

Quartermaster

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A black and white photograph of a soldier in full combat gear, including a helmet and camouflage uniform. The soldier is standing next to the open rear hatch of a military vehicle, possibly a truck or jeep. He is holding a fuel hose that runs from the vehicle to the ground. The background shows a wooded area with trees. The overall tone of the image is serious and professional.

**PETROLEUM - FORWARD -
Lifeblood of the Battlefield**



U.S. ARMY QUARTERMASTER CORPS



Key To Logistics

THE QUARTERMASTER GENERAL

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1989 — THE YEAR OF THE NCO

MG William T. McLean

In selecting the Noncommissioned Officer (NCO) as the Army theme for 1989, the Army is highlighting their special role and the dedication to the force so often demonstrated throughout history. The Non-Commissioned Officer is the principal point, the pivotal interface through which the entire Army effort is transmitted to the individual soldier.

Starting with the individual recruiter in the hometown of America, it is the NCO who introduces the Army to our nation's young men and women. It is the NCO who provides the sustaining base of new soldiers through training and education. It is the NCO who provides for the daily continuity of operations, who cares for soldiers and their families. The NCO passes on the history and traditions of the Army, and ultimately, through their example, perpetuates the existence of the Army by developing their own replacements.

The following is a portion of the text of a joint announcement of the Army theme for 1989 by the Secretary of the Army, John O. Marsh, Jr, General Carl E. Vuono, Chief of Staff, Army, and Julius W. Gates, Sergeant Major of the Army:

"Soldiers who wear NCO's chevrons on their sleeves represent a unique Army strength upon which this year's theme will focus. The previous yearly themes of spirit of victory, physical fitness, excellence, families, leadership, values, the constitution, and training all have a special bearing on NCOs, who have key responsibilities in accomplishing the Army's missions.

Throughout the history of our Army, the NCO has played an indispensable role in the warfighting readiness of our force.

Baron Von Steuben, in writing our first Army manual, known as the "Blue Book", acknowledged the importance of selecting the right soldiers as NCOs: "The order and discipline of a regiment depends so much upon their behavior, that too much care cannot be taken in preferring none to that trust but those who by their merit and good conduct are entitled to it. Today, we continue to expect of our NCOs the highest professional standards and a diversity of knowledge in order to lead their soldiers in ensuring our Army is trained and ready. Tomorrow we shall expect no less."

Unique challenges face the Quartermaster NCO, for while meeting every requirement of any other soldier in the Army to lead, train and maintain unit and individual combat readiness, they must at the same

time continuously execute their daily mission. To do this, Quartermaster NCOs must possess a wide range of military knowledge and expertise.

Recent Army personnel actions highlight the need for our NCOs to be tactically and technically proficient in all aspects of their military career. As an example of the critical nature of this need, in 1985 the Army abolished the Specialist ranks above E-4. Until then, Quartermaster soldiers who were in those technical specialties were separated by the Army from normal NCO duties. Now, these technicians must still remain proficient in state-of-the-art technology, and also be leaders. Compounding the challenge is the Army's decision to reduce the Warrant Officer inventory in the logistics field. Skills previously the bailiwick of warrant officers now must be mastered by our NCOs. Additionally, Commissioned Officer reductions taking place throughout the Army are resulting in many positions being converted to NCO slots. The sum of these actions places more responsibility squarely on the shoulders of our Quartermaster Noncommissioned Officers. I have complete confidence in our NCOs as they meet the call of these actions and continue to prepare our soldiers to perform their missions in peace and war.

Improved training methods, military leadership training, physical fitness programs, and emphasizing basic educational skills will all assist today's NCO in rallying to these unique challenges. Quartermaster resident training is ensuring that a sufficient supply of technically trained personnel are available for Quartermaster career field development. This is being accomplished while tailoring the resident training courses to individual professional development patterns.

The linking of promotions to the Noncommissioned Officer Education System (NCOES) is increasing the education level of the NCO and enhancing our NCO's ability to learn, teach, train, mentor, solve problems, act independently and motivate others. Within the framework of NCOES, our relatively new Quartermaster NCO Academy is developing our NCOs as trainers and leaders.

As the Quartermaster General, I am proud of those Quartermaster Noncommissioned Officers who have served in the past and proud of Quartermaster NCOs with whom I am currently serving. I salute you!

***MG William T. McLean is the
Quartermaster General.***

PETROLEUM DISTRIBUTION CORPS FORWARD

COL RICHARD P. DACEY

The series of articles featured in this issue of the Quartermaster Professional Bulletin dealing with bulk petroleum at the corps level and below are intended to provide both a historic perspective and insight into current issues facing the liquid logistician. They offer a look "over the shoulder" from the Forward Line of Troops (FLOT), through the division and into the corps at the past, present and emerging systems used to accomplish the critical mission of bulk fuel resupply.

The articles addressing "Refuel on the Move", HTARS and the Mobile POL Laboratory focus on systems designed to meet the ever increasing need to refuel rapidly, in large quantities. They also point out another trend: that of adapting existing equipment to changing requirements instead of delaying the satisfaction of those requirements while waiting for new equipment to be fielded. The QM POL specialist's efforts are constantly aimed at enhancing the mobility and survivability of refueling systems. Concurrently, those efforts maximize their effectiveness in meeting the needs of the force's maneuver elements.

"High Octane Support", the 260th POL Battalion provides a glance at the many and varied activities of a truly multi-functional battalion. Liquid logisticians should take note that depending on the level of conflict and the size of the force to be supported, battalion commanders may well be responsible for far more than "just" bulk Class III. We all need to expand our professional base of expertise to become technically competent in the supply of all commodities. Moreover, we all need to be capable leaders in the areas of physical distribution and maintenance.

"Red Ball Express to the Rescue" provides a historical perspective, focusing on the "frantic resupply" of gasoline to the European Front in 1944. Packaging bulk fuels remains a viable, if tertiary means of resupply. Such extreme alteration of our normal doctrinal distribution would require extensive planning for packaging (5 gallon cans, 55 gallon drums, etc.). It would also mean the use of non-standard POL transportation (cargo trucks, vice tankers) and the associated delays in the transportation of other commodities of supply.

The huge resupply quantities referred to in that article are dwarfed by today's requirements. By comparison, the requirements of a corps in World War II were the same as those of a division in 1989. Today, fuel hungry, highly mobile, rapidly deployable, ground and air forces as well as mobile electric power plants tax the ability of the liquid logistician in the field; providing sufficient

quantities of fuel at the right place and time has never been more of a challenge.

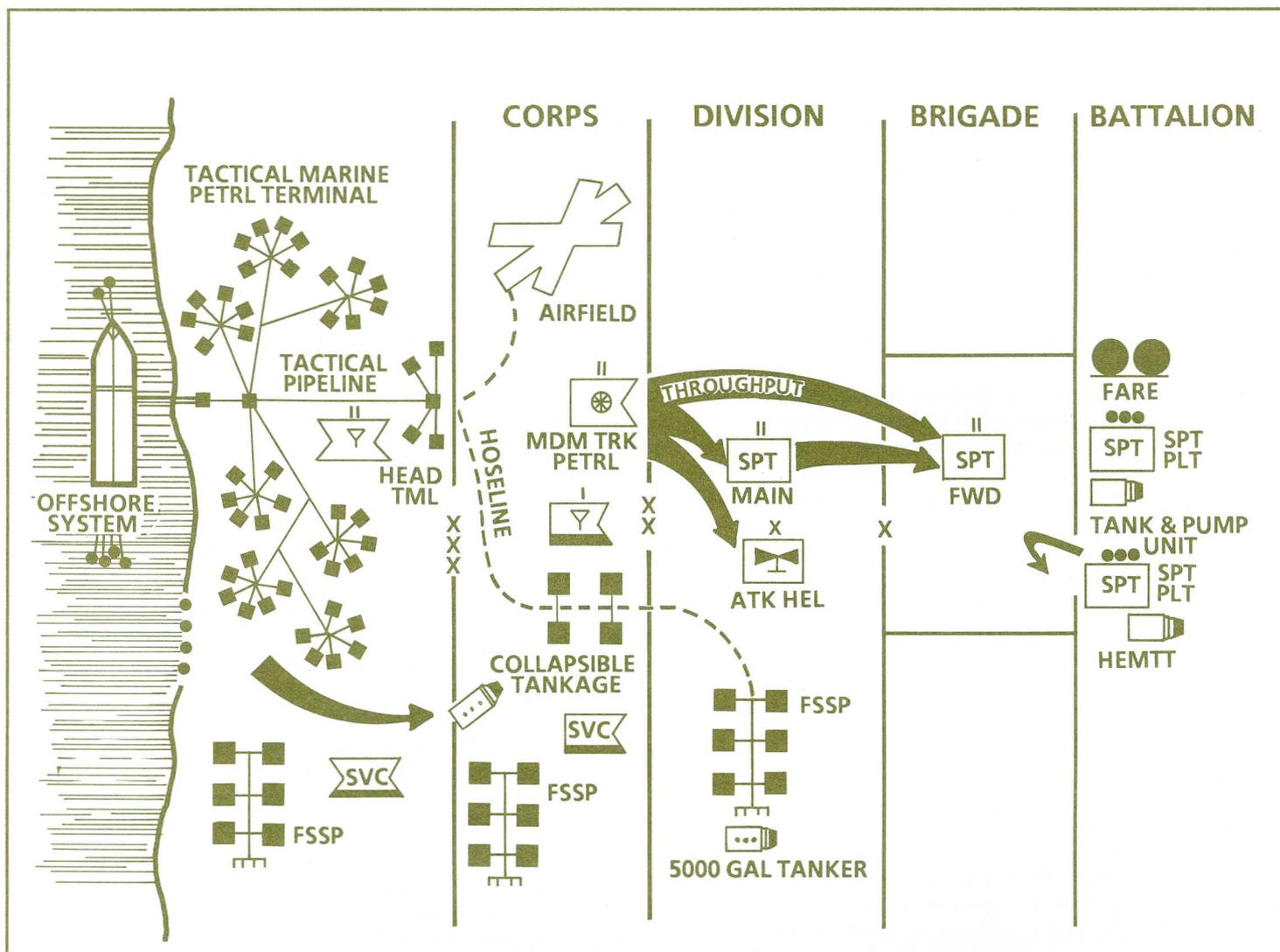
It is also interesting to note that the World War II mobility fuel requirements were exclusively for gasoline (color coded red to denote the presence of tetraethyl lead). We have been working for over twenty years to get back to a single fuel on the battlefield in order to simplify the burden on the logistics system. The initiative to replace both diesel fuel and JP4 with JP8 will move us a quantum leap towards that goal. It will also place an increasing burden on fuel handlers and laboratory technicians to ensure the quality of fuel throughout the system. Simply stated, in this issue of the Quartermaster Professional Bulletin, we are trying to emphasize the importance of liquid logistics in the dirt, and the importance of keeping the dirt out of liquid logistics.

Other developments deserve mention. The Vice Chief of Staff Army and the TRADOC commander have been briefed on the movement of bulk fuel into the Main Support Battalion from corps storage by assault hoseline. This would increase thru-put capabilities and reduce truck traffic. We have received approval to pursue this concept and are looking at new materiel with much greater storage/use life and less weight as a replacement for existing hoseline.

Those pipelines are made of composite materials. They would be less expensive, more easily installed and recovered, and require lower costs for storage. We are also looking at applications of the palletized loading system for both bulk and packaged fuels. This system would add another tool to the inventory of capabilities of the liquid logistician.

Without exception, the lessons we are learning and the methods we are employing for bulk class III supply have corrolaries in that of fresh water. Our water storage and distribution systems are based on configurations developed for fuel. Our choice of the term "liquid Logistics" is an overt attempt to remind all petroleum handlers that potable water storage and distribution is also part of our mission.

There are no sacred cows. In a period of reduced resources, increasing requirements and changing priorities, two things remain constant: a gallon of fuel weighs 7.3 pounds and 60% of resupply tonnage for the force will be bulk class III. Mission failure is not an option. We need to input our ideas and experience to improve and enhance our support capabilities. If we provide 100% support to the combat arms, we are doing, simply, what we are paid to do.



Today's modern military forces consume large amounts of petroleum products in support of combat operations. Special channels of responsibility have been established to ensure an uninterrupted supply of that critical commodity.

On the staff of the united commander, the **Joint Petroleum Office (JPO)** provides staff management of petroleum at the Theater level. The **Theater Army materiel management center (TAMMC)** is the theater petroleum manager for both bulk and packaged petroleum products. It also collects long range petroleum requirements for the theater. (The Summer 1989 issue of the Quartermaster Professional Bulletin will highlight Echelons above Corps

Petroleum, to include an article from the 200 TAMMC, Zweibrucken, FRG.)

The principal organization carrying out the bulk fuels distribution mission in the Communications Zone (COMMZ) is the **Petroleum Group**. It is responsible for the detailed Class III distribution planning that forms the basis for design, construction, and operation of the Theater level distribution system. Under it, the petroleum pipeline and terminal operating battalion operates and maintains petroleum distribution facilities required to support and maintain a portion of the theater. Petroleum pipeline and terminal operating companies within this battalion operate about 150

kilometers of military multiproduct pipeline. These companies are also responsible for the storage and distribution of bulk fuels.

The **Petroleum Supply Battalion** provides GS and DS petroleum support in the Corps and TAACOM. The **Petroleum Supply companies** in this battalion receive, store, and transfer bulk petroleum to divisional and non-divisional **Direct Support Supply and Service Companies**. The **Supply and Service** companies establish operating areas for the receipt, storage, and issue of supplies to the organizations that consume the fuel.

In supporting the user, **Petroleum Supply Platoons** request fuel from the **Division Material**

Management Center (MMC). They in turn pass the request to the Corps Support Command (COSCOM) MMC. The COSCOM MMC goes to the **COSCOM Petroleum Supply Battalion** to make the issue. Then, the battalion tasks one of its transportation medium truck companies to go to a designated petroleum supply company, pick up fuel, and deliver it to the required supply point. Each day the Petroleum Supply battalion tells the COSCOM MMC how much it needs to fill up its storage capability. The COSCOM MMC goes to the TAMMC. The TAMMC receives requirements from the petroleum group and forwards requirements to the JPO. The JPO consolidates the requirements for all the services, and forwards them to the **Defense Fuel Supply Center (DFSC)**. The DFSC procures the fuel and ships it back to the theater of operations.

Within the Division there are four battalions and a brigade that receive, temporarily store, issue, and distribute Class III bulk fuel supplies. These are the **Combat Aviation Brigade (CAB)**, **Main Support Battalion (MSB)**, and the three **Forward Support Battalions (FSBs)** (located in the Brigade Support Areas [BSAs]). The petroleum storage and issue section, Supply and Service (S&S) Company, MSB, operates the Class III distribution points in the Division Support Area (DSA). The petroleum section of the FSB supply company operates the Class III distribution points in the BSA. Additionally, bulk aviation fuel distribution points are located in and operated by the CAB.

REQUISITIONING

The supply of bulk fuel is based on forecasts of requirements developed at the using unit (company and battalion) level. They are reviewed and consolidated at the

brigade level and forwarded to the Division Materiel Management Center (DMMC). The DMMC forwards a consolidated report to the COSCOM MMC. In order to ensure adequate reaction time and availability of fuel, forecasts should cover the 72-hour period beyond the next day. For example, the forecast sent to the DMMC on the seventh day should be the projected requirements for the ninth, tenth, and eleventh days.

DISTRIBUTION

The division is routinely resupplied with bulk fuel by the COSCOM, utilizing 5,000-gallon tank trucks or railcars, pipelines and hoses if available. Bulk fuel is normally delivered to the division main fuel distribution point located in the DSA. This distribution point is operated by the S&S company of the MSB. Fuel is stored in collapsible storage tanks or transferred to the MSB's, 5,000-gallon fuel-servicing trucks. These MSB tank trucks make distribution to the forward fuel distribution points operated by the FSBs positioned in the BSAs.

Tactical units pick up fuel in the BSA with organic tank trucks and deliver directly to the combat vehicles. Depending upon the terrain and tactical situation, the unit tank trucks may refuel weapon systems in their combat positions, or the systems may be moved to defilade. Whenever possible, COSCOM will deliver bulk fuel as far forward as a forward fuel distribution section in a BSA. The COSCOM will resupply aviation fuel storage facilities operated by the CAB. The organic tank trucks of the CAB are used for **Class IIIA** supply of their respective units. These tank trucks are capable of storing two days of supply of Class IIIA for the brigade. Aircraft will refuel at either a forward arming

and refueling point operated by aviation units or at designated assembly areas behind the brigade rear boundary.

The MSB provides support for the supply of all Class IIIA requirements either by attaching trucks direct to the organizations having aircraft or by allocating tank trucks direct to the Class III distribution points supporting these organizations. The MSB is required to maintain one day supply of Class IIIA. This is accomplished by using the storage capacity of these attached or allocated vehicles.

Collapsible drums may be delivered direct to the using units and fuel dispensed direct to aircraft at a refueling point and to vehicle tanks and 5-gallon containers wherever a refueling system may be located.

RESERVES

The division maintains a reserve of Class III supply in the DSA and replenishes the loads of its tank trucks as rapidly as they are exhausted. The minimum desirable amount of bulk petroleum to be held in the corps area is: 1 day of supply for Direct Support, 4 days of supply for General Support. In the Division area, 1 day of supply; and in the Brigade area 2 days of supply in reserve are required.

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REFUEL ON THE MOVE (ROM)

CPT. GERARD T. COTTER

Since their appearance in the Army inventory, the Quartermaster Petroleum (POL) Officer has always been faced with the task of providing fuel for combat vehicles. When called upon, they put together a system of hoses, valves and nozzles, hook them to a tanker, then signal that they're ready to pump fuel. In the past, this action was not recorded as a monumental event. That was then, this is now - those vehicles didn't drink gas at the rates that our newer ones do.

With the introduction of the M-1 main battle tank and other gas guzzling weapon systems, refueling has taken on a heightened importance. Tacticians looked to logisticians to provide fuel faster, and in greater quantities than ever before when the M-1 proceeded forward at 3 to 5 gallons per mile. The Petroleum Liquid Logistician responded to this need with Refuel On The Move (ROM).

When the POL platoons layed out a refuel point using ROM, the tacticians noticed and soon, the idea caught on. Using the ROM concept, 5000-gallon tankers became mobile fuel sources. The tanker's onboard pump and separator, or an external pump separator was used, hooked up to POL hoses, valves and nozzles each tanker formed a ROM point with six to twelve refuel outlets. If enough equipment and space was available an entire convoy march unit could be refueled at the same time.

Support units use ROM to refuel unit vehicles, allowing those organizational refuelers to stay topped off. Issue of fuel at ROM points was determined by calculations based on the requirements of the greatest fuel consuming vehicle. A unit moves into a ROM point, receives fuel for the amount of time dictated by that calculation, and then leave, as a unit. ROM

provides a method for refueling several vehicles at one time. It also increases a unit's combat effectiveness by allowing their refuelers to stay topped off as the unit is committed to action.

Combat arms units have learned to rely on ROM and some include it in their tactical plans. Units in the 1st Armored Division, III Corps, and the 11th Armored Cavalry Regiment, as well as others make ROM a routine part of their tactical operations. III Corps conducted the largest ROM exercise, to date during Reforger '87. During the exercise, the 1st Cavalry, and the 13th Support Command's (SUPCOM) active and reserve Petroleum Supply companies conducted ROM operations. These operations supported III Corps movement from its staging to its tactical assembly areas.

Until now, units put together their own ROM assembly. As mentioned previously, ROM points have consisted of any where from six to twelve refueling outlets; there was no standard design. Depending on the combinations of valves, hoses and nozzles available, commanders developed their own configurations, and no two unit's assemblies seemed to be alike. Many times, units developed ROM assemblies at the expense of their Fuel System Supply Point (FSSP). This occurred because an FSSP's hoses, valves, nozzles, pumps and filter separator can be used to conduct ROM operations.

When this happens, an FSSP's capabilities are degraded. Using this method, Refuel On The Move could work well in peacetime, but in a wartime scenario where both capabilities are called for simultaneously, problems could occur.

In establishing ROM assemblies, other units ordered additional equipment so as not to degrade

FSSPs. This action caused another familiar problem: excess equipment. Those units had to obtain local commander approval to order their version of the ROM kits.

In an effort to eliminate these problems, as well as to establish ROM capabilities as a known factor, the Quartermaster School (QMS) has developed a standard ROM assembly. The main goals of the development effort were to use the 5000-gallon tankers onboard pump and separator and standard POL equipment. After obtaining TACOM support for the project, QMS decided that the most expeditious means of authorizing the ROM assembly was to add ROM components to the authorized additions list of the M969 and M131C5000-Gallon Tankers. This standard assembly could be authorized for all units with these tankers.

The ROM assembly makes eight refueling outlets per tanker the standard. It consists of the following components: HOSE, DISCHARGE 3" X 50', NSN 4720-00-083-0048, 8 ea; HOSE, DISCHARGE, 1 1/2" x 25', NSN 4720-00-555-8325, 8 ea; TEE, ASSEMBLY 4" x 4" x 4", NSN 4730-00-075-2405, 1 ea; TEE, ASSEMBLY 3' x 3' x 1 1/2", NSN 4730-01-096-1039, 8 ea; NOZZLE ADAPTER 1 1/2", NSN 4730-01-115-5175, 8 ea; NOZZLE 1 1/2", NSN 4930-00-471-0288, 8 ea; REDUCER 4" x 3", NSN 4730-00-951-3293, 1 ea; REDUCER 4" x 3", NSN 4730-00-951-3296, 1 ea; VALVE, ASSEMBLY, BALL TYPE 3", NSN 4820-01-098-4925, 6 ea; GROUND ROD, NSN 5975-01-050-5707, 8 ea; and FIRE EXTINGUISHER, NSN 4210-00-257-5343. This assembly also provides additional adapters for the M131C, which allow the ROM assembly to be connected to its 2 1/2 inch aircraft delivery hose. The existing aircraft delivery nozzle will be replaced with fittings which will adapt the system

from a 2 1/2 inch thread to a 4 inch camlock. The 4 inch camlock will interface with the standard ROM assembly components.

The M969 uses three 4" x 14' suction hoses (Tanker BII) instead of the reeled 2 1/2" aircraft delivery hose to connect the ROM assembly to the tanker. When these components are hooked up to a 220 GPM pump, they will provide approximately 30 GPM at each nozzle. A trained crew will be able to deploy the system in less than 15 minutes.

The components are being added to the tanker Technical Manual (TM) allowing units to order an assembly for each of their tankers. The QMS recommendation states that units shouldn't need more than six assemblies per company. Using this basis of issue (BOI) a heavy division, for example, would have a total of 24 assemblies; six in each of the forward support battalions and six in the main support battalion. Divisional and non-divisional DS Supply Companies or GS Petroleum Companies will be able to order ROM assemblies.

The complete ROM assembly will cost approximately \$9,000. Initially, approximately 100 ROM assemblies will be fielded as free issues to authorized units who request them. TACOM is publishing a message to the field outlining the requisition requirements for the assembly. All components will be packed in one reusable wooden container, and shipped to the unit. One stock number, tentatively scheduled for release in March will be used to request all of the components that make up the

assembly; ordering units should not requisition entire ROM assemblies on an item by item basis. The TACOM message will provide final requisitioning instructions.

The ROM assembly is designed to be used as its name implies; while units are moving or ready to move. Refuel On The Move is not intended to replace the unit refueler when units are in contact. It must be remembered that any time forward refueling points are established with tanks or tankers, we become an excellent target of opportunity. The mobility afforded by using ROM and 5000-gallon tankers reduces vulnerability, but by no means nullifies it. That mobility also allows Refuel On The Move to be performed on a road march, in an assembly area, or an objective, and during exploitation actions. In short, any time the routine transfer of fuel will take place and the tracks are not in contact, ROM can be substituted.

Units at any level of the logistics chain can perform ROM. The higher the level of support tasked to perform the ROM the greater the number of lower level fuel tankers that remain topped off. If an FSB can perform the refueling, it allows battalion (BN) tankers to stay topped off; if an MSB is the refueler, the FSB and BN tankers both stay topped off. If Corps Petroleum Supply or Supply and Services (S&S) companies refuel the tanks all the division's refuelers stay topped off. A tradeoff may be required when DS and GS level supply companies (those that must also operate

FSSPs and FARES) are used. Refuel On The Move operation may require the same personnel as the FSSPs and as such a unit's ability to conduct DS or GS supply operations will be degraded.

The ROM Point should be controlled by the supporting unit. The vehicles should move in together and stop at designated refuel points. Refuel On The Move point operators will pass the fuel hoses to the vehicle crews, and perform refueling based on how much fuel is required by the greatest gas guzzler to meet the next objective. When that requirement is met, the pumps are shut down, hoses passed back, and vehicles prepared to move on signal.

Refuel On The Move operations have proven successful in many different situations, and its popularity is unprecedented. Still, each commander has to judge whether ROM will work for them. It's an alternative method for doing a job that has been and will be a Quartermaster POL function. Presently, the goal is to standardize ROM equipment and procedures in order to help our soldiers provide quality support in any situation.

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HEMTT TANKER AVIATION REFUELING SYSTEM (HTARS)

SFC MICHAEL E. ANDERSON

Historically, responsive Class III and Class V support, the provision of sufficient quantities of petroleum and ammunition in a timely fashion, has been a prerequisite for battlefield success. On today's Air-Land Battlefield, this support is not limited to ground vehicles, but is needed in the aerial arena as well. The very high mobility and combat flexibility of modern aircraft that makes them a singular asset makes their refuel and arming a challenge.

Rapid resupply of aircraft requires Class III and V support points as far forward as possible in order to be effective. This reduces the amount of time required to rearm and refuel aircraft, providing the commander with more time on station over target. In response to that need, the Quartermaster School, Directorate of Combat Developments and the Belvoir Research and Development Center developed the HEMTT Tanker Aviation Refueling System (HTARS) for use at Forward Army and Refueling Points (FARPS).

Forward Arming and Refueling Points are employed in various situations. Typically, they are used when the tactical situation will not permit a rapid turnaround at the unit trains, when time on station is to be optimized, or, when a rapid advance is being conducted. In the latter instance, unit trains would not be able to support an aircraft's advance.

Current aviation doctrine requires the rearming of one attack helicopter company (five attack and three scout aircrafts) simultaneously (the remaining scout and attack helicopters remain in the air for security). This allows a commander to concentrate his fire power, applying continuous pressure on the opposing force. The emergence of this doctrine has made it evident that the current Forward Area Refueling System (FARES) with its HEMTT Tanker does not fit the bill for the aviation community. The logistical burden of moving and setting up four FARES, or four HEMTT tankers is not flexible enough for rapid deployment.

That's where HTARS comes in. In response to the aviation needs, the Quartermaster School, Directorate of Combat Developments and the Belvoir Research and Development Center developed this system for use at FARPS.

The HTARS is a state-of-the-art, 4-point refueling system. It is constructed to provide the M978 fuel servicing HEMTT with the capability to simultaneously refuel four aircraft. The HTARS utilizes the M978's existing onboard 220 GPM pump and filter separator to issue fuel. The system consists of lightweight hoses, drybreak couplings and associated ancillary items. The HTARS contains everything needed to establish one com-

plete 4-point refueling system using only one HEMTT.

The system is designed to be stowed in the M978's cargo box. It can be deployed by two petroleum specialists (77F) and completely operational in less than 15 minutes. Using two HEMTTs equipped with HTARS an 8-point FARPS is established. This allows the aviation commander the capability to fully implement doctrine: he can now simultaneously refuel an entire helicopter company.

Prototype HTARS have been used successfully by the 6th Combat Brigade Air Cavalry (CBAC) since November 1986. HEMTT Tanker Aviation Refueling System will be issued to aviation units with a basis of issue (BOI) of one per aviation HEMTT, or seven HTARS per AH-64 attack helicopter battalion. The initial fielding of HTARS is scheduled for existing AR-64 battalions. The Apache Training Brigade at Fort Hood, Texas will also be included in the initial fielding. From there, HTARS will be issued as aviation units transition through the AH-64 training phase.

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PETROLEUM TESTING IN THE FIELD: The Airmobile Lab And The Manportable Test Kit

MSG STEVEN BELLAROSE

During the Vietnam Conflict, the extensive use and refueling of helicopters in remote areas demanded a means of testing petroleum far from laboratories at established bases. Moreover, a way to test petroleum in terrain impassable by ground vehicles was often needed. These requirements drove the development of an air transportable petroleum testing capability that came to be the Airmobile Laboratory.

Housed in a S280 shelter, a 15KW generator and a 5-ton cargo truck are supplied with each lab. When possible, the truck is used to move the laboratory to its destination. When this isn't possible, the Airmobile Lab can be transported by CH-47 helicopters, either sling loaded, or carried internally. This capability makes the positioning of the Airmobile Laboratory highly flexible, allowing it to be set up almost anywhere required.

The Airmobile Laboratory was designed around the critical user test for aviation fuel. As such, it was initially authorized only to units with high numbers of aircraft. Since then, aviation requirements within the Army have changed. Not only Aviation, but Heavy divisions have become highly dependent on their aviation assets: with that dependency comes a requirement for fuel testing capability.

The emergence of a single-fuel battlefield based on JP-8 has added to the need for Division level petroleum Quality Surveillance (QS). Given a single-fuel battlefield, all fuel must be handled as if its ultimate user will be aircraft. This means all fuel must be stored and issued as cleanly as possible, since any vehicle, air or land, can be refueled from the same tank of JP-8. Given these considerations, the heavy divisions must have Airmobile Laboratories.

Currently, only the 101st and 82d Airborne have Airmobile Laboratories. More laboratories are in production, tentatively scheduled for fielding to the 3rd Armored Division (AD), 3rd Infantry Division (ID), 1st ID, 24th ID (Mechanized), 2d AD, 5th ID (Mechanized), 8th ID, 1st Armored Cavalry, and in the National Guard - the 35th ID, 50th AD, 49th AD and the 40th AD during the 1st QTR FY 90. An additional laboratory

will be assigned to the Quartermaster School, at Fort Lee, Virginia for training purposes.

The Airmobile Laboratory is manned by three petroleum laboratory specialists (77L) in grades E-3 through E-5. It has numerous capabilities, including: testing for distillation and vapor pressure, to determine a fuel's ignition point and tendency to form vapor locks; testing for particulate contamination, to



assess a fuel's purity; flashpoint testing; and testing for the presence of icing inhibitors added to the fuel. Making these determinations is part of the total fuel quality surveillance needed to take advantage of any "Fuels of Opportunity". Without testing, no fuel, **particularly captured fuel**, can be used without risking harm to using equipment.

Although not authorized the Airmobile Laboratory and its truck, the Light Infantry Divisions' and separate Brigades' needs have not been forgotten. Responding to their requirements for mobility and to utilize non-technical personnel, the Army has assembled a man-portable Aviation Fuel Contamination Testing kit, LIN T-0-5741. Weighing in at approximately thirty pounds and packaged in a high impact plastic carrying case, this kit is authorized to all units with a refueling capability.

The man-portable kit is designed for use in combat situations.

Refueling personnel can test for particulate contamination, using the Fluid Sampling kit's filter pads to perform a visual comparison. Water in fuel can also be detected using the kit's Aqua Glo test. A Unit Density Testing capability is also available. (Every fuel has a specific gravity; as an example diesel fuel is an extremely dense and heavy fuel, Aviation gas is much lighter. Hydrometers are used to gauge that gravity.) This last function can be performed an indefinite number of times. The Aqua Glo test can be made 125 times and particulate contamination testing can be performed 48 times using materials issued with the kit.

The addition of the Airmobile Laboratories and the Aviation Fuel Contamination Kits to the Army inventory speeds the process of testing fuel for use on the battlefield. Since fuel need not be sent to fixed sites for testing prior to use, this allows for more mobility, with its in-

herent tactical advantage. It also affords the commander confidence in the use of captured fuels. Moreover, the testing kits give the commander not only an assessment of the quality of the fuel being used, but also if a unit's petroleum storage and issue equipment is clear of contaminants itself and functioning to remove contaminants from the fuel. Using these systems, quality surveillance of fuel, as well as petroleum equipment can be performed by any unit with refueling capability, no matter how far it finds itself from established testing facilities.

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"HIGH OCTANE SUPPORT" AT THE 260TH POL BN

CPT STEVEN A. CURLEE

"Never judge a book by its cover." Truer words were never spoken about the 260th Quartermaster (QM) Battalion (Petroleum Supply) (PS). Most logisticians think that Petroleum Supply Battalions are composed of two types of units: petroleum supply companies which store fuel, and petroleum truck companies, which distribute fuel.

As currently configured, the 260th offers much more to its supported units. Over the years, the 260th has developed into a multi-functional logistics battalion. Based in Hunter Army Airfield, Georgia and consisting of over 900 personnel, the 260th provides the four mission essential commodities to

survive, fight and win on today's battlefield: ammunition, bulk petroleum, transportation and medical support.

The battalion is currently configured with seven subordinate units, including its **Headquarters and Headquarters Detachment**. The **24th Ordnance Company** is a transportation/movement management detachment. The **51st Transportation Detachment**, is a direct support, conventional ammunition supply company responsible for Class V support. The **84th Transportation Company**, a light/medium cargo truck company, provides general cargo transportation. The petroleum storage requirement of the battalion is the

responsibility of the **110th Quartermaster Company**, a general support petroleum supply company, while the distribution of bulk petroleum is the responsibility of the **416th Transportation Company**, a medium truck petroleum company. The last of the 260th units is the **547th Medical Company**, a medical clearing company providing direct support medical services. The 260th provides installation and mission support to the 24th Infantry Division (Mech); the 1st Battalion 75th Ranger Regiment; and the Fort Stewart and Hunter Army Airfield (HAAF) installations lending support to the garrison mission, training, and daily training requirements of Corps level units.

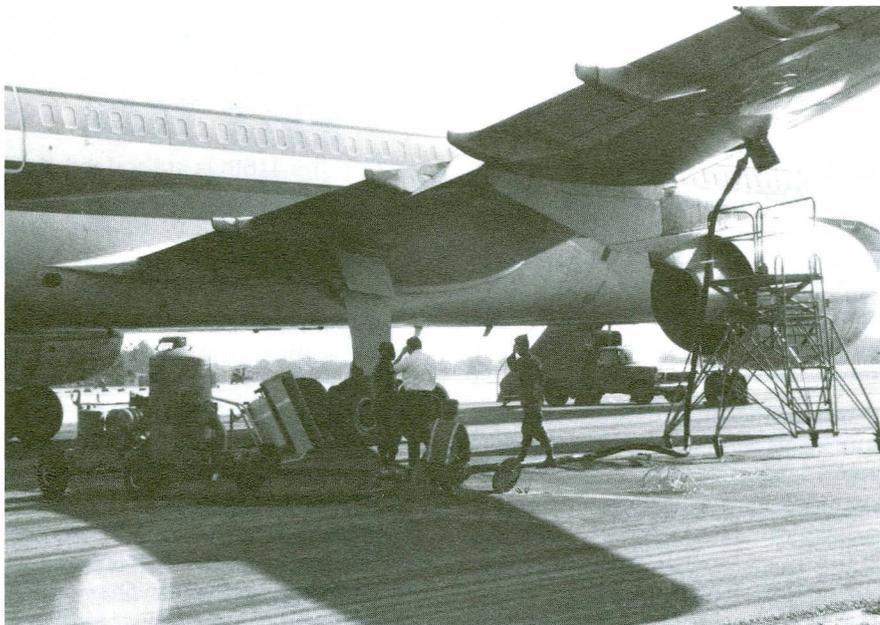
The 110th performs flightline refueling service.

Command and control of this diverse battalion is the responsibility of the **Headquarters and Headquarters Detachment**. All major staff elements are represented in the organization of the detachment. Still, a few things make this headquarters unique.

One of those is the 260th's mobile petroleum laboratory. It represents the latest in petroleum quality surveillance technology. The capabilities of the lab enable it to run all required tests for a full B-2 analysis, the most comprehensive quality surveillance test of petroleum products. The quality surveillance section is authorized seven 77L's (Petroleum Lab Specialists) who analyze approximately 150 samples per month.

Another element within the battalion is the **51st Transportation Detachment**. This unit provides transportation management services for all types of cargo. This is a critical mission, constantly required in large exercises. Recent deployments of the 51st include XVIII Airborne Corps exercises in Turkey and Italy. During these exercises the 51st is usually the first unit on the ground, and the last to leave. This allows them to manage the movement of personnel and equipment into, through, and out of the exercise area.

Also assigned to the 260th QM BN (PS) is the **24th Ordnance Company**. The 24th is a Direct Support Conventional Ammunition Supply Company. It has the capability, at ALO 1, of running two separate Ammunition Supply Points on a 24 hour basis. In garrison, the 24th Ordnance Company operates the Hunter Army Airfield Ammunition Supply Point (ASP). The Hunter ASP stores all training ammunition for non-divisional units, a portion of the 24th Infantry Division's basic load, and the entire basic load for the 1st Battalion, 75th Ranger Regiment (it is this unit that accounts for 75% of the ASP's workload with their frequent and varied training ammunition requests). Storage capability at the Hunter ASP is approximately 2,375 short tons.



The 24th Ordnance (OD) Company supports all National Training Center rotation made by the 24th Infantry Division. This usually requires one of its two magazine platoons to deploy for a three week train-up exercise, followed by the actual three week exercise. The 24th OD Company is frequently called on to support large tank and artillery gunnery exercises. There, they help the DISCOM's Forward Support Battalions practice the Ammunition Transfer Point (ATP) method of ammunition resupply.

Of course, bullets, grenades, and rockets are worthless without the transport capability to put them into the hands of our combat units. This is the mission of the **84th Transportation Company**, a light/medium cargo company. Equipped with 48 each, M35A2, 2 1/2 ton cargo trucks and 8 each 5-ton tractors with 16 S&P trailers, the company has a single lift capability of 1,100 short tons per day on local hauls. Five hundred fifty short tons per day can be moved on line hauls, or a total of 960 personnel can be moved in a single lift.

The 84th's primary peacetime mission is supporting the 1st Battalion, 75th Ranger Regiment with general transportation requirements. The company routinely has 50% of its assigned vehicles on the road supporting the Rangers. In recent years, parts of the company have deployed away from Hunter with the Ranger Battalion to provide support. In the last 12 months they have deployed to Great Britain, Puerto Rico, Fort Benning, Fort

Bragg, and Fort Gordon, as well as other locations.

Forces Command (FORSCOM) and XVIII Airborne Corps exercises requiring the 84th Transportation Company are also quite frequent. Last summer, the 260th deployed parts of the 84th CONUS for exercise "Display Determination" and this summer the 260th is identified as a member of an exercise during which it will support two Canadian Brigades in Alberta, Canada.

On ground storage and hoseline distribution of bulk petroleum is the responsibility of the **110th QM Company**. Its capabilities include the receipt, storage and issue of 1.5 million gallons of bulk petroleum, using 24 50,000 gallon collapsible fabric tanks and four Fuel System Supply Points (FSSP). Each of those FSSPs contains six 10,000 gallon collapsible fabric tanks. This storage capacity, combined with forty 350 gallon per minute pumps, provide a massive POL distribution capability.

The 110th also has two organic methods for the distribution of petroleum. Limited local haul is accomplished through the use of their eight 5,000 gallon tankers. The tankers are used to provide direct support petroleum supply to non-divisional direct support units in the Corps Rear, and limited Direct Support to large customer using units which cannot accomplish supply point distribution operations. This company's newest capability comes from its assault hoseline. Equipped with ten miles of 4 inch flexible hoseline, the company can pump well over 20,000 gallons per hour, for

rapid refuel forward to divisional units. Over a 24 hour period, that figure equates to over 100 tanker loads of fuel distributed without clogging the Main Supply Route (MSR) with a single truck. Garrison missions also keep the 110th extremely busy.

In addition to maintaining an enormous amount of equipment, the 110th also operates and manages all bulk petroleum for the installation. This includes operation of the post retail Petroleum point, and operation of the installation bulk POL storage facility. This facility has a storage capacity of 3.6 million gallons. Eventually, an increase to 5 million gallon capacity is planned.

Another of the 110th's critical garrison missions is the operation of Hunter Army Airfield's flightline refueling service. Fixed wing aircraft have access to the 260th's refueling capability at their parking ramp or at the airfield's hydrant refueling facility. Upgrade work on a third airfield pumphouse is nearing completion and will increase flightline storage capacity to a total of 1.5 million gallons.

Rotary wing aircraft also have use of the 110th's "Hot Refuel" facility located across from the hydrant facility. Utilizing equipment from their Fuel System Supply Points, the 110th has set up a two point hot refuel system. Open every duty day, this facility services an average of 275 aircraft per month. This is an outstanding training opportunity for our soldiers. Currently, this facility is the number one priority for a \$70,000 new work project which will allow the installation of a hard pipe system during FY 89.

The 260th QM BN manages a large amount of fuel; now let's see how that fuel gets onto the installation and how it will be moved in war. Both functions are handled by the **416th Medium Truck Company (Petroleum)**. Its mission is to distribute bulk petroleum via 5,000 gallon M-900 series fuel tankers. At

ALO 1, the 416th is authorized sixty 5,000 gallon tankers. This translates to a capability to line haul 500,000 gallons per day, or local haul 900,000 gallons per day.

In garrison the mission of the 416th is much the same as it is in combat. The only difference lies in the quantities distributed daily. Currently, the Defense Logistics Agency (DLA) has a contracted storage facility for bulk petroleum in Savannah, Georgia, at the Pan Ocean Terminal. At that facility, fuel is received from Military Sealift Command tankers and placed into storage.

Just as in combat, the unit is given short notice pickups and quantities that stress their available assets. During July 1988 the 416th hauled over 2.5 million gallons of JP4 from the port to HAAF. This fuel was used during the battalion's support of an Air Force exercise with B-52 bombers and presented the company with a challenging mission.

The newest addition to the battalion is the **547th Medical Company (Clearing)**. The 547th was assigned to the 260th QM BN 1 December 1988 and provides yet another critical link in our mission support role. The role of the 547th Med in war will be to receive, perform triage, hold, and provide emergency and resuscitative treatment for patients until evacuated, and to provide definitive treatment for patients with minor illness or injury. They also have the capability to establish Combat Stress Casualty Treatment Centers. These will be located near the division main support battalion medical clearing station and facilitate a maximum number of soldiers returned to duty within the division.

The unit is structured with three clearing platoons. Each is assigned one doctor and the necessary medical support. In garrison the company provides daily support to the Tuttle Army Health Clinic at Hunter Army Airfield and maintains a busy schedule supporting the 24th ID (Mech) and reserve units.

Daily missions and installation support keep the 260th QM BN extremely busy. In addition, one more mission has been assigned to the battalion. As the primary support unit for the 1st Battalion, 75th Ranger Regiment, the 260th is responsible for the operation of the Ranger Support Element (RSE), playing a primary role in the deployment of the Ranger battalion. As directed by the Commander, FORSCOM, and Fort Stewart Regulation, the 260th provides command and control of a 130 man RSE. This element deploys worldwide to sustain the Rangers for up to 10 days with prepackaged equipment and supplies. Resupply and augmentation allows for support for an indefinite period of time, much like that provided by a Forward Support Battalion. Support can be provided locally, or at any Intermediate Staging Base, as directed by mission requirements. Basic responsibilities for the battalion include running Arrival/Departure Airfield Control Groups (ADACG) in support of any deployment, dining facility support, billeting, maintenance, ammunition and of course, fuel and transportation support.

The 260th is a large battalion with a varied and critical mission. It supports both divisional and non-divisional requirements on a continuous basis. We are prepared to go to war, survive and win — always ready to provide "High Octane Support".

CPT(P) Steve A. Curlee, formerly S-2 of the 260th Quartermaster Battalion (PS), is now a Petroleum Management Officer, Transportation, Energy & Troop Support Division, Office of The Deputy Chief of Staff, Logistics, HQ USAREUR.

POL ON THE RED BALL EXPRESS

DR. STEVEN E. ANDERS

The introduction of motorized vehicles and equipment at the beginning of the twentieth century has changed forever the face of battle. Since the time of Alexander the Great large armies have crossed the world's military landscape with ponderous difficulty, their seemingly endless lines of animal—drawn carts and wagons trailing far behind. How different this is from the pace and dimension of modern warfare.

Today's mechanized Army has the ability to cover vast distances at speeds unimagined by even the greatest of the Great Captains of old. That speed brought with it a need for new forms of fuel -- in prodigious amounts to keep the engines of war running. Quartermasters who for centuries gathered huge stockpiles of hay, barley and oats to "fuel" past armies on the move, are now required to supply the petroleum, oil and lubricants (POL) that make up the U.S. Army's contemporary lifeblood.

"THE RED BLOOD OF WAR"

The Army had begun serious experimentation with gasoline driven trucks and automobiles as early as 1911. In 1916, during the "Punitive Expedition" to Mexico, trucks were first used in a tactical setting by American troops aboard.

When the United States declared war on Germany the following year, Pershing took hundreds of motorized vehicles and equipment with him to France. This action spawned a huge, new appetite for POL.

Though fighting on the western front was relatively static, petroleum played a decisive role. It was, according to Clemenceau, "as necessary as blood." The French expression "*le sang rouge de guerre*" "the red blood of war," captures the significance of gasoline in modern war fighting. Said Churchill

afterwards, we (the Allies) floated to victory "on a sea of oil." All told, the American Expeditionary Force consumed nearly 40 million gallons of gasoline in World War I. This was an immense amount for the time, a mere fraction of what it would take to defeat Hitler's Germany a generation later.

World War II was the first truly mechanized war, or as one observer put it, a "100 percent internal combustion engine war." It placed unprecedented demand on Army Quartermasters for POL support around the world. Even the relatively small North African campaign of (code-named Operation TORCH) required no less than 10 million gallons of gasoline. Allied logisticians pushed the red stuff forward over the beaches and across parched deserts using 5-gallon "blitz" cans, tanker trucks, and miles of newly designed portable pipelines. This experience, coupled with the Sicilian and Italian campaigns that followed, served as a warm-up for the Normandy Invasion of June 1944.

"POL SUPPORT FOR OVERLORD"

The cross-channel invasion known as Operation OVERLORD followed months of intensive preparation. During that time Allied logisticians in England worked out a detailed plan for POL support on the continent. All vehicles in the assault were to arrive on the beachhead with full tanks, carrying extra gasoline in 5-gallon jerricans. Packaged distribution was to continue throughout the operation's initial phase (D-Day to D + 41). Planners predicted a fairly slow-paced offensive thereafter, allowing for systematic construction of base, intermediate, and forward area depots. In the meantime, it was hoped that the early capture and development of

Cherbourg's port facilities (by around D + 15) would enable combat engineers to begin laying three 6-inch pipelines inland toward Paris.

Much depended upon the success of this operation. Pipelines were expected to eventually move about 90 percent of all POL entering the European Theater quickly and efficiently to forward area terminals or transfer points. Operation OVERLORD was officially scheduled to terminate on D + 90 with the forward line hopefully anchored on the banks of the Seine. The post-OVERLORD period (D + 91 to D + 360) would have the Army pushing steadily eastward to the Rhine, where it was assumed a final showdown would take place. From start to finish, planners expected well-placed bulk maintenance facilities to carry the lion's share of POL support.

On D-Day itself events occurred much as planned from a POL perspective. The first assault vehicles rolled ashore and immediately began stacking their cargoes of 5-gallon cans. They were placed in small, widely scattered dump sites throughout the lodgment area. This simple method of open storage made Class III supply easily accessible. At the same time, this storage method rendered Class III supplies less vulnerable to enemy attack. By the end of the first week (D + 6) Quartermaster petroleum supply companies were on hand to begin moving these stores away from Omaha beach as the buildup continued.

German defenders fought tenaciously but failed to turn back the allied assault. By the end of June, the beachhead had expanded considerably. Allied combat units were rushing headlong in the infamous hedgerows some 25 miles beyond — there to engage in a bloody slugfest that lasted several weeks. The Allies' inability to score a quick

breakthrough anywhere along the line had both positive and negative effects on the supply situation. Since there was so little forward movement, reserve stockpiles grew at an accelerated pace. Approximately 177,000 vehicles and more than half of a million tons of supplies came ashore by D + 21. POL reserves at that time topped 7.5 million gallons. On the other hand, failure to capture Cherbourg as early as planned meant that the proposed pipeline schedule had to be voided. For weeks to come, all POL requirements would have to be met solely by packaged distribution.

"BREAKOUT AND PURSUIT"

A breakout finally occurred the last week of July. Following a massive aerial bombardment on the 25th, General Bradley's First Army managed to rupture German lines to the right of St. Lo. The next day, three armored divisions poured rapidly through the gap and moved 25 miles south near the base of the Contentin peninsula. With the door forced wide open, new opportunities

for early tactical success abounded. There was a chance that if the Allies moved fast, struck hard and pressed the fight, they might quickly defeat the entire German Army in France. In light of this largely unforeseen possibility, many of the preinvasion plans were summarily scrapped. First and Third Armies joined forces on 1 August (to form the U.S. 12th Army Group) and at once began exploiting the principle of maneuver warfare to the fullest.

The Germans offered even lighter resistance than expected. Success followed success in the Allied pursuit across France. As Patton's Third Army swept westward into Brittany and south to Le Mans, it burned up an average of more than 380,000 gallons of gasoline per day. By 7 August (a week after becoming operational) its reserves were completely exhausted. Patton had to rely on daily truck loads of packaged POL from the rear. Nevertheless, he managed to continue this highly mobile type of warfare, driving eastward for another three weeks, before being halted by critical shortages of gasoline.

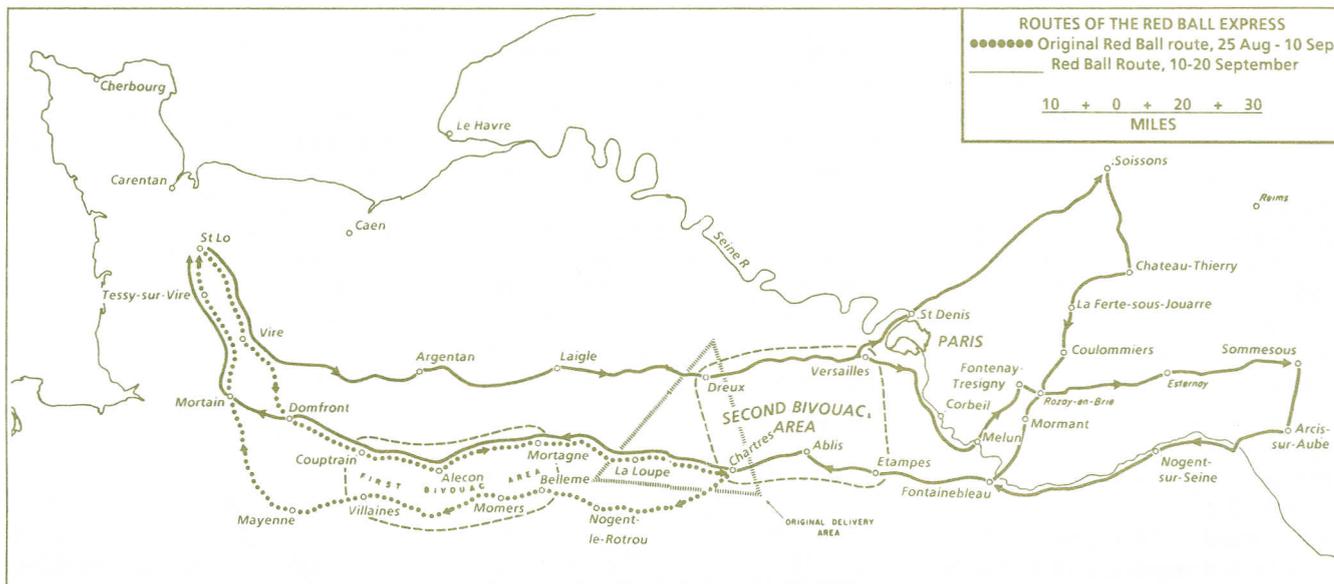
Stack of empty jerricans left at dump sites after exchanged for full ones . . .



Logistically speaking, the real turning point in the campaign came during the week of 20-26 August. At that time, elements of both the First and Third Armies were simultaneously engaged in rapid pursuit. They developed an insatiable thirst for gasoline, and consumed more during this one week than any time previously. Average consumption was well over 800,000 gallons per day. The First Army alone (with about 60 percent of its total supply allocations made up of Class III type items) used 782,000 gallons of motor fuel on 24 August. The next day Allied forces closed in on the Seine and columns of U.S. and French troops entered Paris.

The decision to cross the Seine and immediately continue eastward, without waiting to more fully develop lines of communication, constituted a major departure from the OVERLORD plan. It posed serious difficulties for theater logisticians, but was a gamble senior commanders were willing to risk. "The armies," said General Bradley, on 27 August, "will go as far as practicable and then wait until the supply system in rear will permit further advance." Once across the Seine, forward divisions not only extended their lines, but fanned out in every direction creating a front twice as broad as previously. The strain on the supply system was immediately noticed as deliveries slowed to a trickle. The late August-early September operations were described by war correspondent Ernie Pyle as "a tactician's hell and a quartermaster's purgatory."

Indeed it was both. Believing victory to be firmly within their grasp, the fast-moving armies had outrun their supply lines and were forced to live hand-to-mouth for several days. Ninety to ninety-five percent of all supplies on the continent still lay in base depots in the vicinity of Normandy. The First Army had in effect "leaped" more than 300 miles from Omaha beach in a month's time. Third Army had done likewise. With the situation becoming daily more critical, it was time to begin what one historian labeled "frantic supply."



"RED BALL TO THE RESCUE"

In a desperate effort to bridge the gap between user units at the front and mounting stockpiles back at Normandy, a long-distance, one-way, "loop-run" highway system—the famed Red Ball Express—was born. Since circumstances allowed little time for advance planning or preparation, Red Ball was, as one observer noted, "largely an impromptu affair." It began on 25 August, with 67 truck companies running along a restricted route from St Lo to Chartres, just south of Paris; and reached a peak four days later with 132 companies (nearly 6,000 vehicles) assigned to the project. Communications Zone (COMMZ) and Advance Section (ADSEC) transportation officials were responsible for overseeing Red Ball activities, but it required the support and coordination of many branches to succeed. While the Engineers were busy maintaining roads and bridges, MPs were on hand at each of the major check points to direct traffic and record pertinent data. Colorful signs and markers along the way—not unlike the old Burma-Shave signs that covered

A brief rest stop on the Red Ball Express convoy route near Boissons, France.

America's own countryside—kept drivers from getting lost, and at the same time publicized daily goals and achievements. Quartermasters truck drivers, materiel handlers and petroleum specialists were ever present both along the route and at the forward area truck-heads. Disabled vehicles moved to the side of the road, where they were either repaired on the spot by roving Ordnance units or evacuated to rear area depots.

Round—the—clock movement of traffic required adherence to a strict set of rules. For instance, all vehicles had to travel in convoys and

maintain 60-yard intervals. They were not to exceed the maximum speed of 25 mph and no passing was allowed. After dark Red Ball drivers were permitted the luxury of using full headlights instead of "cat eyes" for safety reasons. At exactly ten minutes before the hour each vehicle stopped in place for a 10-minute break.

Bivouac areas were set up midway on the roads so exhausted drivers could get some rest and a hot meal. (Incidentally, most drivers soon picked up on handy tricks that come from living on the road, such as how to heat C-rations on the



manifold or make hot coffee in a number-10 can using a bit of gasoline.) At its height the Red Ball saga captured the media's attention, and had the effect of placing supply and service personnel in the spotlight for a change. Still, the job was hardly glamorous, involving as it did endless hours of dull, hard, and sometimes dangerous work, POL occupied prominent space on the Red Ball Express.

In late August, Eisenhower decided to forward most petroleum supplies to the First Army (Hodges) and the British 21st Army Group (Montgomery). This action was to come at the expense of Patton's Third Army to the South. On 31 August, Patton's daily allotment of gasoline dropped off sharply from 400,000 to 31,000 gallons. This placed a virtual strangle hold on the fiery commander, who fumed, pleaded, begged, bellowed and cursed accordingly—but to no avail. "My men can eat their belts," he was overhead telling Ike at a meeting on 2 September, "but my tanks gotta have gas." The logistical crisis threatened to halt the Allies where the enemy could not.

Fortunately, that crisis proved to be shortlived. It would only be a slight exaggeration to say that Red Ball saved the day. The hastily conceived system served as a useful expedient for bringing Class III items, especially gasoline, quickly to the fuel starved front. Even though First and Third Army supply officers would continue bemoaning the gas shortage, the situation got markedly better. By the end of the first week in September, forward area truckheads were issuing POL as soon as it came in, and consumption rates were once again hitting the 800,000 gallons a day mark. The worst of Patton's gasolines woes ended almost as quickly as they had begun. Mid-September saw the two American Armies issuing in excess of one million gallons of gasoline daily—enough to meet immediate needs and begin building slight reserves.

Red Ball was scheduled to run only till 5 September, but continued through mid-November. In all, it transported more than 500,000 tons of supplies. The system moved fuel quickly, if not always efficiently, to where most needed to keep the drive alive. Most importantly, the Red Ball Express brought precious time for the rear echelon support team, allowing it to complete its task of building up the railroads, port facilities, and pipelines needed to sustain the final drive into Germany.

SUMMARY

For over two months, the Red Ball Express did a magnificent job transporting petroleum over distances up to 400 miles. Quartermasters did their part by operating effectively as retailers of this product. However, success came with a price tag. Round-the-clock driving strained personnel and equipment. Continuous use of

vehicles, without proper maintenance, led to their rapid deterioration and ultimately to a drain on parts and labor. Tire replacement alone nearly doubled from 29,142 just before Red Ball was launched to 55,059 in September. The situation was aggravated by driver abuse, such as speeding, and habitual overloading. Extreme fatigue also led to increased accidents, and even a few instances of sabotage, where drivers disabled their vehicles in order to rest.

Red Ball proved beyond a doubt the versatility and convenience of transporting gasoline in small 5-gallon containers. Jerricans required no special handling apparatus and were amenable to open storage without harmful effects. However, at the very height of Red Ball activities forward movement of POL was threatened by a severe shortage of jerricans. The cans were carelessly discarded from the beachhead area and littered the route all the way to the front. The Chief Quartermaster's highly publicized propaganda blitz and cash incentive program prompted local civilians to help round up "AWOL jerricans." Still, a jerrican shortage remained in effect until more cans were manufactured on the home front.

Finally, the Red Ball Express had an inherent problem in that it was fast approaching a point of diminishing returns. As the route got longer and longer, the Red Ball required more gasoline—ultimately as much as 300,000 gallons per day—just to keep the Red Ball vehicles themselves moving.

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More than 500,000 gallons of gasoline were transported in 5 gallon jerricans.



GERMAN LOGISTICS FAILURE:

THE LESSON OF OPERATION BARBAROSSA

MAJ FRANK WRIGHT

The art of logistics during combat is a highly complex, often misunderstood, time and labor-intensive operation. It can mean the difference between success or failure on the battlefield. Campaigns at the operational level have repeatedly demonstrated that commanders often fail to allocate sufficient resources to logistics. Along the same lines, there is often a lack of appreciation for the tremendous demands born of combat operations carried on over significant distances. Leaders have over-extended their lines of communication, and moved beyond sustainment to the detriment of combat effectiveness. The result: defeat.

Carl von Clausewitz referred to the phenomenon as a units "culminating point." When reached, the attacking force has expended so much of its strength that it no longer has a significant tactical advantage against the defending force. At the same time, the attacking force loses its momentum and becomes over-extended, vulnerable to counterattack and defeat.¹

Numerous campaigns, dating back to the time of Napoleon support Clausewitz's operational theory. The classic example dates to World War II and the German invasion of Russia known as Operation BARBAROSSA. Analysis makes it clear that Hitler and the German General Staff had not fully considered the logistical requirements of the operation. This led to a failure to adequately prepare and sustain the German Wehrmacht, and its ultimate defeat.

In July 1940, an overconfident Adolph Hitler focused on his next strategic objective—Russia. Preceding this, the Wehrmacht's blitzkrieg campaign had quickly numbered phenomenal victories: Poland was won in four weeks, Norway—nine; Holland—seven; Belgium—seven and France—seven. Compelled by those victories to maintain his momentum, Hitler

chose to invade Russia. The decision was made despite obvious internal logistical problems, and an inadequate supply of critical war materiel needed to support a campaign of such magnitude.²

Following eight months of extensive planning by the German Army General Staff (OKH) and the Armed Forces High Command (OKW), Hitler approved Operation Barbarossa in February 1941. Execution was to take place after the spring thaw of the same year. Based upon principles of speed and surprise, BARBAROSSA was to be the largest combat campaign in history.

The magnitude of the operation was mind boggling—3,000,000 troops moved forward along a 1,200 mile front. This invasion force was considered by the Reich to be superior in every area to the Red Army. It consisted of crack German troops seasoned by at least one previous campaigns combat experience and leaders handpicked from the cream of the Wehrmacht. It was the most modern, successful and technically advanced combat force in the world. Still, it had a substantial Achilles heel—logistics. In that arena "the Fuhrer had no interest whatsoever".³

One of the most critical errors of the BARBAROSSA campaign was inadequate preparation. Full wartime production was not in effect before the invasion; German factories were operating on a single shift basis. This under utilization of German industrial capability resulted in shortfalls of essential combat materiel production. Production consistently lagged behind consumption, leading German panzer divisions to invade Russia while critically short of authorized tanks. Further, war reserves did not exist, or, were not large enough to constitute a viable contribution.⁴

German production failures also contributed to insufficient transportation resources. In 1940,

truck production was so low that the Army received only 1,000 trucks per quarter. This amounted to replacements for about half the normal losses. As a result, the Wehrmacht conducted a major demotorization program, procuring horses and wagons to offset the critical truck shortage. The transport of supplies became more dependent on horse, than motorized power.⁵ During BARBAROSSA, the Wehrmacht relied on more than 625,000 horses.⁶

For the harsh environment and inadequate roads of Russia the German troops needed durable tactical vehicles and tracked prime movers. However, when the Wehrmacht invaded Russia, it did so with 2,000 different types of vehicles. That number reflected numerous captured vehicles of varied nationalities—many only suitable for operation on paved surfaces.⁷ The Central Army Group alone required over 1,000,000 spare parts. This lack of vehicle standardization, along with the inability of many of those vehicles to operate on unimproved roads had a catastrophic effect on operational capability.⁸

In *Strategy For Defeat*, Williamson Murray states that the superficial attention that the OKH and OKW paid to the logistics of sustaining the Wehrmacht inside of Russia was one of the most glaring defects of the preinvasion strategy. It did, however, reflect the Wehrmacht's overly optimistic approach to logistics overall. In planning the invasion, the OKH and OKW assumed that the Wehrmacht's blitzkrieg tactics, speed and surprise, would allow a rapid penetration of Russia and the quick destruction of the Red Army. Throughout the invasion, the plan was to rely on the Russian railroad system to sustain the force. This plan did not take into account that the German railway troops (Eisenbahntruppe), responsible for the conversion of the Russian railroads,

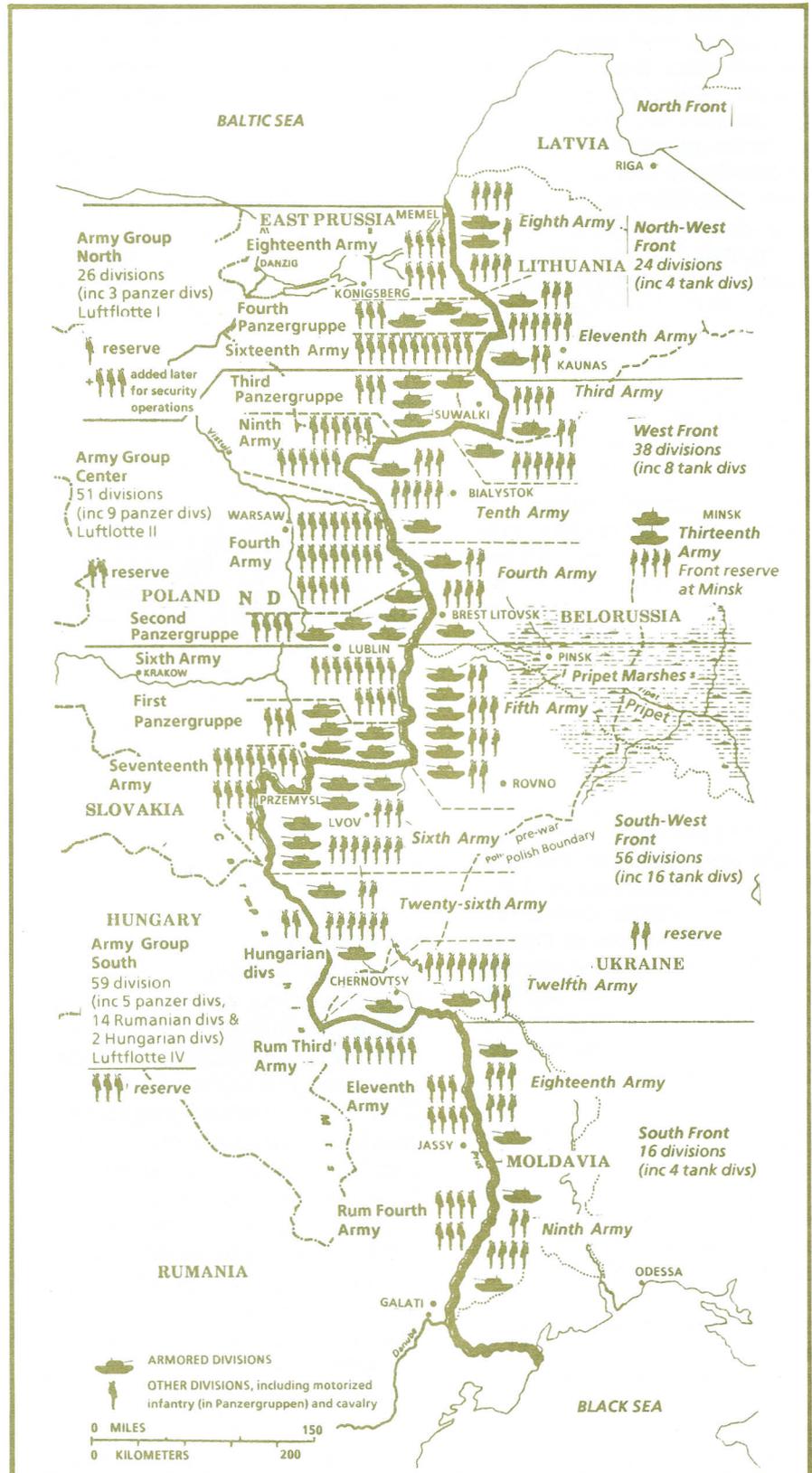
Figure 1. Barbarossa: Order of Battle, 22 June 1941.

as noncombat units were nearly last in the Army's order of priority. Their low status was reflected by a severe lack of vehicles (two-thirds were without motorization), communications equipment, training and personnel.

At 0300, on Sunday, 22 June 1941, (ironically the 129th anniversary of Napoleon's ill-fated Grand Armée invasion of Russia) Operation BARBAROSSA began. Hitler unleashed the total destructive capability of the German blitzkrieg against 150 Red Army divisions along Russia's western frontier. Numbering 144 divisions and over 3,000,000 troops, the Wehrmacht invaded Russia along a 1,200-mile front. (See Figure 1.) The Germans achieved a total surprise, with spectacular results. By 19 July, they had captured Smolensk, an intermediate objective to Moscow. There, 387,000 prisoners were captured, 2,600 aircraft destroyed, 5,558 tanks and 1,900 artillery pieces captured or destroyed. The Reich prematurely concluded that the war was won.¹⁰

Following those tremendous initial successes, Hitler's Wehrmacht bogged down due to logistics failures. A prime example involves supply movement. The German support concept relied on railroads to move supplies from the zone of the interior, to forward railheads. Motor transport was to move those materials from the railhead to the front. Although theoretically feasible, the system could not keep up with the rapid advances of the Panzer divisions and consistently fell behind. The deeper the front penetrated, the longer the lines of communication became, and paralleling this, the greater the challenge to sustain the battle.

By August, the motorized supply system was exhausted. Ammunition, the requirement for which was previously under estimated—



The old axiom that "amateurs study tactics and professionals study logistics" was clearly demonstrated by Hitler and the German General Staff.

competed with fuel for transport. Both were in limited supply. Hitler's lines of communication stretched. Spanning 600-miles initially, they eventually expanded to 1,200. As the invasion advanced those lines became unmanageable and unable to satisfy continuing logistics demands.¹¹ Front line units were soon operating on a hand-to-mouth existence. Stretched to its limit, the state of German supply lines created a logistical nightmare.

By October, with resources strained to the maximum and troops ill-prepared for the approaching winter, the German situation on the Russian front took a turn for the worse. The weather quickly deteriorated. Conditions rapidly became sub human, supply systems failed and it was more a question of surviving than of fighting.¹² Statistically, "Men and machine were operating at 20 percent efficiency."¹³

On 20 November 1941, General Heinz Guderian, Commander of Panzer Group 2 and architect of the German Panzer Corps, described the logistical situation on the Eastern Front in a letter to his wife: The icy cold, the lack of shelter, the shortage of clothing, the heavy losses of men and equipment, the wretched state of our fuel supplies, all this makes the duties of a commander a misery and the longer it goes on the more I am crushed by the responsibility which I have to bear.¹⁴

Finally, on 6 December 1941, after 168-days of continuous combat and within 19-miles of Moscow, the most modern and powerful armed force in the world was nearly exhausted. They were half-starved and half-frozen; out of fuel, ammunition, and luck. The overstretched 1,200-mile supply lines, exacerbated by severe transportation and weather problems, had proven to be grossly ineffective. The result was the Wehrmacht's inability to sustain the battle (see Appendix 6). Yet, despite their precarious condition, the disciplined Wehrmacht tried desperately to reach Moscow. During the final surge, Stalin's Red Army counterattacked, forcing a hasty retreat of Hitler's forces.

In *Military Errors of World War II*, Kenneth Mackey concludes that during the planning of BARBAROSSA many of the deficiencies experienced had been "sidestepped or ignored on grounds of economy or because Hitler and many of his commanders had deluded themselves into believing the war would be won long before winter took its toll."¹⁵ They had gambled and lost.

The old axiom that "amateurs study tactics and professionals study logistics" was clearly demonstrated by Hitler and the German General Staff. Analyzing the operation in retrospect, we can conclude that the German invasion was doomed to failure from the beginning. The Third Reich's ineffective

logistics planning and inability to logistically sustain the battle resulted in the invasion force's reaching its culminating point short of the campaign's objective. As Hitler pushed the force further to Moscow, the army became overextended, and the campaign was lost. Despite total tactical surprise, superior equipment, crack troops, and brilliant leadership, the Wehrmacht's inability to sustain the battle resulted in failure of the invasion and ultimately contributed to the defeat of the Third Reich.

Operation BARBAROSSA's failure clearly confirms General Dwight D. Eisenhower's appreciation of logistics gained from his operational experience: "You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics".¹⁶

Operation BARBAROSSA provides graphic evidence that today's operational commander must thoroughly forecast, plan and allocate resources for adequate logistical support. Failure to do so will have an adverse impact on the organizations sustainability and combat effectiveness, and directly affect the commander's ability to achieve strategic objectives. This will cause the unit to reach its offensive culminating point before achieving its operational objective, resulting in vulnerability to counterattack and potential defeat on the battlefield.

APPENDIX — LOGISTICS FAILURES PRIOR TO DEPLOYMENT

Logistics Planning: Overly optimistic and totally unrealistic; planning factors were often determined by capability rather than actual requirements; near total dependence on the use of the Russian rail system and antiquated horse drawn supply wagons to sustain the force; unprepared for prolonged sustainment.

Command and Control: Logistics system lacked unity of command; transportation responsibilities were split between the Chief of Transportation (rail and inland waterways) and the Quartermaster-General (motor transport).

Motor Vehicle Production: Germany's motor vehicle industry was inadequate to support war-time requirements; production could replace neither normal wear and tear nor keep up with combat losses; OKH demotorization program replaced trucks with horses due to acute shortage of motor vehicles.

Force Structure: Severe shortage of motor transportation units; only three motor transport regiments (Grosstransportraum) with a total capacity of 19,500 tons. In comparison, the Allies had 69,400 tons capacity and still suffered significant difficulties.

Fuel: Critical shortages due to a lack of natural resources; inadequate war reserves of three months with less than a 30-day supply of diesel fuel.

Spare Parts: Extremely limited supplies; hampered by proliferation of vehicles due to the use of captured vehicles from previous campaigns and competing demands from new vehicle production; Central Army Group alone required over 1,000,000 different repair parts.

Rubber: Nearly impossible to obtain tires; rubber production came to a near complete standstill due a lack of raw materials; steel-shod wheels used in lieu of rubber tires.

Ammunition: Planning requirements were inaccurately based on transportation capability rather than operational consumption.

Maintenance: Lack of heavy repair capability forward deployed; heavy maintenance units remained in Germany or Poland based on the incorrect assumption of no requirement due to the short duration of the campaign.

Climatic Conditions: Gross underestimation of requirements ranging from cold weather clothing to antifreeze; based upon the inaccurate planning assumption of completion of the campaign before winter.

Lines of Communication: Failure to fully consider LOC length and impact of weather on main supply routes; transport vehicles lacked necessary capability to operate over unimproved Soviet roads.

Rail System: Over dependence on railroads to sustain the invasion resulted in gross supply failures; German and Russian rail systems were incompatible; required conversion from Russian wide-gauge to standard gauge; German Eisenbahnruppe unable to keep up with tactical advances; cargo transfer points from German to Russian system used in lieu of converting rails creating major bottlenecks; German locomotives lacked capability to operate in extreme cold temperatures; logisticians unable to manage system eventually losing control of rail resupply operations.

Resupply Failures: Wehrmacht's greatest failure was its inability to sustain the force; excessive long lines of communications, over dependence on railroads, severe shortfalls in motor transport capability, and untrafficable roads resulted in total collapse of the supply system resulting in diversions of supplies, hoarding and a total lack of confidence in the supply system; resupply could not sustain the battle.

Motor Transport Capability: Severe shortage of motor transport especially at echelons above division used to move supplies from railheads forward; shortages throughout the Army filled with non-standard, captured motor vehicles or horse-drawn vehicles (625,000 horses used to support BARBAROSSA); invasion fleet lacked durability and capability to operate over unimproved roads; lack of standardization affected repair parts.

Rations: Shortfalls in the ration resupply system resulted in 'slaughter' platoons being formed within divisions as field expedients; relied on foraging local livestock to feed the soldiers; continued shortages resulted in troops eating units' horses as a last resort.

Cold Weather Clothing: No provision for cold weather clothing based upon inaccurate planning assumption; troops resorted to stuffing newspaper into summer uniform to keep warm; urgent requests from the front never satisfied due to transportation problems; 14,000 amputations resulted from frostbite during winter of 1941-42.

Fuel and Ammunition Shortages: Resupply could not keep up with advances; commanders unable to exploit tactical advantage because of severe shortages of fuel and ammunition; tactical operations curtailed for weeks waiting on resupply the rear.

Maintenance: Lack of standardization resulted in proliferation of repair parts; harsh operating conditions resulted in excessive maintenance problems exacerbated by lack of maintenance units within invasion force.

Replacements: Unable to replace losses; casualties grossly exceeded replacement rate; severe attrition of troops and trained leaders impacted on operational effectiveness of units.

Antifreeze: No provision made for extreme cold temperatures in Russia (down to -40 F); vehicle engines froze, artillery and rifles rendered useless by frozen lubrication.

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LOGISTIC POWER: A NEW PRINCIPAL OF WAR

MAJ RICHARD A. BURSELL

Logistic considerations belong not only in the highest echelons of military planning during the process of preparation for war and for specific wartime operations, but may well become the controlling element with relation to timing a successful operation.¹

—Vice Admiral Oscar C. Badger

Logistics should be recognized as one of the principles of war. Heresy? Before writing off such an audacious challenge to the "catechism" constituted by the principles of war, a little review of the definition and origins of those principles is in order. In doing so, we can determine if logistics meets the criteria and whether it should be formally recognized as one of those principles.

Throughout the history of warfare, many theorists and historians have "discovered" certain principles of war. These principles explain the success or failure of various wars, campaigns, or battles. Their definition is nebulous, and subject to disagreement by military theorists. At mildest, they have been referred to as "merely guidelines or aids to the military thought process."²

The principles apply to each armed conflict and possess an enduring character which changes only in the method of application. Regardless of definitional disputes, there is widespread agreement that a principle of war exists as a "fundamental truth."³ Those simple truths underlie each armed conflict and serve to illustrate by their application whether any battle is won or lost.

The great principles of war are "not to be violated with impunity."⁴ Straying from their guidance can have disastrous consequences, as military history illustrates time and time again in its analysis of failures and catastrophic losses.

Does logistics fall into this category? The word itself stems from the Greek "logistikos" which

means "skilled in calculating."⁵ For the purposes of this article, logistics refers to the movement, supply, and maintenance of military forces. Does a review of military history depict logistical success or failure as an explanation of the outcome of armed conflict? A few examples from World War II serve to illustrate that logistics does emerge as a fundamental truth of battle, be it at a theater, operational, or tactical level.

The Normandy invasion serves as a prime example. Few people realize that Operation Overlord was not a strategic goal, or a tactical plan for the invasion of Europe. Instead, its singular goal was logistic. When military planners drafter the purpose of order for Operation Overlord to read "To secure a lodgement on the continent from which further offensive operations can be developed,"⁶ it reflected the "fundamental truth" of the need to establish a logistic power. At the theater level, it was the vision of establishing a logistical base that became the first step in piercing Fortress Europa ensuring that the thousands of troops that followed would be properly armed and equipped. Recognition of that requirement for a base of sustainment contributed significantly to Allied success during WW II.

The Battle of the Bulge dramatically demonstrates the impact of logistics on a major operational conflict.⁷ Like Patton's earlier offensive, the German counteroffensive was seriously hurt by logistical weakness. Combat service support could not keep up with the advance of German combat formations. As a result, needed materiel could not be

transported to the front. When this occurred German troops ran out of ammunition and fuel.

The list of German logistical failures at the Battle of the Bulge does not end there. A lack of repair parts resulted in trucks lost to mechanical failure and battle damage. Further, German planners did not anticipate the bad terrain and poor weather "which reduced by one-half the mileage-per-tank consumption"⁸ of fuel previously projected. Petroleum shortages were made worse by the German failure to capture any large amount of Allied resources. Finally, German tank losses were high, attributable as much to mechanical failure and a lack of recovery vehicles as to battle damage.⁹ Most of these logistical nightmares could have been overcome had Hitler truly understood the logistics needs of his Army¹⁰ as a principle underlining the battle. Still, logistical oversight was not limited to the German forces of World War II, nor to the higher echelons.

A classic example of a U.S. Army logistical snafu at a tactical level occurred in March 1945. At that time, LTC Creighton Abrams received an order from Patton's headquarters to dispatch an armored task force. Their mission would take them sixty miles behind enemy lines to a POW camp. To ensure speed and firepower, no ammunition, supply, or maintenance vehicles accompanied the task force. Extra fuel was carried on jerricans strapped to the tanks.¹¹ After an initial penetration, the Germans closed behind the task force. Some vehicles were destroyed by fire ignition of the jerricans. Others were abandoned due

A principle of war is more than a goal it is also a cautious word to the military commander.

to mechanical malfunction or lack of gas. After losing nearly two-thirds of the task force, the unit finally arrived at the POW camp.

The task force members succeeded in making an initial breakthrough and rescuing the POWs but their resources were wholly depleted. Immediately thereafter, they were quickly surrounded and, like those they rescued, made POWs. The logistical lesson to be learned from this operation is fairly straight forward: there is a need to field a balanced force "with the requisite number of fighters...and sustainers."¹²

These examples demonstrate the consequences of remembering (or not) that logistical power is a fundamental truth, a strength when, and a weakness when not, a consideration in any armed conflict. Although the Soviets almost explicitly recognize logistics as a principle of war,¹³ the U.S. to date has not. Why not?

It's Not Pretty Stuff

Lip service is all that's generally paid to the importance of logistics in warfare, and few books are dedicated to its serious study. Hundreds of books on strategy and tactics have been written for every one on logistics.¹⁴ Human behavior may be the reason why.

Logistics is an "unexciting aspect of war"¹⁵ which involves mathematical problems in calculating the movements and supply of armies. While Jomini listed logistics as one of the six general divisions in the art of war,¹⁶ his works were read mainly for their strategic and tactical lessons.¹⁷ Clausewitz did not recognize logistics as playing a part in the conduct of war; war was strictly strategy and tactics. Logistics, in his perspective, was a "subserving service"¹⁸ insignificant in the actual clash of

war. In putting forth this view, Clausewitz reflected the standard "prejudice of fighting men against the non-combat service."¹⁹

Human nature begs stimulation, and this helps to explain the greater interest in the more exciting aspects of warfare. One author has made a striking analogy:

Strategy is to war what the plot is to a play. Tactics is represented by the role of the players; Logistics furnishes the stage management, accessories, and maintenance. The audience, thrilled by the action of the play and the art of the performers, overlooks all of the cleverly hidden details of stage management.²⁰

Another possible explanation of the absence of logistics in our lists of the principles of war may be found in an examination of when they originated, and who wrote them. The U.S. Army adopted its principles of war from the writings of British Major General J.F.C. Fuller.²¹ It is important to note that Fuller produced his "complete" list before 1912²², before the start of WWI, and all the valuable "truths" learned from those experiences came to light. Fuller's battlefield is not the one we face today.

Why should today's Army formally recognize logistics among their principles of war? The advantages of admitting logistics to the list of fundamental truths of armed conflict are three-fold: First, formal recognition stresses the importance in military operations and planning. Logistics underlies as much as nine-tenths of the business of war.²³ Its formal codification as a principle of war, as a guide to military thought, is long overdue. As mentioned previously, it is already part of the Soviet military system.

Secondly, formal recognition will help in impressing and maintaining a sense of reality in the planning

and adoption of military operations. History teaches us that theater, operational, and tactical conflicts will not succeed without the pragmatic considerations of subsistence, ammunition, repair parts, fuel, and transport. What appears to be an apparent capability on a commander's board map is brought face to face with an often harsh reality when logistical considerations are factored in.

Third, the inclusion of logistics among the principles of war will sharpen the mental skills of our present and future military leaders. It will keep us and our successors mindful of the importance of logistics in military history and of the necessity to use a balanced and mature judgment when moving with the offensive posture of agility, audacity and initiative on the battlefield. A fine line must be discerned and then drawn between reckless proposals and boldness—that line is established by logistical acumen.

The current principles of war contain truth to guide commanders' thought processes. They are philosophical ideas which explain past, and guide future behavior. However, it must be recognized that principles written prior to WWI may need to be reexamined with the lessons of more recent battlefields in mind.

The massive conflicts of the 20th century have taught us that logistics is a fundamental truth. It has guided commanders in the past, and will guide them in the future. Ignoring that truth can mean the difference between success and failure on the modern battlefield; formal recognition of logistics as a principle of war will disallow that ignorance.

Bibliography follows on page 24.

**The principles we know are not
unalterable maxims written in stone,
nor do they exist never to be challenged.**

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First Law: Be prepared. Prepare in peacetime for the next war. Forces-in-being are the decisive factors. The side with the most and best troops and equipment at the start of war will win the war.
Second law: The side which can best sustain a protracted war will win the war. (Emphasis added).
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AFMIS: AUTOMATING SUBSISTENCE MANAGEMENT

SFC DELONA FRANCIS

The Army Food Management Information System (AFMIS) is in its last stage of testing before final approval and fielding. A Systems Acceptance Test (SAT) was run between 7 June and 8 July 1988. The SAT was conducted in three dining facilities at Fort Lee, Virginia as well as at the Installation Food Advisors (IFA) Office, the Troop Issue Subsistence Activity (TISA) and warehouses.

AFMIS is designed to relieve food service and subsistence supply personnel of much of their administrative burden. It does this by computerizing many functions previously performed manually.

The time gained by Food Service Managers using AFMIS can then be used for training and quality control activities. AFMIS will also improve management controls and responsiveness by providing more efficient accounting and reporting capabilities.

By 1991, the AFMIS will be operational at Army installations within CONUS. Initial fielding will consist of the following modules:

- **Dining Facilities Operations (DFO)**—The DFO module will be located at dining facilities. It performs six functions:

1. Ration/Issue Cycle Planning
2. Meal Production Planning
3. Inventory Management
4. Dining Facility Inquiries
5. DFO Head Count
6. Batch Process of ration requests

These functions allow the dining facility manager to create and adjust menus, create production schedules, maintain inventory accountability, perform head count entry, and produce ration requests.

- **Troop Issue Subsistence Activity (TISA)**—The TISA module is a program which provides a subsistence accountability for a TISAs procurement, receipt, issue, sales, inventory, and reorder functions. This module is fully integrated with other AFMIS modules and is capable of ensuring that all

authorized customers receive responsive subsistence support.

- **Installation Food Advisor (IFA)**—The IFA module will provide an integrated system of communication between the DFOs and the TISAs. This module will provide the Food Advisor with reports of various DFO operations, as well as an overview of all items and prices in the TISA supply system. It also offers a review of the current status of the dining facility account and performs file maintenance for the Master Menu.

The initial fielding of AFMIS is scheduled to begin March 1989. The Military District of Washington will receive the first issue of AFMIS modules, followed by FORSCOM installations. Korea, AMC, TRADOC and USAREUR will follow.

The Quartermaster School plans to start integrating AFMIS into its subsistence and food service courses at the same time that fielding begins. It will be incorporated in the POIs for all levels of 94B instruction, all levels of 76X (Subsistence Storage Specialist), and into the Officer Basic and Advanced Courses. A computer tutorial, much like that accompanying commercial software will be included with the AFMIS modules when they are fielded.

Production History of 240th QM Battalion Dining Facility, Fort Lee, Va. is posted on AFMIS.



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ACTIVATING THE 54TH GRREG COMPANY

CPT BETHEL

A short year after the establishment of the U.S. Army Graves Registration Center (GRREG) another step towards revitalizing the program of caring for and handling the dead in the theater of operations took place when the 54th Quartermaster Company (Graves Registration) was activated. On 5 December 1988, at Fort Lee, Virginia the 54th became the first active duty Graves Registration (GR) Company in the Army since 1962.

The mission of the 54th is to search for, recover, and identify the dead; evacuate remains; or if necessary on the field of battle, temporarily inter them. Responsibility for the processing of personal effects and maintaining essential records and report pertaining to deceased personnel are among the 54th's other responsibilities.

Comprised of a headquarters element and two cemetery/evacuation platoons, the 54th also has the capability to establish, operate and maintain two temporary cemeteries. Secondly, the 54th has a mission to respond to military mass fatality disaster events worldwide and assist in civilian disasters whenever Department of Defense (DOD) support has been requested.

Prior to the activation of the 54th, the Army's only GRREG companies were assigned to Reserve and Component units. The need for an active company had long been voiced, but became undeniable following the air crash that occurred in Gander, Newfoundland in 1985.

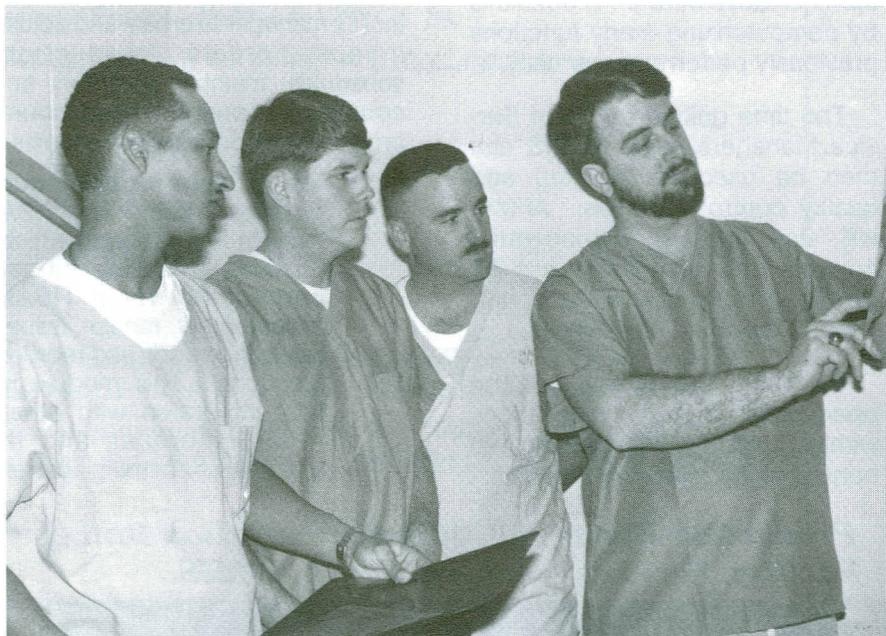
Two hundred fifty-six persons, including 248 soldiers of the 101st Airborne Division were killed in that accident. At that time, a 17 person graves registration team composed of personnel from all over the world was assembled at Fort Lee, then deployed to Newfoundland. The requirement for a quick-reaction, im-

mediately deployable GR support unit was noted. That requirement has now been met, and the 54th stands readily to deploy worldwide in response to disaster or conflict.

The 54th is authorized 80 personnel, of which 55 are Graves Registration specialists (57F). Construction equipment operators, carpentry/masonry specialists, a construction supervisor, technical draftsmen and a trumpet player are

sought from other units worldwide. Many of those soldiers reenlisted specifically for the 54th.

Graves registration is often an emotionally, physically and spiritually trying mission. In order to be optimally prepared, the 54th focuses on the training of its members. The company cadre provides continuing instruction in 57F skills, building on the foundation offered by Advanced Individual Training.



*Members of the 54th Gr. Company
augment their training at the
Virginia Medical Examiner's morgue.*

also found in this unique company. With the exception of the trumpet player whose duty would be to play at funeral ceremonies, these members of the 54th would be responsible for the actual construction and excavation of a temporary cemetery. In order to establish the 54th as a ready-to-deploy company, experienced GR personnel were

An important part of the ongoing training involves acclimating the 57Fs, particularly the less experienced members of the 54th, to the sights and smells that are part of the catastrophic nature of battlefield casualties. There is often a flinch factor that stems from the shock of dealing with casualties of conflicts or disaster. In order to reduce that

shock, the 57Fs must know what they can expect to find when called to such a site. To accomplish this familiarization, soldiers of the 54th are rotated through the Virginia medical examiners morgue (in Richmond, Virginia), where they assist in identification and autopsy tasks. Members of the 54th also hone their GR skills by training in dental identification at Bull Dental Clinic at Fort Lee, and by taking courses (on their own) in mortuary science at a local college. In preparation for civil disasters, the 54th plans to work with the FBI at Quantico, Virginia.

This summer, the new unit will travel to Ramey, Puerto Rico and pass those skills along when they conduct annual training for GR reservists from the 246th QM Battalion.

Until recently, two additional active duty GR companies were scheduled for activation in 1990 as part of the Quartermaster Force Im-

provement Plan. Those activations have been postponed till 1998, pending further review. As such, the 54th will remain the sole active GR company in the Army inventory for quite some time.

With this in mind, it becomes even more important to emphasize that initial GR responsibility belongs to individual units. During conflict, unit leaders will be called on to perform the first search and recovery, as well as evacuation and identification of their deceased personnel. It is a misconception to think GRREG personnel will handle each casualty related situation on the battlefield.

Graves Registration has never been an easy job. As weapons become increasingly more lethal, as the damage they cause becomes more traumatic, the GR mission becomes ever more difficult. The GRREG soldier must be particularly motivated and concerned to carry it out; singularly prepared

both as an individual and as a unit member to deal effectively and respectfully with the ultimate horrors of conflict or catastrophe.

When war started in Korea, and later in Vietnam, those preparations had not been made. By activating the 54th QM Co (GR) the Army has taken another step towards assuring that the assets required to handle its dead are in place, ready to respond quickly, effectively, respectfully.

CPT Darnell J. Bethel is the Commander, 54th Quartermaster Company (Graves Registration), 240th Quartermaster Battalion, U.S. Army Quartermaster Center and School (PROV), Fort Lee, Virginia.

Think SMART!

CW3 MICHAEL R. MENEFEE

Frustrated by a system that just doesn't work, particularly when there seems to be such an easy way to fix it? The Supply and Maintenance Assessment and Review Team (SMART) is waiting to hear your solution to problematic situations in hopes of making the fix. How does SMART work? The following scenario is typical.

IG findings have provided significant evidence that many warehouses and units are having difficulty maintaining DA Form 1687, the Delegation of Authority

Card. Much of the problem stems from the fact that the number of personnel available to maintain these cards is being reduced. As a result, soldiers are often sent to pick up supplies and only to be turned away because of an outdated or misfiled signature card. Now what?

This common problem was countered by an uncommon response. A Quartermaster Officer from the 24th Infantry Division (Mech) decided that a simpler, more effective method of dealing with Delegation of Authority was

called for, and proposed a solution. His idea: replace DA Form 1687 with a controlled delegation of authority card, about the same size as a meal card. To establish the card, a new commander would simply provide a copy of his or her orders, and the assumption of command DF. After the card was issued, the new commander would furnish the cards serial number to the activity requiring the delegation of authority.

This card would be controlled by the commander or the commanders representatives and signed out as required to meet the mission. Updating the card would only be required upon a change of command or loss of a card. At that point, the old serial number would be rescinded, and a new card serial number submitted.

Simple enough? Effective? The SMART team thought so, and this solution was adopted by the Logistics Evaluation Agency (LEA) and the U.S. Army Quartermaster School (QMS) for Armywide implementation. In January 1990, use of the new delegation of authority card and procedures are scheduled for publication in Supply UPDATE #13.

All soldiers need an avenue to get ideas for logistics related improvements into the hands of policy makers. As logisticians, we are charged with the responsibility for improving and streamlining our methods of operation to meet current field requirements. To accommodate these needs, the Department of Army Deputy Chief of Staff for Logistics (DCSLOG) directed that a concept be developed to solicit "grass roots" solutions from the field to answer logistical problems. In 1982,

**Note: Test Sample
Actual card may or may not
be in the same format**

FRONT

NOTICE OF DELEGATION OF AUTHORITY - RECEIPT FOR SUPPLIES	
ORGANIZATION, INSTALLATION	DODAAC
THE BEARER OF THIS CARD IS AUTHORIZED TO RECEIPT FOR SUPPLIES FROM THE ACTIVITY CHECKED ON THE REVERSE SIDE OF THIS FORM. THIS CARD IS ACCOUNTABLE IT'S LOSS WILL BE REPORTED TO THE AGENCY CHECKED ON THE REVERSE AND A NEW CARD WILL BE ISSUED.	CARD SERIAL # A94450097
UNIT COMMANDERS SIGNATURE BLOCK/SIGNATURE	
DA FORM --- TEST	

BACK

AUTHORIZED FACILITIES			
	CLASS I/TISA		CAN POINT
	CLASS II/IV WHSE		AG PUBLICATIONS
	SSSC		DIRECT SUPPORT MAINT
	DEH WHSE		DOL MAINT (INSTAL)
	CLASS III		QM LAUNDRY
	CLASS (DAO)		DEH SELF HELP
	ASP		TASC
	CLASS VIII WHSE		PROP DISPOS OFF(DRMO)
	CLASS VII PT		
	CLASS IX		

through the efforts of the DCSLOG, the U.S. Army Logistics Center (USALOGC), the U.S. Army Materiel Command (AMC), and the 24th Infantry Division (Mech) this concept became Project SMART.

The SMART team specifically seeks logistics improvement ideas from all levels of the Army, military and civilian. Operating on the idea that "who knows better what will work than the person trying to make it work" has been fruitful for SMART. After receiving suggestions, SMART coordinates with the proponent agency to validate those improvements for possible Armywide implementation. Program savings of over \$130 million dollars have been realized by listening to the 'folks in the know'. Through SMART project, the average adoption rate for evaluated ideas has been over 10%.

Supply and Maintenance Assessment and Review Team suggestions made by Quartermasters caused the creation of a study group which developed what be-

came the Unit Level Logistics System (ULLS). Other accomplishments include the rescision of AR 700-98 (M.A.D. Report), numerous changes to AR 710-2 and associated DA Pams which affected serial number management, property accountability for fabricated equipment and handtools, and the elimination of unneeded forms. The soldiers who submitted these suggestions didnt just point out problems, they told SMART how they could be reduced or eliminated.

Key Army logisticians and influential tacticians provide the support, guidance, and direction to ensure that SMART maintains an 'open door'. A council of general officers oversees the SMART program to assist in removing roadblocks to quickly implement validated improvements.

The USALOGC, the TRADOC Executive Agent for SMART, is a key organization for this innovative project. Not only is the USALOGC the focal point for idea submission,

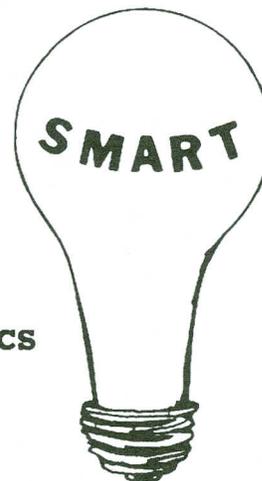
it also provides life cycle management for each idea.

Do you have an idea that will make a system, procedure, or other situation more workable? If so - let us know, by sending us a statement of the full problem including references to the publication or equipment involved, and a recommended solution. Although not required, you may use DA Form 553 to submit an idea. (DA Form 553 is available from your local AG Publications Office.)

Be part of this winning program; mail your SMART idea to: Project SMART, U.S. Army Logistics Center, ATTN: ATCL-CFI-S, Fort Lee, VA 23801-6000. Your idea may just be the solution needed for todays Army.

CW3 Michael R. Menefee is the Logistics Officer/Supply Analyst for Project SMART, U.S. Army Logistics Center, Fort Lee, Virginia.

- Question traditional procedures
- Identify complicated procedures
- Challenge unnecessary rules
- Streamline and improve logistics
- Assist in performing mission
- Recommend changes



SEND YOUR IMPROVEMENTS TO
PROJECT SMART
USA LOGISTICS CENTER
FORT LEE, VA 23801-6000
An Idea Whose Time Has Come

Logistics is in the making.

Be part of it.

U.S. Army Troop Support Agency SERVES THE MOST DESERVING

DEBORAH FIELDS

Psychologist Abraham Maslow tells us that first in man's hierarchy of needs are the basic physical ones. These needs must be met before man can consider other goals. It is the needs for food and clothing that the U.S. Army Troop Support Agency (TSA) strives to meet for soldiers and their families, enabling them to serve our country at military installations around the world. "While the Troop Support Agency's mission encompasses a diverse array of responsibilities, our focus is on one thing--improved services and support to soldiers and their families," said Brigadier General James S. Hayes, who commands TSA. "Since our activation in 1972, we have made great progress in each of the functional areas of our responsibilities. The number of line items and operating hours have been increased in our commissaries, and an across-the-board increase in efficiency and an improvement in our facilities has occurred."

The Troop Support Agency, under the direction of the Department of the Army Deputy Chief of Staff for Logistics (DCSLOG), manages and operates commissaries worldwide. While this consumes a great deal of TSA's corporate energy, it is by no means its only function; TSA provides technical guidance and procedures for operation of the Army's garrison food service, troop issue subsistence, laundry and dry cleaning, field laundry and bath activities, clothing sales stores, central issue facilities and clothing initial issue points. The Agency works with other activities and agencies concerned with doctrine, education and training related to troop support functions for the active Army and Reserve Components.

THE ARMY COMMISSARY SYSTEM

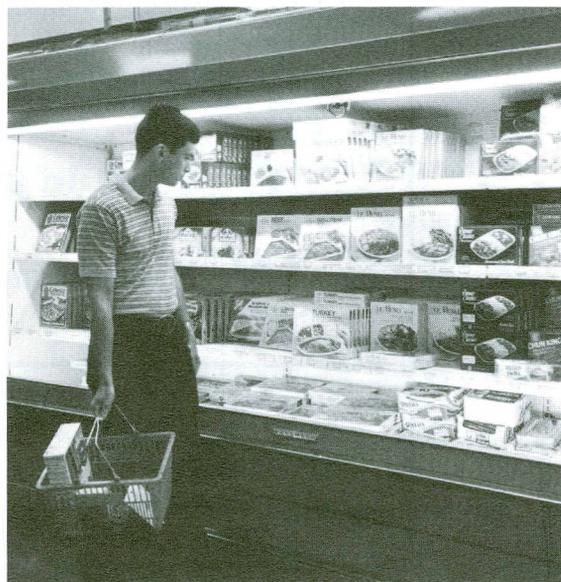
Troop Support Agency manages the Army Commissary System through its five commissary regions. Four of these regions are in the continental United States: The Northeast Commissary Region, headquartered at Fort Meade, Maryland; the Southeast Commissary Region which includes Puerto Rico, headquartered at Fort Lee, Virginia; the Midwest commissary Region which includes Panama, headquartered at Fort Sam Houston, Texas; and the Western Commissary Region which includes Alaska, Hawaii, Japan and Korea, headquartered at Fort Lewis, Washington. The European Commissary Region (EURCOR) is headquartered in Zweibruecken, West Germany.

The European Commissary Region is the largest region both in the number of commissaries and in total area. It includes commissaries located in Germany, the Netherlands, Belgium, Italy, Egypt and Saudi Arabia. The European Commissary Region is divided into six districts, each overseeing approximately 14 commissary operations.

*At Camp Zama,
Japan the
U.S. Army
Commissary
provides familiar
food items*

Management of commissary operations is accomplished through cooperative efforts of TSA Headquarters, the regions, districts and the commissaries themselves. Troop Support Headquarters provides overall direction in the form of planning, programming, merchandising and doctrine. The regional headquarters and European districts provide specific direction relating to accountability and compliance with agency policies. The commissary officer is responsible for the day-to-day operation of the facility, ensuring that quality service is provided to the military community.

The Army Commissary System provides two major benefits to the soldier and this family. For the soldier serving Outside of the Continental United States (OCONUS), the commissary provides a means of acquiring familiar food items at affordable prices. The second and perhaps the most appreciated benefit is the approximate 25 percent that customers save by shopping at commissaries rather than at commercial supermarkets. In order to provide these savings, commissaries sell goods at cost plus a five-percent surcharge;



shoppers are not required to pay a tax on their purchases. The surcharge fund is used for commissary construction, Continental United States utilities, automated data processing equipment, supplies, maintenance and services. Surcharge is never used to pay employees' salaries.

GARRISON FOOD SERVICE CENTER FOR EXCELLENCE

Troop Support Agency's second area of involvement in meeting the needs of soldiers also concerns nourishment. The Agency serves as the center of excellence for the Army's garrison food service operations. In this role, TSA provides the Army representative for several DOD food committees. The Director of Food Service serves as chairman of the Armed Forces Product Evaluation Committee and the Armed Forces Menu Service Committee. The Agency also provides the voting member to these two committees, plus the voting member on the Armed Forces Recipe Service, the Armed Forces Consumer Level Subsistence Appraisal, as well as the New Food Item Committees.

The TSA is involved in modernization and construction of new dining facilities and troop issue subsistence activity facilities through the validation of each project and participation in the DOD Food Service Facilities and Equipment Planning Board.

The TSA develops the monthly master menus used in all Army dining facilities. Emphasis on nutrition and fitness programs has led to the development of lower calorie meals which are now incorporated into these menus. Army menu planners have developed master menus that assist soldiers in reducing consumption of total fat, saturated fat and sodium. Calories derived from fat in the 1989 menu

average 35 percent of total calories and the menu complies with Office of the Surgeon General guideline of 1,400-1,700 milligrams of sodium per 1,000 calories.

Each year, Food Management Assistance Teams (FMAT) from TSA visit approximately 80 installations and 800 dining facilities around the world. Food Management Assistance Teams assist food service sergeants and dining facility managers by reviewing their food service operations and suggesting improvements. The Troop Support Agency sponsors a biennial Department of the Army Worldwide Food Service Conference designed to address common food service and military issues, develop courses of action for resolution of problems and chart the course for future accomplishments. One of the major objectives of the conference is the development of avenues for bringing the active component and reserve component forces closer to being one total force.

Troop Issue Subsistence assistance is also provided worldwide. Observers are set to major field training exercises and provide management assistance to MACOMS and installations for all troop issue subsistence functions. Troop Support Agency hosts a Department of the Army (DA) worldwide Troop Issue Subsistence Activity (TISA) workshop held biennially at Fort Lee. Participants are briefed on programs underway, areas affecting current TISA operations and are informed of coming changes.

One of the most visible aspects of our food service area is the Connelly Awards Program. Connelly recognizes the best Army dining facilities and food service operations around the world. The International Food Service Executives Association co-sponsors this competition and assists in its evaluation.

CLOTHING AND SERVICES

The Troop Support Agency helps to meet the clothing needs of soldiers through several means. The Agency provides operating procedures, guidance and on-site assistance for these Armywide logistics programs:

**Clothing Initial Issue Points,
Clothing Sales Stores,
Central Issue Facilities,
Laundry and dry cleaning
plants and
Field laundry and bath.**

With one exception, these functions belong to the installations and MACOMS, and their resources are used to support them. The exception is TSA's role in funding military clothing sales store operations. Except for this, TSA has no command or control responsibility in the clothing and services area.

Clothing Initial Issue Points are where new soldiers get their first set of clothing following induction. Representatives from the Directorate of Clothing and Services make periodic visits to the activities to provide assistance in management procedures and ensure compliance with established policies and procedures. The Army has a total of eight initial issue points that process approximately 120 million dollars worth of clothing annually.

Clothing Sales Stores sell replacement clothing. They are operated by the Army and Air Force Exchange Service under a Memorandum of Understanding (MOU). The Troop Support Agency acts as administrator of this agreement with the objective of making sure the soldier is well served. The Troop Support Agency also manages the stock fund and Operations and Maintenance, Army resources used to support these stores.

Central Issue Facilities maintain an inventory of organizational clothing and individual equipment such as sleeping bags, tents and cold weather boots. These items are issued to soldiers when they join units and are turned in when they leave. The Troop Support Agency assists in developing the policy and procedures for operation of these facilities and conducts management assistance visits to assure compliance and provide assistance.

Laundries and dry cleaning plants are fixed facilities located at most major installations, both in CONUS and overseas. These facilities support installation activities, Army hospitals and clinics and soldiers. Among other functions, TSA evaluates contractor-operated plants, conducts periodic visits to Army-operated activities and reviews budget estimates for the entire Army Laundry and Dry Cleaning Program.

Field laundry and field bath activities, which are TOE units, belong to Active Army and Reserve Components. Again, TSA develops and

recommends policy for the Army field laundry and bath programs, manages a technical assistance program for these operations and advises higher headquarters to ensure that timely changes are made in organizational and logistical support.

HISTORICAL HIGHLIGHTS

The Troop Support Agency or its precursors have been taking care of soldiers' needs since 1957 when the Army Subsistence Center was established in Chicago. One year later it was designated the U.S. Army Subsistence Center and became a major subordinate command of the Office of the Quartermaster General. In 1962, The Subsistence Center became an activity of the Chief of Support Services, Department of the Army.

The Center changes its title to the U.S. Army Food Service Center in 1966. In 1971, it was made a field operating agency, Office of the Deputy Chief of Staff for Logistics, Headquarters, Department of the Army, and moved from Chicago to Fort Lee. The Food Service Center

acquired additional responsibilities and was renamed the U.S. Army Troop Support Agency in 1972. In October 1975, TSA was designated the central management agency for Army commissaries.

"Our assistance, whether in terms of management or technical aid and sometimes funds, has assisted commanders worldwide with improved food service, troop issue subsistence, clothing sales and issue, garrison laundry and dry cleaning and field laundry and bath operations. While much has been done, even more remains to be accomplished as we figure out how to maintain quality, high level service and support in an era of constrained resources," Hayes concluded.

Deborah Fields is the Editor, Troop Support Digest, U.S. Army Troop Support Agency, Fort Lee, Virginia.

REFLECTING THE PRIDE OF THE CORPS:

THE QUARtermaster HALL OF FAME

In November 1985, QMCENFL Pam 11-1 established the Quartermaster Hall of Fame. Brought to being under the guidance of then Quartermaster General Major General Eugene L. Stillions, the Hall of Fame recognizes outstanding leaders who have made major contributions to the mission of the Quartermaster Corps. The first four inductions to the Hall of Fame were made in 1986. Since then the ranks of the Hall of Fames members have grown to number ten.

Nominations to the Hall of Fame can be submitted by any individual at any time. Persons eligible for nomination include retired or deceased personnel of any military rank, or civilians who have made significant contributions to the Quartermaster Corps mission. Nominees primary careers must have been in the Quartermaster Corps, or in Quartermaster related fields. To be considered for induction in the current year, nominations must be made no later than October 1 of the preceding year. Nominations will be reviewed by the Chief, Office of the Quartermaster General and additional research on nominees conducted as necessary before nominations are forwarded to the Hall of Fame Selection Board.

The selection board consists of six primary and three alternate members and is appointed by the Quartermaster General. It serves to review all nominations, then forwards its recommendations to the Quartermaster General for approval. Normally, not less than one, nor more than three individuals will be chosen for induction per year. Official announcement of selectees will be made at the induction ceremony each year. The induction ceremony usually takes place as part of the General Officers Conference. At that time inductees, or their proxy, will be presented a Quartermaster Hall of Fame medalion. Inductees will be further honored by the unveiling of a permanent display. That display, housed in the Quartermaster museum will include each inductees name, their photograph, and a narrative of their major achievements.

Persons desiring to make a nomination should forward pertinent information to include the nominee's name, rank/grade (if applicable), date and place of birth, date deceased (if applicable) and address. Also included in the nomination packet should be information about the nominee's :

- publications/ contributions to periodicals (if applicable and relevant; include dates.)
- significant citations and awards (military and civilian)
- significant assignments/duty positions (include dates)
- education (military and civilian, including periods of attendance and degrees earned)
- a list of possible sources of information about the nominee

Major contributions to the U.S. Army Quartermaster Corps should also be enumerated and an 8 x 10 photograph should accompany the packet.

The Office of the Quartermaster General welcomes submissions to the Hall of Fame, but wishes to underscore the fact that nominations should reflect major contributions to the Corps during its 200 year history. Only individuals with the most notable achievements or distinguished careers will find a place of honor in the Hall of Fame. Individual wishing to make additional inquiries should contact the Office of the Quartermaster historian, AUTOVON 687-5951. Nominations should be forwarded to:

Chief, Office of the Quartermaster General
ATTN: ATSM-ACZ
Fort Lee, Virginia 23801-5032

The Spring 1989 edition marks the first anniversary of the Quartermaster Professional Bulletin. It's been a full year- having been voiceless for so long, the Corps had a lot to say about and to each other. The index below references what they had to say; the articles published in the first four issues are listed for your convenience. Having reviewed the list, the staff would once more like to thank all of those who submitted articles to the Bulletin. Your support, and above all, your professionalism is what makes the the Quartermaster Professional Bulletin a reality.

The Quartermaster Professional Bulletin is looking forward to serving the Corps in the years to come by providing a vehicle for the exchange of information, ideas and dialogue pertinent to the Quartermaster mission. Only your input and support will make that possible. If there's a topic you would like to see addressed in a future issue, or if you would care to comment on an article that has appeared on our pages, please contact us by calling Autovon 687-4741/4382, Commercial 804-734-4741/4382, or by writing to:

EDITOR
The Quartermaster Professional Bulletin
ATTN: ATSM-ACZ-PB
FORT LEE, VIRGINIA 23801-5032

We've made a good start- help us to maintain our momentum and to ensure the quality of your publication as we move into our second year. – Editor

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WATER CONSUMPTION PLANNING FACTORS

The water consumption planning factors study, originally developed by the Quartermaster School at the request of the Logistics Center in 1983, has been updated to reflect changes in water usage over the past five years. The purpose of the study is to provide water consumption planning factors for various uses (drinking, field feeding, medical treatment, etc.) for tactical and force structure planning. Data for the study was collected from other TRADOC schools and selected medical agencies. This data was analyzed and two types of factors were developed: those which relate directly to the number of soldiers in the theater and those which are independent of the force structure.

The revised study was approved by the HQDA, Office of the Deputy Chief of Staff for Logistics, Water Office on 26 Oct 88 and was distributed to logistics planners in all major field commands, divisions, and support commands in the Active and Reserve Components. Revised water consumption planning factors for each environmental region and level of command (battalion through corps) are presently being staffed to HQDA through the Logistics Center. Upon approval, these factors will be distributed to the same organizations which received the study.

TACTICAL ICE-MAKING MACHINE

The Tactical Ice-making machine (TIM) will produce potable ice for use in the Army Field Feeding System (AFFS) and for distribution to medical units. It will be operated by water purification specialists (MOS 77W) and be collocated at the water point. Each machine should produce sufficient ice to supply the daily needs of a brigade or equivalent-size unit.

Based upon preliminary surveys, the TIM could be acquired as a nondevelopmental item. Type classification is scheduled for 4QFY 91 and fielding is due to begin during 2QFY92.

REVERSE OSMOSIS WATER PURIFICATION UNIT (ROWPU) 3,000 GPH

The 3,000 GPH ROWPU will be the purifier for Corps and Echelon above Corps units. It will be capable of producing potable water from fresh, salt, brackish, and NBC contaminated sources. The unit was type classified standard on 29 Jul 87 and is currently under production. First article testing is scheduled for 3QFY89, and fielding to Quartermaster Direct Support Companies and General Support Water Purification Units is expected to begin during 3QFY90.

FREEZE PROTECTION FOR WATER SUPPORT EQUIPMENT

Water purification, storage, and distribution equipment will be deployed and used in all climatic environments. Because water freezes at 32 degrees fahrenheit, the equipment also must be protected from freezing. Initiatives to protect water support operations in cold regions are underway with efforts being performed in three phases. The first is the development of a set, kit and outfit (SKO) to protect the 600-gallon per hour Reverse Osmosis Water Purification Unit (ROWPU) while in operation. This SKO will consist of shelters, heaters, etc., already in the Army's inventory. The second phase will deal with preventing freezing of the ROWPU while in transit. Efforts are aimed at an antifreeze type additive that could be flushed through the unit prior to movement. The final phase will concentrate on freeze protection of water distribution equipment.

COLLECTIVE FRONT-END ANALYSIS ON WATER SUPPLY UNITS

Allen Corporation has started Collective Front-End Analysis on Quartermaster (QM) Water Supply units. This analysis will be used in developing the ARTEP Mission Training Plans (MTPs) for the QM Water Supply Battalion, QM Water Supply Company and QM Water Purification Teams. The projected date of availability for these publications is 4Q FY 90.

SUPPLY

SUPPLY TRAINING FACILITY

On 27 Jul 88, the Supply Department received the keys for a newly constructed training facility located at the corner of A Avenue and 16th Street, Fort Lee, Virginia. This facility, which has been in the planning/construction stage for over six years, contains more than 105,000 square feet of training space. The two-story complex is configured in a rectangular shape with a center courtyard, and is currently being used to train all 76C students and some 76Y students. It contains a 346 seat auditorium, 29 training laboratories, a weapons vault, and office space to accommodate the headquarters staff of the 76C and 76Y training divisions that occupy the facility.

The new training building replaces structures that were built during World War II and the Korean conflict time era. The old facilities were not equipped with environmental control equipment, and they were cold in winter and hot in the summer. The new facility has greatly improved not only the classroom appearance, but the morale and attitudes of both instructors and students as well. This provides for a better learning environment and it is felt that a more qualified graduate is provided to the gaining commands.

INTEGRATED TRAINING

In an effort to better train soldiers, the Materiel Control Training Division has instituted Integrated Training within the MOS 76P (skill level 1, 2, 3, and 4) in direct contact with soldiers in MOS 76C, 76V, and 76Y MOS by means of a simulated Direct Support Unit (DSU).

Soldiers in MOS 76P assume various duty positions within the simulated DSU and actually process documents prepared by soldiers in MOS 76C and 76Y, as in the cases of actual assignments and/or jobs. As documents are processed, output is created for MOS 76V personnel that in turn generates issues to the customer.

The goal of this 40 hour training exercise is to produce a more qualified soldier with an increased insight of job related responsibilities and expectations.

AUTOMATION FOR THE 76V ADVANCED INDIVIDUAL TRAINING (AIT) SOLDIERS

Since January 1989, the Storage Training Division, Supply Department, Fort Lee, Virginia has been training the 76V Advanced Individual Training (AIT) soldiers on automated supply procedures. The soldier receives 65 hours of training on the Tactical Army Combat computer System (TACCS), Standard Army Retail Supply System (SARSS) Software, and the Logistics Applications Automated Marking and Reading Symbols Tactical (LOGMARS-T). The soldier also receives an introduction to the relationship of Army supply systems, concept of operation, function of these systems, and other necessary skills for successfully processing items of supply support.

SUPPLY EXCELLENCE AWARD

The U.S. Army Quartermaster School (QMS) is currently evaluating units for the FY 89 Chief of Staff, Army, Supply Excellence Award. United States Army QMS evaluators began visiting nominated units in February of this year. The number of entries for this year's competition is the largest in the history of the program. This increase in participation is due to strong support received from all of the MACOMs. Headquarters, Department of the Army will announce winners and runners-up, 4QFY89, upon completion of the evaluation.

SUBSISTENCE

SURCHARGE COLLECTIONS IN TSA COMMISSARIES RISE

Surcharge fund collections in U.S. Army Troop Support Agency (TSA) commissaries rose by approximately \$4 million for a total of \$89.5 million in fiscal 1988. Each of the agency's five commissary regions reported increases above fiscal 1987, TSA officials report.

Leading the increase was TSA's European Commissary Region (EURCOR). It reported a rise of 8.41 percent in surcharge fund collections in the recently completed fiscal year. The increased collections in EURCOR were attributed to the weakened dollar abroad. That situation has encouraged more purchases in TSA commissaries and less on European economies.

The surcharge a customer pays benefits all shoppers because it pays for new construction, improvements to existing facilities, utilities such as: electricity, heat, refrigeration, air conditioning and telephones for commissaries in the United States.

Additionally, this money is used for the purchase of automated data processing equipment, electronic cash registers, scanning systems, forklifts, display cases, meat processing tables and other equipment; supplies such as: shelf labels, cash register tape, safety glasses, shopping carts; and maintenance and services such as: equipment repair, laundry of uniforms and cleaning supplies. Surcharge also pays for damaged and stolen merchandise.

COMMZ

What is a COMMZ? Can it be eaten, where does it fit? The correct answer is none of the above. The COMMZ is an acronym for Communication Zone. As used at Natick it represents a food service system devised to support hospitals in a battlefield area known as the Communication Zone.

The Navy has a mission to provide close by hospital support for Marine Amphibious Assault Forces. These hospitals need a food service system capable of feeding 500 patients and a staff of approximately 1000, using the Hospital B Ration.

Natick's Food Engineering Director has designed a food service system to make use of previously developed fuel fired field hardware, and do it on minimum electrical power. It has to be housed in shelters and containers currently in the Navy's Fleet Hospital inventory. This means the standard family of shelters developed at U.S. Army Natick Research, Development and Engineering Center's Aero Mechanical Engineering Directorate.

The system consists of a kitchen, bakery, sanitizer elements, each housed in its own container shelter. It must provide full food service capability for grilling, baking, roasting, rehydrating B Rations, boiling and pressure cooking plus pastry baking and a facility to wash and sanitize dinnerware.

The first unit was completed in September and delivered to Camp Pendleton, California for evaluation and training purposes. Current plans call for a preliminary data package to be completed by December 1988, and finalized by September 1989.

T-RATION SUBSTITUTIONS

In the past the substitution of entree items in the T-Ration menu caused many problems in the field i.e., lasagna for breakfast. A new policy, designed to eradicate this problem has been implemented: when the main menu is not available, it will not be substituted. This may cause a particular menu to go to a not-in-stock condition. Other items within the menu may be substituted with like items to keep a menu in the supply pipeline. For example, white rice may be substituted for spanish rice. Actual menu items received in a T-Ration module will be listed on the packing list posted on the side of each T-Ration module.

AFFS UPDATE BRIEFED TO ACTIVE DIVISIONS

Quartermaster School representatives briefed Active Army divisions in CONUS, Korea, and USAREUR on proposed changes to the Army Field Feeding System. Following the briefing, division personnel had an opportunity to voice their concerns and formulate a position on each of the proposed changes. Most of the Army divisions have converted to the Army Field Feeding System. The proposed changes centered around adding some cooks back to the divisions to give them a capability to serve an occasional A-Ration meal each week, adding the kitchen, company level to heavy divisions, and reducing the number of designated feeder units by giving more units their own cooks, especially in the light divisions. The results of these proposals will be briefed to the Army leadership during March 1989.

AFMIS

The Army Food Management Information System (AFMIS) is scheduled to be fielded during the 2d Qtr, FY 89. The Army Food Management Information System will automate head count procedures in garrison dining facilities and process routine functions in troop issue subsistence activities. The Quartermaster School is scheduled to begin training for food service personnel sometime during the March-April 1989 time frame.

AFFS FIELD ACCOUNTING PROCEDURES

New Army Field Feeding accounting procedures are now being staffed with the MACOMS. The new procedures will be in the form of a regulation covering both field kitchen and supply procedures.

GRAVES REGISTRATION

FM 10-63 HANDLING DECEASED PERSONNEL IN A THEATER OF OPERATIONS

FM 10-63 is under major revision and is scheduled for fielding in the 1st Qtr FY 90. The revision will be a consolidation of FM 10-63-1. Graves Registration (GRREG) Handbook and FM-63. It will contain a section for NON-GRREG trained personnel and one for 57F MOS trained personnel. The manual will continue to be a multi-service publication.

GRAVES REGISTRATION COMPANY ACTIVATED

The only active component Graves Registration (GRREG) Company in the Army forces structure was activated at Fort Lee, Virginia on 5 December 1988. The 54th Quartermaster Company (GRREG) TOE 10-297 has the mission to provide search and recovery, collection point, and temporary cemetery operations in the Corps or Theater Army areas. Additionally, the 54th is being trained and equipped to be a worldwide disaster response unit in support of mass fatality events.

DISASTER AND BATTLEFIELD TRAINING SITE

The outdoor training area for Graves Registration Specialist has been renovated at the Quartermaster School and is being used for active and reserve component disaster and battlefield training. The area provides excellent opportunities for search and recovery, collection point, temporary cemetery and mass burial operations training. Several vehicles, a helicopter and tactical fighter jet, and mannequins complete with equipment and personal effects, are available for use in the training.

GRREG TRAINING PRODUCTS AVAILABLE

There are nine GRREG audiovisual products available for training purposes. They may be obtained from your local Training and Audiovisual Support Center (TASC). The last three may be obtained by contacting the Quartermaster School Graves Registration Center, ATSM-GR, Fort Lee, VA 23801.

TITLE	NUMBER	TIME
Memorial Activities, Part I - Combat Search and Recovery	TF 10-4697	28:00
Memorial Activities, Part II - Identification	TF 10-4052	25:00
Memorial Activities, Part III - Concurrent Return Program	TF 10-4158	22:00
Memorial Activities, Part IV - Escorting Deceased Personnel	TF 10-4161	28:00
Memorial Activities, Part V - Disposition of Personal Effects	TF 10-4159	17:00
Memorial Activities, Part VI - Cemetery Operations	TF 10-4694	42:00
Legible Prints	492-101-0166-B	06:00
Skeletal System	492-101-0166-B	11:56
Dental Structure	492-101-0190-B	06:00

RESERVE COMPONENT OFFICER ADVANCED COURSE

The FY 89 training schedule for the reconfigured three phase Reserve Component Officer Advanced Course (RC OAC) is currently being reviewed by the Quartermaster School. The tentative schedule for the RC OAC follows:

Class 89-3 - Phase I - CCM - 18 June - 1 July 1989

Class 89-1 - Phase III - Quartermaster Common Core - 13-26 August 1989

The Reserve forces school will concurrently instruct Phase II and IV of the current four phase RC OAC during 4-16 June 1989 and 23 July - 4 August 1989.

RESERVE COMPONENT SUPPORT PROGRAM

The Reserve Component Support Program (RCSP) was implemented in September 1988 and supersedes the Reserve Component Improvement Plan. The RCSP supports the Quartermaster (QM) School long range goals with emphasis on training. These are the building blocks necessary to support the foundation for achieving a self motivated soldier and a highly effective QM unit. The program will be ongoing and provides the focal point for the RC Strategy for the Future. The program will enhance the QM School training products and support to our Reserve Component counterparts.

SWAPDOP MODULE AT FORT PICKETT, VIRGINIA

A Southwest Asia Petroleum Distribution Operational Project (SWAPDOP) training module is being set up at Fort Pickett, VA for use by active and reserve petroleum pipeline, terminal operating and engineer pipeline construction units. The SWAPDOP module consists of 1,200 miles of pipeline, 66 pumping stations, (two 800 gpm pumps per station), 24 Tactical Petroleum Terminals (TPT), and an unspecified number of suspension bridges. It will be used to prepare for Southwest Asia mission.

The SWAPDOP module, to be assembled in April 1989, will be the only training module available for units. The Quartermaster School at Fort Lee, VA will provide individual training.

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ROTC AFFILIATION PROGRAM

In the summer of 1984, the Deputy Chief of Staff for Reserve Officers Training Corps, (DCSROTC) established the ROTC Affiliation Program. Its purpose: to enhance the recruiting and retention efforts directed toward students in high-technology fields of study. In 1987, the U.S. Quartermaster (QM) Corps joined the Signal, Ordnance, Engineer, Transportation, and Military Intelligence Corps as members of the ROTC Affiliation Program.

The QM Corps sought ROTC affiliation after having defined a need for more officers with degrees that supported the ever increasing sophistication and complexity of providing support to the Army of Excellence. Specifically, the QM Corps requires more officers with degrees in petroleum engineering, food science technology, environmental engineering (water), textile engineering, computer science and industrial engineering. Although many ROTC cadets choose to branch Quartermaster, there has been a shortfall of candidates with high-tech credentials.

A major reason for establishing the ROTC affiliation program is to clear away misconceptions that contributed to that shortfall. Among those misapprehensions are:

The misconception that the Army will not use the technical skills of engineering and physical science degree holders.

The belief among the academic community that military science is not a viable career option for technical students.

A lack of communication from the Army to students concerning the opportunities for technically qualified personnel in military service.

The QM ROTC affiliation program seeks to ensure that more students, faculty and administrators in the engineering and physical science community are aware of the opportunities available to them through ROTC. It also provides information about the opportunities and advantages of military service and/or a military career.

Three schools have been selected for affiliation with the QM Corps: Cornell, Texas Tech, and Syracuse. These schools were chosen primarily for specialized courses of instruction they offered; Texas Tech for Petroleum Engineering and Energy

Management; Cornell, for Subsistence and Food Science; and Syracuse, for the programs it offers in the fields of logistics management. All of these areas of study correspond to QM requirements.

The ROTC Affiliation will facilitate direct proponent support to the Professor of Military Science (PMS) at these schools. Further, under the terms of the affiliation, the PMS positions are guaranteed to Quartermaster officers whenever possible. In June of 1989, the PMS positions at Cornell and Texas Tech will be filled with QM officers.

Quartermaster recruiting efforts will not be limited to cadets already enrolled in the ROTC program, but will also focus on students enrolled in the disciplines required by the Corps. As part of the affiliation, the QM branch proponent will become active in special recruiting, providing marketing to generate the interest among high-tech students at the affiliated universities. It will also organize other programs, to include a guest speaker and visitation program which will serve to inform interested students about the academic requirements as well as of the progress of the Quartermaster Corps.

As part of this effort, contact teams from the QM branch proponent will be involved with such activities as participating in recruiting activities, as well as conducting less formal visits with faculty and students. Likewise, tours of U.S. Army installations are to be arranged as part of cultivating centers of influence directed towards high-tech students. Local publicity provided by the QM proponent will underscore these efforts, all aimed at ensuring that high-tech students are aware of the opportunities offered as part of military service. These opportunities include postgraduate study, professional development, and military education.

As part of the affiliation program, the PMS, in conjunction with Cadet Battalion will provide the Corps proponent a roster of all high-tech cadets. They will also assist the proponent office in its recruiting and marketing initiatives. The proponent office offers additional support by working to provide Cadet Troop Leader Training (CTLT) spaces for cadets from affiliated schools who seek to participate. Funding for those spaces will be done within existing agreements and funding limitations. Inter-branch cooperation is also essential to the success

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of the affiliation program. Because each proponent participating in the program is targeting selected academic degrees, students need to be encouraged to branch appropriate to their degrees.

Participation in the affiliation program does not authorize additional manpower requirements for the QM Corps. All actions and support will be conducted within existing resources. It is also important to remember that affiliated ROTC programs remain open to all students, regardless of their academic disciplines. Commissionees from affiliated detachments are eligible for any branch for which other qualified. Further, branch specific training will not be introduced in the Program of Instruction (POI). MQS I remains the cornerstone of the officer training system; affiliation in no way replaces it. Finally, the chain of command from Commander, U.S. Army ROTC Cadet Command to PMS remains unchanged. Quartermaster

proponent involvement is only for support of the PMS.

The QM Corps enters the ROTC Affiliation Program confident that it will increase the high-tech credibility of the Army. Within the next few years, it is hoped that 40% of the officers commissioned through the ROTC program hold high-tech degrees. Given the ever increasing technical nature of the QM support mission recruiting and retaining high-tech QM officers becomes a priority. As the QM Corps prepares to meet the challenges of 1989 and beyond, it must develop strategies to enhance its warfighting support capabilities, by implementing high leverage technologies and improving its force structure. The ROTC affiliation program can provide the vehicle to attract quality students in the degree fields needed to propel the Quartermaster Corps into the 21st century.

COMMAND

CPT JOHN LOOMIS

After completing the Advanced Course, the junior Quartermaster (QM) officer faces a new world and a new list of priorities. For most, its time to turn their thoughts to pursuing command, the most essential step in becoming branch qualified.

Having completed the Advanced Course in the summer of 1988, command was certainly on my mind. My orders had arrived, assigning me to the 7th S&T Battalion, part of the 7th Infantry Division (Light) in Fort Ord California and I set out to inform myself of command opportunities in that area. The officer personnel proponent at Fort Lee provided the information: six QM company command are located at Fort Ord and before my assignment there was completed, I wanted to have held one of them.

Like most of my peers, I'd "known about" company command for quite some time. Command was the big one, a long anticipated challenge, an inevitability. I'd read about it for years, studied it in the Advanced Course classrooms, and watched my own company commanders from various vantage points during my first assignments. I'd made lots of mental notes about things I would or would not do in a command position. Experience gained as a platoon leader, and lessons learned while serving as Battalion S-4 were added to the soup, filed for future reference. Command was to be a rich experience. Command was to be a square shouldering of a wide variety of responsibility.

I knew about those responsibilities. First on the list was fulfilling the mission, and maintaining the

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welfare of the unit's troops. Leadership in command also meant meeting training requirements, the supply, care and maintenance of equipment, mess requirements and transportation considerations. I knew about the importance of the administrative aspects, and the overall need for effective management. Then there was the human element, the knowledge that as a company commander I'd have to handle an infinite variety of situation that might arise as part of being responsible for the men and women who would be my troops.

I also knew about the visible rewards that accompany command: promotion, increased pay, decorations and going on to more challenging assignments all hinge on a command profile. The invisible rewards were also part of my mind-set: command was a challenge, and in meeting it I anticipated satisfaction. Mission accomplishment, seeing unit personnel working as a team, earning the trust, respect and approval of both my troops and superiors, were all a foreseeable part of the challenge met.

I arrived at Fort Ord, and expressed my desire to command to the commander of the 7th S & T Battalion. He selected me to command a forward support company. On December 2 1988, I was passed the "A" company guidon.

* * * * *

The junior officer "knows about" the many facets of command, but doesn't have the opportunity to gauge whether he or she knows how to command until passed the guidon. Even at that moment, knowing how is an elusive commodity; the new commander is an outsider to the organization. Of all of the elements that go into command of a given unit the most familiar is him or herself.

That's a good start. Without a clear idea of one's own abilities and shortcomings you have no foundation on which to base the "how" of command. Tapping into your strengths and working to remedy your shortcomings is the key to achieving professional competence and performing as an effective leader. The process of seeking the necessary skills

and balance to guide your command to act as a cohesive unit is each commander's goal. Within a company command the opportunities for gaining that knowledge and balance are offered everyday.

Each individual's command experience is unique. Within the Quartermaster Corps 200 plus commands the variables are considerable. Company size ranges from 38 to 360 personnel, and functional responsibilities vary almost as widely. Due to the diversity of the QM mission some companies might be comprised of over 21 highly technical MOSs. Moreover, most companies are charged with a definitive peacetime mission in addition to maintaining a war-ready status. In short: there's a lot for the new commander to learn.

From day one, the company commander is charged with the responsibility and privileged with the authority to regulate the actions of his unit. It's a hands-on proposition, not limited to the framework of the unit proper, but affecting the unit's interaction with the total force. This makes that commander highly visible. The results of his or her efforts to accomplish the mission are immediately evident, and the state of the unit's personnel, equipment and administration are on display at all times.

This visibility accounts for the critical nature of evaluations of persons in command positions and concurrently, the need for each commander to muster all resources available to him or her to assure the success of that command.

While Quartermaster captains have long been encouraged to aggressively seek command, its importance was driven home following the release of the 1988 QM Majors promotion selection list. Compared to an overall Army selection rate of 67.8%, Quartermasters fell short, with a selection to major of 57.3%. A closer look at non-selects hammered the point in; of the 72 officers not selected for promotion, 61 had not completed a successful O-3 command. (Figure 1) The message- accomplishing a successful company command is essential to promotion.

MAJOR NON-SELECTS

17	OFFICERS HAD NO COMMAND
36	OFFICERS HAD BELOW AVERAGE COMMAND REPORTS
8	OFFICERS WERE IN COMMAND 12 MONTHS
9	OFFICERS HAD POOR OVERALL MANNER OF PERFORMANCE
1	MISCONDUCT
1	NO IDENTIFIABLE REASON
72	TOTAL

***BOTTOM LINE – COMMAND IS THE KEY FACTOR**

FIGURE 1

There are currently over 200 company level commands available to Quartermaster officers worldwide. These include: Supply Companies, Forward Supply Companies, General Supply Companies, Supply & Service Companies, Repair Parts Companies, Heavy Material Supply Companies, Petroleum Terminal Operating Companies,

Petroleum Supply Companies, Petroleum Laboratory Detachments, Supply & Transport Companies, Troops, Airdrop Supply Companies, Airdrop Equipment Repair Supply Companies, Airdrop Detachments, Headquarters Companies and Detachments, and AIT Training Companies.

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03 COMMANDS

FT CARSON, CO
HHC, 43D SUPPORT GROUP
HHC, 4TH ID DISCOM
SUPPLY CO., 4TH FSB
SUPPLY CO., 204TH FSB
SUPPLY CO., 64TH FSB
SUPPLY & SVC CO., 704TH MSB
FT RILEY, KS
SUPPLY CO., 201ST FSB
SUPPLY CO., 101ST FSB
SUPPLY & SVC CO., 701ST MSB
FT CAMPBELL, KY
102D POL SUP CO.
53D AIRDROP SUPPORT DET.
227TH GENERAL SUPPLY CO.
HSC, 426TH S & T BN
HHC, 561ST S & S BN
SUPPLY CO., 426TH S&T BN
FT POLK, LA
HHC, 5TH DISCOM
SUPPLY CO., 105TH FSB
SUPPLY CO., 5TH FSB
SUPPLY & SVC CO., 4TH MSB
FT BENNING, GA
HHC, 197TH SUPPORT BN
S & T CO., 197TH SUPPORT BN
FT RUCKER, AL
108TH POL SUPPLY CO.
FT KNOX, KY
SUPPLY CO., 75TH SUPPORT BN
CAMERON STATION, VA
DEF. FUEL SUPPLY CENTER
FT DRUM, NY
HSC, S & T BN
FWD SUPPLY CO., 10TH S & T BN
FWD SUPPLY CO., 10TH S & T BN
FWD SUPPLY CO., 10TH S & T BN
HHC, 10TH ID DISCOM
HHC, 548TH S & S BN

FT LEWIS, WA
SUPPLY CO., 99TH FSB
SUPPLY CO., 109TH FSB
SUPPLY CO., 209 TH FSB
SUPPLY CO., 9TH AVN SUP BN
SUPPLY & SVC CO., 709TH MSB
295TH GENERAL SUPPLY CO.
543D SUPPLY HVY MAT CO.
HHC, 9TH ID DISCOM
FT ORD, CA
FWD SUPPLY CO., 7TH S&T BN
FWD SUPPLY CO., 7TH S&T BN
FWD SUPPLY CO., 7TH S&T BN
HHC, 7TH ID DISCOM
590TH SUPPLY & SVC CO.
HSC, 7TH S&T BN
FORT IRWIN, CA
SUPPLY CO., NTC SUPPORT BN
FT BLISS, TX
S&T CO., 3D SUPPORT SQDN
FT HOOD, TX
53D POL SUPPLY CO.
289TH GENERAL SUPPLY CO.
565TH REPAIR PARTS SUPPLY CO.
62D SUPPLY & SVC CO.
HHC, 553D SUPPLY & SVC CO.
HHC, 13TH COSCOM
HHC, 2D AD DISCOM
HHC, 1ST CAV DISCOM
SUPPLY CO., 115TH FSB
SUPPLY CO., 15TH FSB
SUPPLY CO., 502D FSB
SUPPLY CO., 48TH FSB
SUPPLY & SVC CO., 124TH MSB
SUPPLY & SVC CO., 27TH MSB

SCHOFIELD BARRACKS, HI
HHC, 45TH SUPPORT GROUP
40TH SUPPLY & SVC CO.
HSC, 25TH S & T BN
FWD SUPPORT CO., 25TH S & T BN
FWD SUPPORT CO., 25TH S & T BN
FWD SUPPORT CO., 25TH S & T BN
HHC, 25TH ID DISCOM
FT LEE, VA
HHC, 240TH QM BN (POL)
109TH POL TML OP CO.
267TH POL TML OP CO.
16TH FIELD SVC CO.
54TH GRAVES REGISTRATION CO.
22D PETROLEUM DET
23D PETROLEUM DET
HHC, 23D QM BDE
HHC, 266TH QM BN
B CO., 266TH QM BN
C CO. (ABN), 266TH QM BN
E CO., 266TH QM BN
F CO., 266TH QM BN
M CO., 266TH QM BN
H CO., 262D QM BN
L CO., 262D QM BN
P CO., 262D QM BN
R CO., 262D QM BN
U CO., 262D QM BN
V CO., 262D QM BN
A CO., 244TH QM BN
G CO., 244TH QM BN
W CO., 244TH QM BN
HHC, TROOP SUPPORT AGENCY

HUNTER AAF, GA
HHC, 260TH POL SUP BN
110TH PETRL SUPPLY CO.
FT STEWART, GA
HHC, 24TH ID DISCOM
SUPPLY CO., 224TH FSB
SUPPLY CO., 24TH FSB
SUPPLY & SVC CO., 724TH MSB
FT JACKSON, S.C.
HHC, 277TH QM BN
A CO., 277TH QM BN
B CO., 277TH QM BN
C CO., 277TH QM BN
D CO., 277TH QM BN
FT BRAGG, N.C.
HHC, 15T COSCOM
HHC, 530TH S & S BN
HSC, 407TH S & T BN (ABN)
SUPPLY CO., 407TH S & T BN (ABN)
E CO., 407TH S & T BN (ABN)
SUPPLY CO., 528TH SPEC OPNS (ABN)
HHC, 528TH SPEC OPNS (ABN)
364TH SUPPLY & SVC CO.
249TH REPAIR PARTS SUPPLY CO.
406TH GENERAL SUPPLY CO.
HHC, 46TH SUPPORT GROUP
49TH AIRDROP DETACHMENT
600TH AIRDROP EQ. REPAIR SUPPLY CO.
612TH QM AIRDROP SUPPLY CO.
FT STORY, VA
549TH POL OP CO.
FT DIX, N.J.
AIT CO. 5TH TNG BDE
FT DEVENS, MA.
278TH GENERAL SUPPLY CO.
FT RICHARDSON, AK
HHC, 6TH ID DISCOM
FT WAINWRIGHT, AK
HSC, 6TH S & T BN
FWD SUPPORT CO., S & T BN
FWD SUPPORT CO., S & T BN

OVERSEAS 03 COMMANDS

GARLSTEDT
HHC, 498TH FSB
SUPPLY CO., 498TH FSB
RHEINBERG
HHC, 7TH AREA SUPPORT CMD
GIESSEN
24TH SUPPLY & SVC CO.
BUTZBACH
SUPPLY CO., 54TH FSB
KIRCH GONS
SUPPLY CO., 503D FSB
WIESBADEN
29TH SUPPLY & SVC CO.
HHC, 142D SUPPLY & SVC BN
MAINZ
SUPPLY CO., 118TH FSB
BAD KREUZNACH
SUPPLY & SVC CO., 708TH MSB
HHC, 8TH ID DISCOM
FRANKFURT
HHC, 3D AD DISCOM
SANDHOFEN
SUPPLY CO., 202D FSB
BAUMHOLDER
SUPPLY CO., 208TH FSB
ZWEIBRUCKEN
HHC, 200 TAMMC
KAISERSLAUTERN
5TH AIRDROP SUPPORT DET
993 PETROL LAB
593D SUPPLY & SVC CO.
HHC, 21ST SPEC TRPS BN
HHC, 9TH MMC
MANNHEIM
574TH SUP & SVC CO.

HEIDELBURG
HHC, 26TH AREA SPT GROUP
FULDA
HHT, 11TH SUPPORT SQDN
S & T TROOP, 11TH SUPPOT SQDN
GELNHAUSEN
SUPPLY CO., 45TH FSB
HANAU
58TH GENERAL SUPPLY CO.
56TH REPAIR PARTS SUPPLY CO.
53D SUPPLY HVY MAT CO.
HHC, 16TH AREA SUP GROUP
26TH SUPPLY & SVC CO.
SUPPLY & SVC CO., 122D MSB
SCHWEINFURT
SUPPLY CO., 3D FSB
ASCHAFFENBURG
SUPPLY CO., 26TH FSB
BAMBERG
SUPPLY CO., 125TH FSB
WURZBURG
493D SUPPLY & SVC CO.
SUPPLY & SVC CO., 703D MSB
SUPPLY CO., 203D FSB
KITZINGEN
HHC, 3 ID DISCOM
ERLANGEN
SUPPLY CO., 47TH FSB
VILSEK
SUPPLY CO., 501ST FSB
FURTH
SUPPLY & SVC CO., 123D MSB
HHC, 1ST AD DISCOM
240TH SUPPLY & SVC CO.

NURNBURG
S & T TROOP, 2D SUPPORT SQDN
HHT, 2D SUPPORT SQDN
CRAILSHEIM
HHC, 7TH AREA SUPPORT GROUP
LUDWIGSBURG
226TH SUPPLY & SVC CO.
HHC, 13TH SUPPLY & SVC BN
STUTTGART
11TH HVY MAT SUPPLY CO.
GOPPINGEN
HHC, 299TH FSB
SUPPLY & TRANSPORT CO., 299TH FSB
BOBINGEN
496TH REPAIR PARTS SUPPLY CO.
NELLINGEN
75TH GENERAL SUPPLY CO.
AUGSBURG
HQ CMD, USA FLD STATION
299TH SUPPLY & SVC CO.
HHC, 2D PETROLEUM GROUP
114TH PETRL PL TML OP CO.
20TH PETRL PL TML OP CO.
78TH PETRL PL TML OP CO.
4TH AIRDROP SUPPORT DET
HHC, 2D ID DISCOM
HHC, 2D ID MMC
SUPPLY CO., 2D S & T BN
HHC, 2D S & T BN
348TH SUPPLY & SVC CO.
305TH SUPPLY & SVC CO.
HHC, 19TH SUPPORT CMD
HHC, 6TH MMC

OTHER OVERSEAS
HHC, U.S. ARMY FLD STATION BERLIN, FRG
SUPPLY CO., 6TH SPT BN, BERLIN FRG
HHC, 5TH SETAF SUPPORT, VICENZA, ITALY
SUPPLY CO., 324TH SUPPORT GROUP, FT CLAYTON, PANAMA
SUPPLY CO., 193D SUPPORT BN, FT CLAYTON, PANAMA
HHC, LOG SPT UNIT, SINAI
SUPPLY CO., LOG SPT UNIT, SINAI
HHC, 35TH SUPPLY & SVC BN, SAGAMI, JAPAN
COMMANDS CURRENTLY CODED 03A FILLED BY QM, OD, TC BUT CHANGING TO QM
HHC, 6TH AREA SUPPORT GROUP, STUTTGART, FRG
HHC, 29TH AREA SUPPORT GROUP, KAISERSLAUTERN, FRG
HHC, 54TH AREA SUPPORT GROUP, RHEINBURG, FRG
HHC, 53D AREA SUPPORT GROUP, BAD KREUZNACH, FRG
HHD, 32D MMC ADSCOM, WORMS, FRG
HHD, 19TH MMC WIESBADEN, FRG
HHC, 193D SUPPORT BN, FT CLAYTON, PANAMA

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Additionally, many Quartermaster officers obtain multifunctional logistics experience by commanding in other units - Maintenance, Transportation, Medical Service, etc.

The current command opportunity for Quartermaster captains assuming 18 month command tours, except 12 months for Korea/Sinai is:

**QM COMMAND
200**

**INVENTORY
1330**

**COMMAND OPPORTUNITY
68%**

The 68% figure is in line with the number of QM captains with qualifying files who desire to remain on active duty. Individual company commands and their locations are shown in Figure 3. Once more, the importance of attaining and successfully completing one of those commands to the progression of your military career cannot be over emphasized.

Defining what constitutes a successful command is more difficult than pointing out where those commands are. It is always good advice to not only understand yourself, your units mission, and the mission of the Corps as a whole, but also to learn early what your battalion commanders policies, priorities, and pet peeves are. To a great extent, his priorities must become yours if you are to function as an effective part of the battalion. A useful analogy appeared in the September-October 1988 Infantry Bulletin.

"Company command has been described as a neverending juggling act, with some rubber balls that will bounce when dropped and some glass balls that will shatter. Most battalion commanders are looking for company commanders who can keep the glass balls in the air all of the time and the rubber balls in the air most of the time. Your glass balls will probably be troop welfare and safety, property accountability, maintenance, and training management. In a peacetime environment the statistical indicators of success in these areas, for better or worse, will probably determine how well you perform as a commander. For this reason it is important to devote your time and energy primarily to the important areas and only secondarily to other things that may interest you more."

Quartermaster company commanders should add mission support to the list of "glass balls" to be juggled. Another thing to keep in mind: your battalion commander needs to know if the juggling gets hairy, and he needs to know quickly, from you.

Make sure that you communicate effectively with him.

The relationship between a company commander and battalion staff officers is another that cannot be overlooked. They rely on, and as such, you must provide timely and accurate input about your company to them. Your actions in this respect directly effect staff officers ability to do their jobs. Paralleling this, without their support, you will find it difficult to coordinate and execute your own programs.

The list of vital working relationships goes on. Within the company framework, you will find that a large part of your duties involve leading leaders. Doing that well: focusing on their professional development, coaching, counseling, pushing and sometimes even pulling them, is a major factor in the overall success of the unit. Your stance as commander will affect your lieutenants in particular. At this formative stage in their career, the lessons they learn from you are bound to have a tremendous impact on their development, just as your first commanders impacted on yours.

Noncommissioned officers are another link in the chain of command. Time and time again it has been said that NCOs can make or break a unit. This sentiment merits consideration. No two relationships between company commanders and their first sergeants are alike. There is no one "right" way to conduct them, but developing a strong working relationship with your first sergeant, usually the most experienced soldier in the company, is essential. Mutual respect and confidence need to be established between you, and conveyed to the troops. This means allowing the first sergeant to do his job, and insofar as his performance and the quality of his advice merits, to participate in the unit's decision making process.

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Basically, the development, disciplining and standards of your NCOs are implemented by your first sergeant. It remains your duty to underscore the status of all your NCOs. This is a necessary part of instilling in them an understanding of how important their duties and responsibilities are, and how they differ in an essential way from the troops they lead. Unless those NCOs understand that they are personally responsible for each appointment a soldier misses, each dirty weapon, or any inventory imbalance, the unit is lacking an essential link in its makeup, you, an essential arm of the chain of command.

All of those NCOs probably will have been, or will be with the unit longer than the term of your command giving them a singular vantage point. Their perception of the units current status is formed by months, or even years of personal observation and experience. As a result, that perception is usually on target referencing the day-to-day details of the units functions. Their views on where the unit is, and where it needs to go must be accorded weight in proportion to the arena of their responsibility. With this in mind, you must allow your NCOs to function as the crucial troop leaders they're intended to be, with guidance, but without constant supervision from you or your officers.

Despite the importance of making the most of the experience and expertise of your subordinate leaders, there is one thing every commander comes to understand. Bottom line, the toughest decisions are yours alone. You have been granted the power to reward and punish behavior. Your decisions regarding the promotions, training and slotting of personnel in your unit will have a major effect on their careers. Realization of the impact of your authority should not be intimidating, nor intoxicating. Still, no matter how prepared you are to command, the ramifications of power come as a bit of a surprise. As a commander, you are in a place apart, detached from those you lead living with your decisions and actions in the first person singular. Regardless of your age, you are now the "old man".

Your detachment will feel greatest in regards to your relationship with your troops. By its nature, command circumscribes that relationship, even if a command is exercised in an approachable, empathetic way. Moreover, in any given command, particularly in those of companies numbering

200+, it is almost impossible for a commander to be with his troops all, if even most, of the time.

The big thing is this: be yourself and, when there, one-on-one with a soldier, make certain your actions are real, the concern you impart authentic. The efforts put forth on those occasions go a long way towards establishing a good working relationship with, and garnering the respect of your troops. Keeping that respect is vital. Soldiers don't like being misled and have an uncanny ability to detect a scam or deceit. Your credibility is key to maintaining a good command posture. Your troops will make allowances for an occasional mistake if they see that you learned from it, but heaven forbid you attempt to bluff your way out of a problem they already noticed.

Consistency is another plus point. Troops expect you to meet the standards you set for them. They expect the standards to be known quantities, not something that changes on an hourly basis. They will also expect you to be fair, meting out reward and punishment on a uniform scale, in response to a clearly spelled set of rules. Most of all — they will expect you, rightly so, to be there when it really counts. They won't feel badly about being exhausted and dirty if you are too. Command is basically an inverted pyramid: your troops form the broad base on top, with you at the bottom, balancing the body of the unit on a point. The commander who thinks that the position allows him to sit above his unit, exempt from unpleasant tasks and situations has a rude awakening coming.

For the Quartermaster officer, success in command requires another consideration, foreign to most combat arms units. Whereas operational requirements may enter inactive phases, sustainment does not. The day-to-day mission of a QM company is a real one, the training required not a simulation. When supporting an exercise the QM companies are often the first in the field and the last to leave. Back at the garrison, a typical stand down is not the norm. The daily mission of issuing supplies, pumping fuel, packing parachutes must be met while after exercise maintenance and inventories are accomplished.

As a result, definitive peacetime missions can easily begin to take precedence over all other duties in the minds of your soldiers. Maybe in your mind as well. Any number of QM commanders can tell

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tales of soldiers and NCOs within their units, choosing to work on the tasks of their daily mission as opposed to the exercise at hand. Why? Because those soldiers were apprehensive about "getting behind" in regards to their garrison obligations, and the exercise represented a foul-up in the works. The fact is that field exercises are not designed for logisticians. None the less, QM commanders must remember that like all unit commanders, they must be prepared to lead their troops in battle. Equally important, he must impress upon his troops that the possibility does exist, garrison mission or not, and they must be prepared for it.

The key to that preparation, and to a great extent, the success of your command rests in your ability to properly prioritize your units responsibilities, then train your unit to meet them. Guidance from higher authority will dictate a great part of the priority and training list, input from those you lead and a good dose of common sense will establish most of the rest.

Common sense, exercise of will, and ability to see the multiple facets of your company are essential to dovetailing all of the activities which must come together to assure its combat readiness and overall success. Flexibility will be another determining factor. Look to your commander for insight on how to

lead and learn never to adhere stubbornly to any given plan. Likewise, learn not to abandon the ideas that gave rise to that plan. Pay attention to detail, and meet your commitments fully. The best way to accomplish this is to be a good time manager and to have a clear, realistic picture of your unit's roles, goals, abilities and objectives.

Volumes have been written on the subject of command. They, like this article, can never hope to offer a whole picture or a complete guide. Your command will be unique, and like most commanders, you will find it a personally and professionally enriching experience, but it won't be perfect. Moreover, there are no perfect commanders, but there are those who are outstanding because of their ability to muster and then combine the strengths of those they lead to an overall unity of action. That ability forms the standard for which we are measured for greater responsibilities and more challenging positions, and the standard we as commanders should seek to make our own.

*CPT John C. Loomis is the
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CAREER NOTES

MASTER WARRANT OFFICER PROGRAM

On 8 December 1987, DA convened the first Master Warrant Officer (MWO) board to select Senior CW4s for schooling and assignment. The primary role of a master warrant will be that of an organizational technical/tactical trainer, and advisor to the commander in planning and policy making. Master Warrants will play a critical leadership role in the training and readiness of units and the acquisition and force integration of new systems.

Quartermaster (QM) MWO positions are MOS 920A, Property Book Technician, 15 Authorized; 920B, Repair Parts Technician, 17 Authorized; 921A, Airdrop Systems Technician, Authorized 1; and 922A, Food Service Technician, 4 Authorized. Currently, a shortage of personnel meeting selection criteria exists and as such, it is anticipated that it will take some time before QM MWO requirements are filled.

In order to be considered for MWO selection by the 1990 board, personnel must:

1. Be Regular Army.
2. Be a graduate of a Warrant Officer Advanced Course or the Warrant Officer Senior Course (Military Education Level (MEL) Code B or A respectively).
3. Have completed at least 2-years of college (Civilian Education Level (CEL) Code 6).

The zones of consideration are:

Primary zone = Temporary Date of Rank (TDOR) as a CW4 of 31 December 1982 or prior.

Secondary zone =

Aviation Warrants - TDOR as a CW4 of 7 January 1983 to 31 December 1983.

Technical Services - TDOR as a CW4 of 7 January 1983 to 31 December 1984.

Before being accepted into the Master Warrant Officer Training Course (MWOTC), personnel must be executed the oath (DA Form 71) to be a commissioned warrant officer if they have not done so previously.

Selectees who have accepted their selection then attend the Master Warrant Officer Training Course. This course of instruction is designed to provide the

training required to perform at the highest levels of Warrant Officer. Positions designated MWO exist at Battalion, Brigade, Installation, MACOM, Proponent, HQDA, DOD, Joint Activities and even the White House Staff level.

The MWOTC consists of a minimum of two phases. Phase I is a lead-in self study, correspondence course designed to reinforce and update your previous training, experience, skills and knowledge. Phase II is a branch immaterial course taught in residence at the U.S. Army Aviation Center, Fort Rucker, Alabama. Lasting eight weeks, Phase II's greatest emphasis is on applying the skills and knowledge gained or reinforced during Phase I. Instructional materials include modules on communication skills, staff skills and management, force integration and leadership and management among others.

The common core curriculum of the MWOTC is supplemented by training on the organization and functions of the Army. Training on joint and combined commands is also included. The training is designed to broaden the warrant officer's intellectual depth and managerial ability.

Upon completion of Phase II, AC Quartermaster Warrant Officers may be required to report to the U.S. Army Quartermaster School (QMS) for a branch orientation and update. If needed, additional functional training will then take place, either at Fort Lee, Virginia or enroute to new duty station.

Master Warrant Officer Training for the Reserve Component will also consist of two phases, a non-resident followed by two week active duty resident course conducted at the U.S. Army Aviation Center.

The number of MWO's in the Army will be approximately 4-5% of the total Warrant Officer population. Their functions will go beyond the technical and professional aspects of a single MOS. Master Warrant Officers will be able to integrate branch functions and be possessed of the requisite understanding of the interface between related technical/tactical systems. Master warrant functions will further require strong communicative skills, leadership ability and the know-how to integrate, manage or develop new systems.

COMING UP IN THE QMPB

*Summer 1989 - Petroleum distribution
(Echelons above Corps)*

Autumn 1989 - Supply/Logistics Automation Systems

Winter 1989 - Class IX Systems

In order to better accommodate our reading audience, the Quartermaster Professional Bulletin is now being distributed individually to Active Duty personnel at the grade of E-8 or higher. Unit distribution will continue at the Battalion level for other Active Army personnel. In the Reserve Components, distribution will continue at the company level.

Officers can ensure that they receive their individual copies by making sure that the address listed on their ORB is accurate.

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