid requirements will be prioritized for inclusion in the GCSS-Army. The GCSS-Army good ideas website can be accessed from the PM ILOGS home page (<http://ilogs.army.mil>).

## UNHERALDED CSS SYSTEMS INITIATIVES IMPACT ARMY OPERATIONS

Combat service support (CSS) systems such as the Unit Level Logistics System-Ground (ULLS-G) and the Standard Army Retail Supply System (SARSS) are integral parts of Army units. In addition to these



major systems, there are a number of lesser-known systems already in the field or in development that affect logistics support—

- Automatic identification technology (AIT) is a category of systems that can query vehicles and containers electronically, whether stationary or in-transit, to provide system users with information on locations and cargoes. A key component of AIT is the radio frequency (RF) tag and a query device called an interrogator. This transmitter and receiver, linked together by satellite or other means of data communication, takes the mystery out of locating a shipment or truck. The RF tag is the electronic equivalent of a bar code label that is placed on a container, pallet, or vehicle at the start point of a journey. Interrogators can be placed at any point along a route or at points where modes of transport are changed. The interrogator, in combination with a computer data base, hardware controller, and two-way communication, allows system users to pinpoint the location of specific shipments or vehicles as they pass strategically placed interrogators. RF technology is in place at selected continental United States and European locations in support of Advanced Warfighting Experiments and Operation Joint Guard.

- The Automated Manifest System (AMS) is a Defense Logistics Agency (DLA) initiative that uses laser-readable optical cards instead of paper packing slips on the exterior of shipment containers. The card carries a detailed list of the contents of the multipack, including transportation control numbers (TCN), national stock numbers, and document numbers. The AMS is used at depots, central receiving points (CRP's), and supply support activities (SSA's) such as the direct support unit in a forward support battalion of a division to facilitate manifesting and tracking of shipments from the depot to the CRP or SSA. AMS provides "in-the-box" asset visibility and may be used as the source of intransit visibility data. The AMS reader can be connected directly to the Standard Army Information Management Systems (STAMIS) at the receiving unit, thereby increasing the accuracy of data by automating the input of source data. This system has been used in Somalia and Haiti and is currently in use in Bosnia.

- Interactive electronic technical manuals (IETM's) will supplement and eventually replace hard-copy technical manuals with documents in electronic form. IETM's are software-driven diagnostic aids that incorporate expert systems to lead a repairman through complex troubleshooting and repair of Army systems. Embedded multimedia, audio, animation, and video guide technicians through difficult operations and maintenance procedures. IETM's can be linked to equipment diagnostics to provide faster troubleshooting and expert information to the entire organization. This system will

improve maintenance productivity, reduce training costs, streamline technical manual updates, and allow units to take multiple IETM's into the field. CASCOM is providing functional user and concept support to Logistics Integration Agency (LIA) efforts to digitize Army TM's. The goal is to provide more accurate and timely access to technical information through ETM's and publish an Army IETM strategic plan that will identify benefits of IETM's and select legacy weapon systems that will migrate to IETM use. Legacy system ETM's interface with STAMIS. The M1 Abrams tank, M2/3 Bradley fighting vehicles, AH-64 Apache helicopter, multiple-launch rocket system, and Patriot missile are some of the high-profile, high-operational-cost systems for which IETM's are being developed.

Currently, there are three phases in the ETM/IETM effort. In Phase I, the LIA is digitizing technical manuals (TM's) that support the 4th Infantry Division (Mechanized), 3d Infantry Division (Mechanized), and their respective corps traces and will issue the digitized TM's as ETM's on CD-ROM. Phase II will capitalize on lessons learned in Phase I and complete digitization and fielding of ETM's Army-wide. Phase III will incorporate development of IETM's for classes III, IV, and V, targeting weapon systems with high maintenance costs and high impact on readiness. It integrates IETM requirements across multiple weapon systems to include development of "families" of common IETM's (such as internal combustion engines), continued testing and evaluation of off-the-shelf technologies, and validation of benefits. The end state will be IETM's that are artificially intelligent diagnostic and prognostic tools that provide accurate predictive capability for the battlefield repairman and eliminate errors in diagnosis.

- The contact test set (CTS) AN/PSM-80 (V) is a component of the integrated family of test equipment. This ruggedized system is a man-portable, knowledge-based test set that is used at all levels of maintenance to diagnose faults at the line replaceable unit (LRU) level. It will be used to augment built-in test equipment in weapon systems, act as the Army standard platform for electronic technical manuals, and eventually may serve as the Army standard software downloader. The CTS is a modular tester and electronic information delivery device that can be reconfigured to meet the maintenance support requirements of different commodities and items at the unit level and above.

- The soldier's portable on-system repair tool (SPORT) will be the next generation follow-on to the contact test set. It will consist of a controller/diagnostic aid and an instrumentation expansion chassis.

For more information on current and emerging CSS systems, visit the ISD web site at <http://www.cascom.army.mil/automation>.