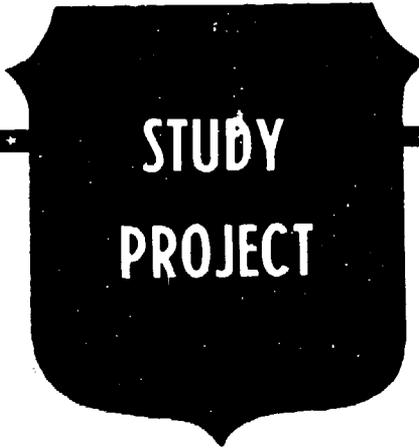


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COALITION LOGISTICS - THE MULTINATIONAL FORCE AND OBSERVERS MODEL

BY

LIEUTENANT COLONEL JOE C. CREEL, QM
LIEUTENANT COLONEL JAMES M. WRIGHT, QM

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concept plans, terrain analyses, equipment acquisition activities, consumption planning factors, force development studies, analyses of deployment of the force and conduct of logistics operations for the first 6 months of MFO's existence. A large portion of the data presented is based on the author's experiences as logistics planners and operators while assigned to the MFO during its formative stages. The data was then compared with the authors' observations of current MFO logistics policies and operations from a detailed review conducted on a one-week visit to the force in the Sinai in March, 1986. This comparative analysis of the plans and operations of 1981 with the policies and operations of 1986 conclusively indicate that (with few exceptions) the logistics system developed in the initial planning process, the consumption planning factors, decisions regarding interoperability requirements, use of a civilian support services contractor, dependence upon commercial equipment, and the infrastructure established by initial logistics operating elements produced the effective logistics system that was envisioned by the architects of the logistics concept. The development of MFO logistics system that would satisfy the needs of eleven widely divergent participating nations is a model for coalition logistics operations. Experiences from development of this logistics concept reveal a set of principles that may serve as a guide in development of logistics systems for future coalition force operations. These principles are:

- a. Support concept should be phased.
- b. Direct contact between logistics planning and logistics operations is essential.
- c. Backwards planning sequence is the best method to ensure the planning has been thorough and precise.
- d. Logistics elements must become operational before other elements arrive in theater.
- e. The logistics system must be common to all national contingents.
- f. The majority of supplies are generic.
- g. Using a combination of items from the DOD supply system and purchases from commercial sources provides flexibility and saves money.
- h. Facility construction must support the prioritized deployment schedule and fit mission requirements.
- i. Warehouse facilities must provide a surge capacity.
- j. Modular structures were outstanding for efficient operations, soldier comfort and cost.
- k. Construction of sector support sites provided a back-up to the delivery system and contingency stocks to provide area support.
- l. Purchase of commercial, off-the-shelf, equipment offers significant benefits.
- m. Contingent-unique equipment should be minimized.
- n. Entry point to DOD supply system must be established.
- o. There must be an interface with the DOD transportation system.
- p. In-transit visibility is critical.
- q. The logistics support unit should provide liaison personnel and comprehensive training to contingents.
- r. The logistics concept must provide for automation of supply records as soon as possible.
- s. The logistics support unit must be a stable, non-rotational unit.
- t. The deployed force must have an adequate local purchase apparatus.
- u. High volume, bulk supplies should be obtained from local sources.
- v. Consumption data used in planning must be precise.

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- w. A civilian support contractor can effectively support a deployed force.
- x. Property accountability must be established immediately.
- y. Requisitioning activity must be monitored to ensure supply economy.
- z. Subsistence is generic.
- a.a. Accurate shipping data is critical.
- b.b. Transport assets must be sufficient to clear ports.
- c.c. A movements control center is essential.
- d.d. Specialized equipment should be centralized and operated by a transportation unit.

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USAWC MILITARY STUDIES PROGRAM PAPER

COALITION LOGISTICS - THE MULTINATIONAL FORCE
AND OBSERVERS MODEL

A GROUP STUDY PROJECT

by

Lieutenant Colonel Joe C. Creel, QM
Lieutenant Colonel James M. Wright, QM

Colonel Bill Heizemann, TC
Project Adviser

US Army War College
Carlisle Barracks, Pennsylvania 17013
19 May 1986

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ABSTRACT

AUTHORS: Joe C. Creel, LTC, QM
James M. Wright, LTC, QM

TITLE: Coalition Logistics - The Multinational Force and Observers
Model

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- c.c. A movements control center is essential.
- d.d. Specialized equipment should be centralized and operated by a transportation unit.

PREFACE

This Group Study Project was conducted under the aegis of the Department of Command, Leadership and Management, USAWC. The general methodology of the study was to conduct a comparative analysis of initial plans for the logistics concept to support the Multinational Force and Observers and initial logistics operations in March 1982, with current logistics policies and operations. In this process, it was the objective of the group to provide, for the first time, a written record of initial logistics plans and operations in support of the MFO, to emphasize the unique challenges of logistics support for multinational or coalition forces, and to develop principles for coalition logistics, as derived from lessons learned in the comparative analysis process. The authors of the study present information based on their experiences in development of the MFO logistics concept while assigned duties as planners and operators during the formative stages of the peacekeeping force. Comparisons of initial plans with current operations are based on a one-week visit to MFO in March, 1986, almost exactly four years after the force deployed to the Sinai. The outstanding assistance of personnel in the Department of State, MFO Headquarters-Rome, Force Headquarters-Sinai, the force logistics staff, and officers and soldiers of the Logistics Support Unit was a major factor in the authors' effort. For their support and their continuing contribution to peace in the Middle East, we are grateful.

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CHAPTER I

CREATION OF THE MULTINATIONAL FORCE AND OBSERVERS

The Multinational Force and Observers (MFO) that occupies the Sinai Desert along the Egyptian-Israeli border is unique in many ways. First, it is unique in that it was born of a landmark peace treaty between two hostile nations who shared centuries of cultural differences and conflict. It is unique in that it is neither supported nor manned by the United Nations in the manner of the overwhelming majority of other modern peacekeeping endeavors. It is unique in that it affords continuous presence of United States forces in an area that has traditionally been closed to United States occupation. It is unique in that it is a nontraditional multinational organization comprising eleven different national contingents. It is unique in its manner of operation--not a buffer zone characteristic of other peacekeeping operations. And it is unique in that MFO units are supported by a logistics system that was developed specifically to serve a diverse coalition of forces in an environment that is recognized as being among the harshest and most unforgiving climes in the world. It is this unique logistics system that is the subject of this paper.

The authors of this study were part of the history of the MFO from its inception in August, 1981, until initial operations in the Sinai in August, 1982. LTC Creel was a key member of the planning staff of the MFO Headquarters that developed the logistics concept. LTC Wright commanded the first Logistics Support Unit that executed the logistics concept on the ground in the Sinai. This effort represents a rare

opportunity for a concept developer and a logistics operator to revisit a support operation and compare the then with the now, four years later, and to determine if the vision of 1981 is reflected in the reality of 1986.

We hope to accomplish several objectives in our presentation of the subject. First, we want to capture the historical evolution of the MFO logistics system for the first time in print. We also want to emphasize the uniqueness of coalition logistics operations and outline the constraints in planning that are offered by environmental conditions, multinational diversity, and political sensitivities. We want to, in effect, evaluate ourselves to determine by comparative analysis, then and now, the effectiveness of initial logistics planning and operations. And, finally, we will present a set of principles derived from lessons learned that will facilitate development of plans for future coalition logistics operations.

THE TREATY

Sensitive negotiations between President Jimmy Carter, President Anwar Sadat of Egypt, and Prime Minister Menachem Begin of Israel, to the world's amazement, produced a landmark peace treaty designed to ease tensions in the Middle East and to serve as a cornerstone for future settlement of other regional disputes. The peace treaty, commonly known as the "Camp David Peace Accords," was signed 29 March 1979 and, among other provisions, dictated the transfer of the Sinai Peninsula, captured and occupied by Israeli forces in the 1967 Egypt-Israeli War, back to Egypt. The transfer of the territory was to take place on 25 April, 1982.¹

To ensure the provisions of the treaty were carried out, the Camp David Peace Accords proposed that the United Nations field a peace-keeping force that would oversee the final Israeli withdrawal from the Sinai and ensure orderly occupation of the territory by Egyptian forces. The United Nations, however, was unable to agree on a plan to monitor the transfer and declined to provide forces to supervise the agreement. This left the United States, Egypt, and Israel the task of assembling their own peace monitoring apparatus. As a result, a protocol was negotiated, calling for a multinational military force and civilian observer unit to serve in the Sinai--outside the auspices of the United Nations.²

In this way, the protocol of 3 August 1981 created the Multinational Force and Observers and directed that it be positioned in the Sinai with the responsibility to observe, report, and verify the terms of the peace treaty. Further, the protocol established security measures which included military restrictions in the treaty zones of the Sinai, as well as in Israeli territory.

The parties to the protocol also were responsible for appointment of a Director General, who in turn appoints a Force Commander of a different nationality who is at least a general in rank. The Director General, ambassador rank, is responsible for the overall operation of the MFO and his staff handles all diplomatic matters between the MFO, Egypt, and Israel, as well as with the eleven participating nations. In addition, financial control is the essential task of MFO Headquarters, now located in Rome, Italy, and MFO has an obligation to account for expenditures to the three states that equally share funding of MFO operations; Egypt, Israel, and the United States. The Director General

is also represented by offices in Cairo and in Tel Aviv to provide a more direct link to the parties to the treaty and to the deployed force.

THE FORCE

The Force Commander of the MFO, when appointed by the Director General, is responsible for operational command of the MFO in the Sinai.

The protocol states that this deployed force

will consist of a headquarters, three infantry battalions totalling not more than 2,000 troops, a coastal patrol unit and an observer unit, an aviation element and logistics and signal units.

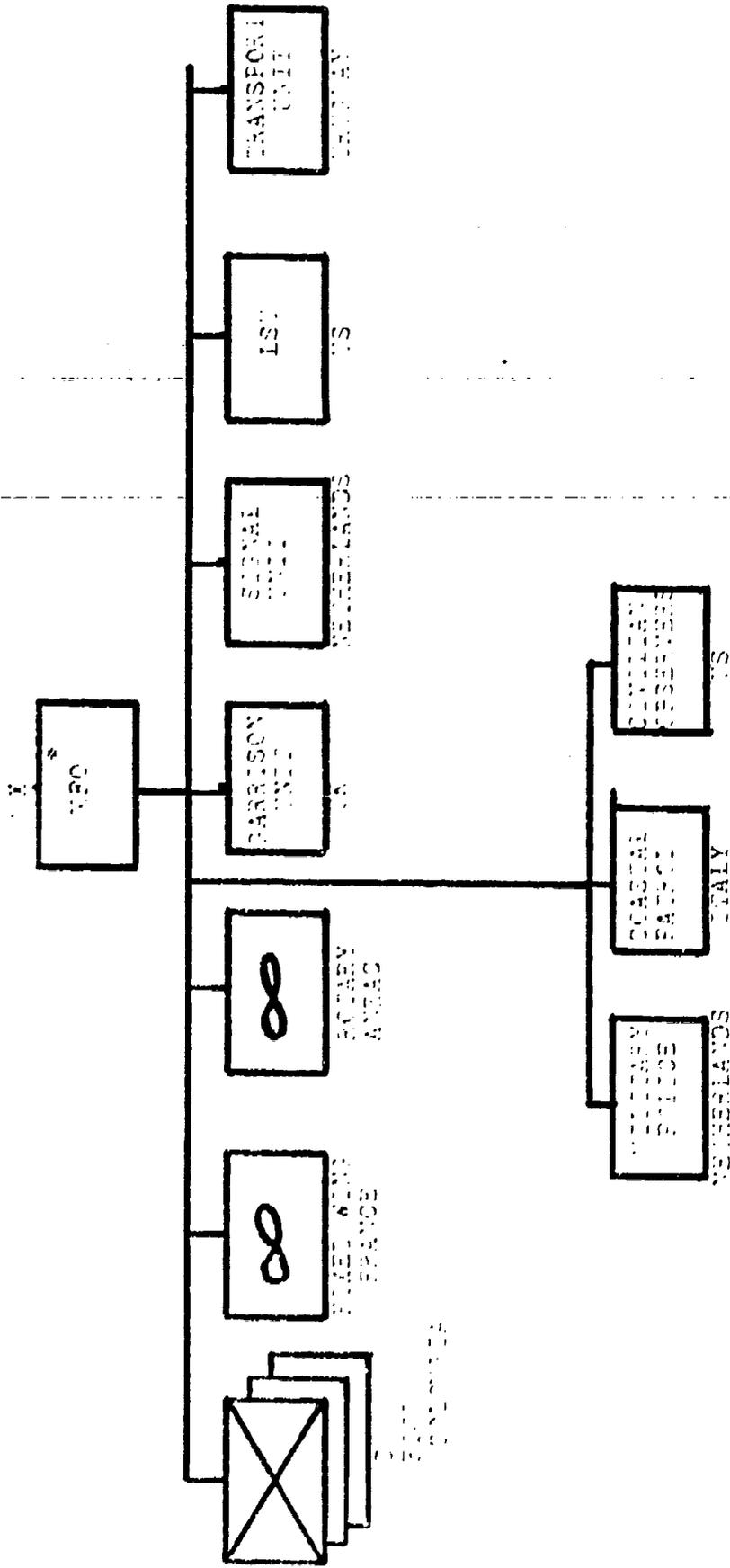
The total number of MFO personnel in the Sinai would be around 3,500, when civilian contractor personnel are included. The force would be a coalition of national contingents, agreeable to both Egypt and Israel, who accepted the invitation to participate in peacekeeping activities. And these forces, when deployed, would occupy Sinai base camps at El Gorah in the north, North Base Camp, and Sharm el Sheikh in the south, South Base Camp. Figure 1-1 depicts the organization of the force and Figure 1-2 outlines the force staff.

Negotiations with candidate participating states resulted in a force comprising soldiers from eleven nations, each providing a function vital to the peacekeeping mission, and each entering a separate agreement outlining provisions for their participation with the Director General. The force contingents are as follows:

- o Norway provides the Force Commander, his administrative staff, and the senior operations officer.

- o The United States provides a civilian observer unit which verifies compliance with military restrictions on Israeli and Egyptian forces, an infantry battalion, and a logistics support unit. The infantry battalion comprises 800 soldiers who man observation posts,

VFC ORGANIZATION CHART



Major Command Element - Norway

FIGURE 1-1

checkpoints, and sector control centers in the southern sector of the MFO zone. Its headquarters and main living facilities are located at South Base Camp. The battalion also has an air element (ten helicopters) located about ten miles north of the South Base Camp at the Ras Nasrani airfield. The Logistics Support Unit is headquartered at North Base Camp; but, it operates logistics facilities and medical dispensaries at both base camps.

- o A 500-man Colombian infantry battalion is located at North Base Camp and occupies observation posts, checkpoints, and sector control centers in the center of the MFO zone of operations.

- o Fiji also provides a 500-man infantry battalion, quartered at North Base Camp, and operating in the northern MFO zone of operations.

- o The French contingent supports the force with one C-160 Transall aircraft and 2 BH-6 Otters. The 40-person French contingent is quartered at North Base Camp and provides scheduled flights between the two main camps and to Cairo.

- o The Italian contingent of ninety officers and sailors and three patrol boats are responsible to patrol the Straits of Tiran and ensure free access to maritime traffic. The Italians live at South Base Camp when not on patrol duty.

- o The Netherlands contingent provides a military signal unit, which maintains the MFO communications system and remote communications sites, and a provost marshal/military police detachment. Netherlands personnel are quartered at both main base camps and at sector control centers throughout the MFO zone.

- o The United Kingdom contingent supports the force headquarters with a 37-man headquarters element that provides administrative, logistics, and driver support to the Force Commander and staff. The contingent is located at North Base Camp.

- o The Uruguayan contingent consists of motor transport personnel and engineering specialists who are responsible for the almost impossible task of maintaining the roads within the MFO zone that are so vital to resupply operations.

- o Australia and New Zealand provide a combined contingent, continuing a tradition begun during World War I when troops from both countries fought side-by-side in the Middle East. ANZAC provides MFO's rotary wing aviation unit, which is the primary means of transportation for the Civilian Observer Unit in its verification missions. The ten ANZAC helicopters are also vital to resupply support and medical evacuation flights to remote command posts in the Fiji and Colombia zones of operation. ANZAC is quartered in the North Base Camp. Recently, the Australian contingent withdrew from participation in MFO and is now being replaced by a Canadian rotary wing aviation unit.

o A civilian support contractor provides a wide range of support to the force, including maintenance, grounds and buildings, fire service, garbage disposal, dining facility operation, and services (barber, shoe repair, laundry, morale support). Personnel from the civilian contractor live and work in both of the main base camps and are an integral part of MFO activities.

Soldiers of the contributing nations serve tours with the MFO ranging from two to twelve months. This constant flow of personnel joining or leaving the force, combined with wide dispersion of MFO elements and the diversity of nations participating in the force, offers unusual training and logistics support challenges. The structure of the force is unique. It has a unique mission. It is a unique coalition of nations. However, the force prescribed by the protocol has proven to be an effective vehicle for monitoring the implementation of the security arrangements adopted in the Camp David Peace Accords.

THE MISSION

The mission of the MFO, as specified by the protocol, is to supervise implementation of the peace treaty and to employ its best efforts to prevent any violation of its terms. More specifically:

The MFO mission and tasks will be carried out in accordance with the rules and regulations contained in the Treaty of Peace of March 26, 1979 (and) the Protocol of August 3, 1981...The MFO nature of operation is peacekeeping. The Force is established to provide Israel and Egypt with the security arrangements that they agreed upon in the Treaty of Peace...The MFO's principal responsibility is to survey and observe activities in the area of operation, to verify and report findings, and to observe and report that confirmed violations are rectified. The MFO enforcement role implies continuous observation and reporting of any verified violation...³

To facilitate observation and verification of treaty provisions, the protocol divided the Sinai into four zones of military restriction. These zones (Figure 1-3) were agreed upon to provide maximum security for both Israel and Egypt and include:

- o Zone A - One Egyptian mechanized infantry division of not more than 22,000 personnel.

- o Zone B - Not more than four Egyptian border battalions, totalling up to 4,000 personnel.

- o Zone C - MFO operational zone, together with elements of the Egyptian civilian police.

- o Zone D - Not more than four Israeli infantry battalions, totalling up to 4,000 personnel.

The civilian observer unit is primarily responsible to monitor and verify treaty provisions in Zones A, B, and D. Using MFO reconnaissance procedures and traveling by helicopter and land vehicles, teams of civilian observers travel extensively throughout their zones of responsibility. On missions involving visits to zones A and B in Egypt, they are accompanied by Egyptian Army liaison officers. While in Zone D, in Israel, they are joined by Israeli Army liaison officers. In a complete cycle of missions, the observers visit all Egyptian and Israeli installations covered by the peace treaty. The purpose of their visits is to verify compliance with treaty limitations concerning personnel, armament, and military installations. The observers also undertake additional unscheduled verification missions that are requested by either of the parties to the treaty and are required to report within 48 hours of the request.

The observation mission in Zone C is accomplished by the three light infantry battalions and the naval coastal patrol unit. Infantry

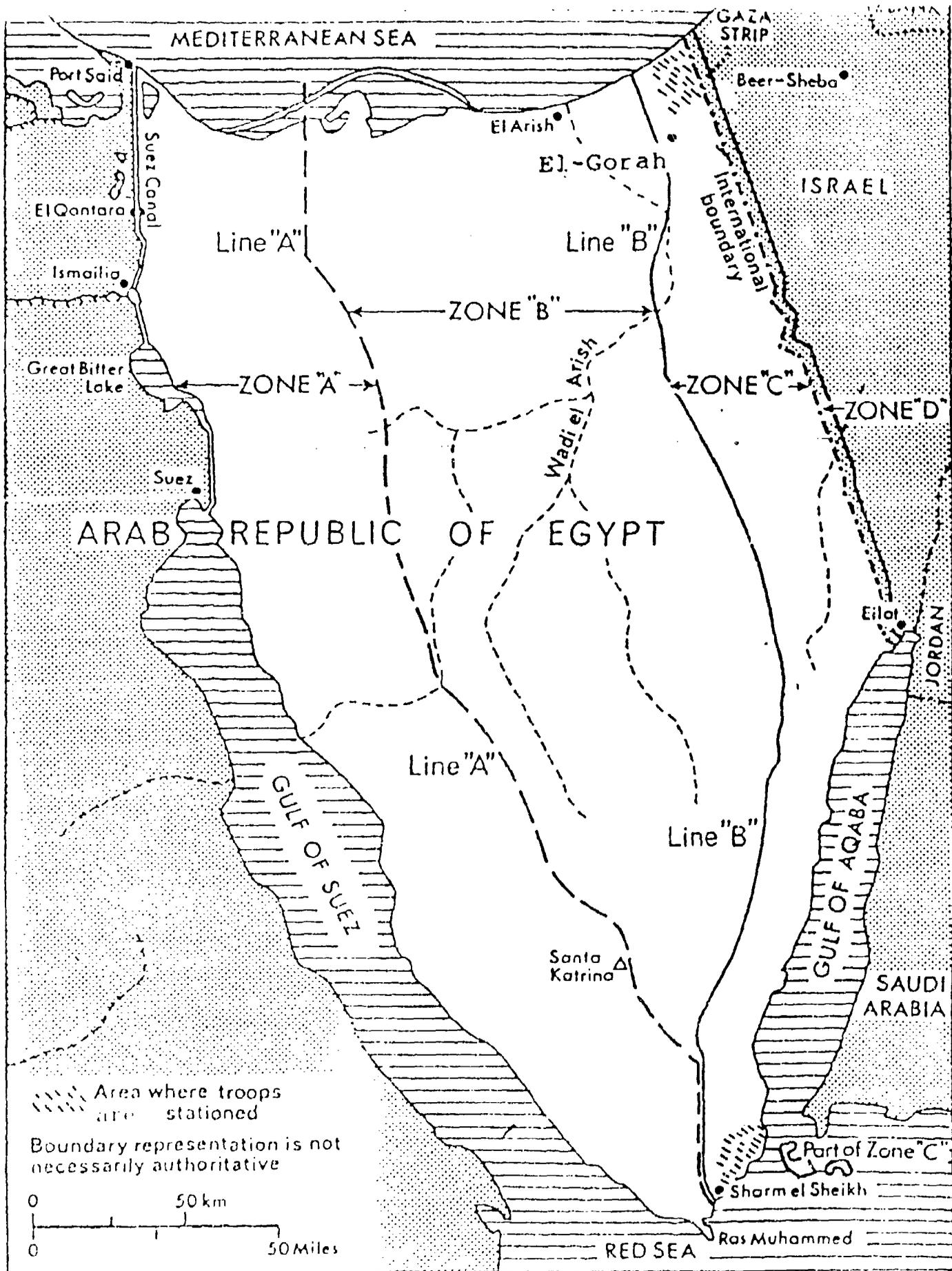


FIGURE 1-3

battalions are deployed to occupy a series of over 40 observation posts and checkpoints dispersed throughout Zone C. The Fiji battalion occupies the northern zone, the Colombia battalion the center, the United States Battalion occupies the very large southern sector of Zone C. The map at Figure 1-4 delineates areas of responsibility. Infantry soldiers man observation posts, checkpoints, and sector control centers as well as conduct foot and mobile patrols in their designated areas of responsibility. The Italian naval coastal patrol unit, based at the Egyptian port of Sharm el Sheikh, patrols the narrow international waterway of the Straits of Tiran and its approaches. Land observation teams in the United States battalion sector and on Tiran Island support the coastal patrol unit by observing the waterways from fixed land positions.

THE GEOGRAPHY

The terrain, environment, and geography of the Sinai deserves special mention because of the significant impact of these factors on survival and support of the force. In fact, a significant part of the MFO's mission is just maintaining the physical presence of the force in the austere conditions offered by a desert environment. To some, survival and sustainment of the force in Zone C is considered one of the most demanding and complex undertakings ever attempted by a peace-keeping force.

The Sinai is large (10,000 square miles in area) and extends approximately 150 miles from East to West and 280 miles from North to South. The peninsula is bordered in the North by the Mediterranean Sea, to the South by the Red Sea, to the East by Israel and the Gulf of

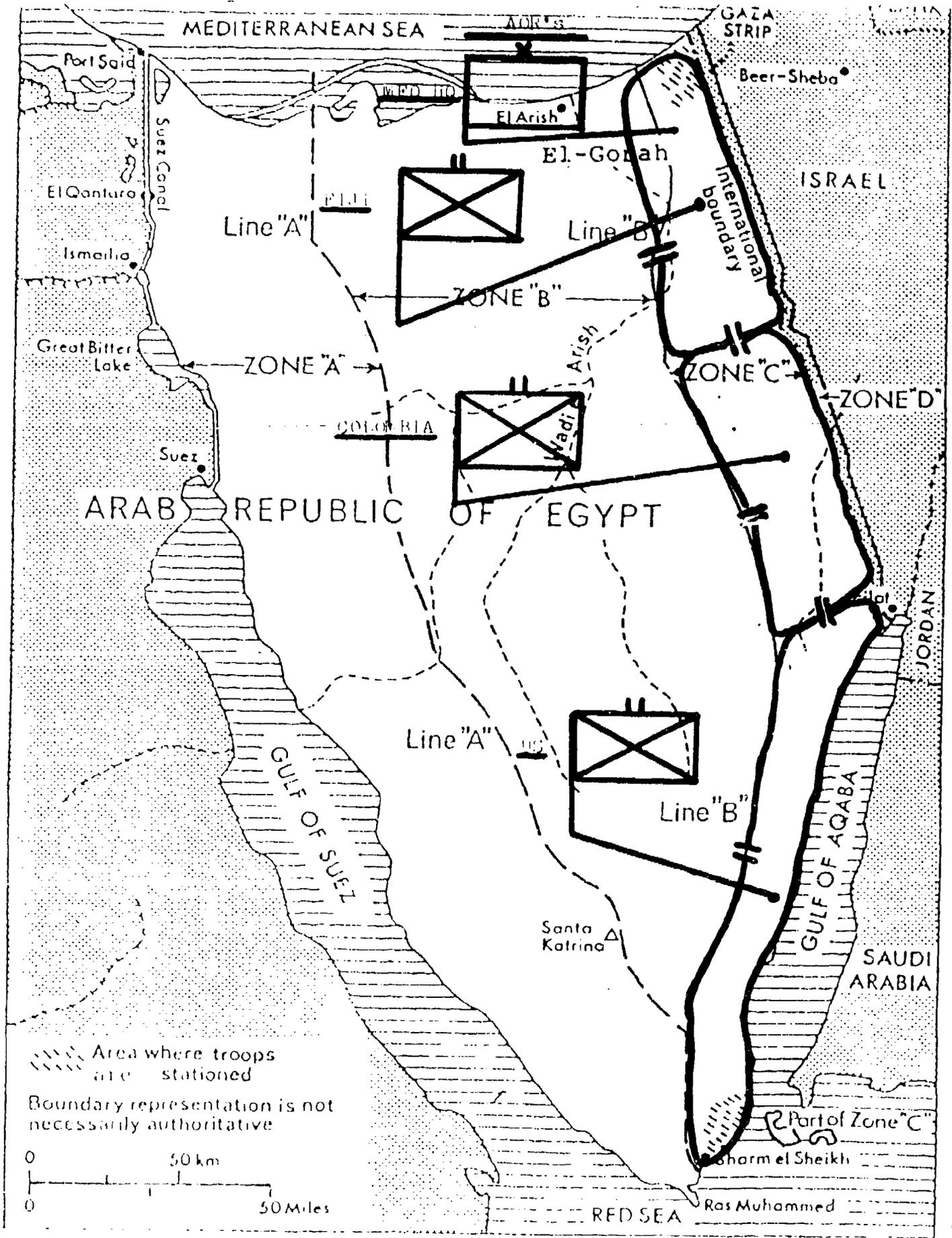


FIGURE 1-11

Aqaba, and to the West by the Suez Canal and the Gulf of Suez. The Sinai has primarily a desert climate, with temperate extremes ranging from a daily low of 40 degrees to a high of 115 degrees. The terrain ranges from narrow coastal plains, to sand dunes, to rocky plains, to mountain plateaus, to high, craggy, granite mountain formations. Sandstorms, flash floods, and "Scirocco" winds combine with desert terrain to make the Sinai one of the harshest, desolate, and uncompromising territories in the world. Figure 1-5 reflects more detailed climatological data.

THE LOGISTICS SYSTEM

Support of the 3,500-man MFO force in the environment described previously was a major concern of MFO staff planners. There were hundreds of factors to be considered, many obstacles to be overcome, too many ambiguities and unanswered questions, and too many unique constraints for which there were no precedents to offer solutions. Some of the issues which shaped the planning had no ready answers:

- o How can a single system serve the national differences of eleven contingents?
- o What was the force composition of the MFO?
- o How to tap the United States' national supply system and at the same time be autonomous from the US defense establishment? What procedures?
- o How to achieve standardization/interoperability for the force?
- o How to provide for the billeting, health, feeding, and protection of soldiers located at forty remote isolated observation posts, checkpoints, and sector control centers?
- o How to deliver supplies and services without a reliable main supply route?

CLIMATOLOGICAL DATA³

DESERT CLIMATE:

Hot Summers
Large Daily Temperature Variation
Cool Winters
Negligible Rainfall

TWO REGIONS:

Mediterranean Coast Region - 20 to 50 Miles Wide, Significant Rainfall in Winter, Moderate Summer Temperatures.

Interior/Red Sea Coast Region - Desert, Excessively Hot, Negligible Rainfall.

TEMPERATURES:

Mean daily temperatures in summer are in the 80's and low 90's along the Mediterranean coast, 90's and low 100's elsewhere. Most locations have recorded 105 to 115 degree temperature extremes. Minimums range from the 60's into the low to mid-70's. Extreme minimums in the 20's and 30's have been experienced in most locations.

SURFACE WINDS:

Moderate Force, principally from the North, except along the Mediterranean Coast.

Wind speeds of 17 knots or greater along the Mediterranean Coast in Winter and the Red Sea Coast in Summer.

"Khamsin" is a hot, very dry, dust-laden wind. Occurs in March and April. Lasts an average of three or more days. Carries dust and sand long distances at altitudes up to 40,000 feet. Also known as "Scirocco."

FLASH FLOODS:

Occur October-May.

Dry river beds and Wadis become raging torrents.

FIGURE 1-5

- o How to account for supplies and property in an international setting?
- o How to provide for 3,500 soldiers in two desert base camps?
- o How much water? Food? Fuel?
- o What should be the composition of the logistics unit?
- o What will happen when an international border is established between Zone C and nearby Israeli ports?
- o How to provide maintenance, facilities and grounds, fire fighting, waste disposal, and services (laundry, etc.) support?
- o How will supplies be shipped from CONUS to the Middle East, received, moved, and distributed?

These questions only give you the flavor of the problems faced by MFO logistics planners. There was the desert to contend with. There were the cultural and national differences of a coalition force to consider. There were political sensitivities to avoid. There were no precedents. And, most important, there was not much time. The staff was formed in November 1981, and their task was to have the MFO in place and operating by 15 March 1982. The timetable is at Figure 1-6. Five months to conceptualize, create, deploy, and operate a logistics system. The dates were concrete. They were political. Time would not change.

SUMMARY

This chapter traces the history of the beginnings of the Multinational Force and Observers--Sinai by reviewing the treaty, the configuration of the force, the mission, the environment, and an initial taste of the logistics support task. Subsequent chapters will

OPERATIONAL TIMETABLE

Not later than Nov..... Conduct mission analysis for stated and implied tasks--issue commander's guidance to the planning staff--develop milestone schedule.

Develop Force Commander's staffing concept--begin predeployment planning.

Identify communications requirements. Identify Signal, Coastal Patrol, and Aviation support elements.

Force Commander and staff reconnaissance--identify boundaries, checkpoints, observation points, etc.

December..... Establish nonstandard equipment requirements--develop unit deployment schedules--conduct unit commanders' and staff reconnaissance of Sinai.

Develop an interoperability plan for the force, to include linguistics/compatibility of communications equipment, spare parts, reports, vehicles, etc.

Regulations, directives, and SOP's developed and issued to participants prior to 1 January 1982.

January..... Heavy vehicles and equipment shipped by sea--construction of essential facilities for advance parties and minimal communications completed.

Advance parties for force and unit headquarters in place prior to 15 Jan.

February..... Contingents complete predeployment training--unit deployments begin.

March..... Advance party for LSU in place 1 March--Construction of remaining essential facilities (living, mess, CP/OP's, commo sites) completed by 5 March--advance parties for operational elements in place and LSU functional by 20 March.

FIGURE 1-6

OPERATIONAL TIMETABLE (CONT'D)

March 20..... MFO in place in area of operation.

March 20 - April 10..... In place planning, training and adjustments.

April 10..... Force Commander inspects contingents.

April 15..... MFO operational.

April 20..... Command Post Exercise to test communications and reporting procedures.

April 25, 1982..... Border change. MFO assumes its functions in area of operations.

FIGURE 1-6

concentrate on the development and evolution of the logistics system that has successfully sustained the MFO for five years.

ENDNOTES

1. Peace Treaty, Israel-Egypt, 29 March 1979.
2. Protocol to the Peace Treaty, 3 August 1981
3. XVIII Airborne Corps Letter of Instructions - MFO, 2 March 1982.

CHAPTER II

LOGISTICS CONCEPT DEVELOPMENT

GENERAL

The logistics development of the MFO encompassed everything from supply, maintenance, equipment, base development, food, to mission allocation. The initial planning was the most difficult due to the number of unknowns. The list of firm planning factors available on November 2, 1981 were:

- The MFO would consist of 3,000 personnel.
- The MFO would deploy 15 March 1982.
- The MFO would initiate operations on 25 April 1982.

With the available information the logistics planning process was initiated. A generic logistics/support system was designed to permit each function to stand alone, i.e., communications support, transportation, engineer support, etc. This would permit a contingent to have a viable, well defined mission as commitments were made by the participating country. The Memorandum of Understanding (MOU) signed with each country was the contract the MFO made with each contingent for a specific mission. Figure 2-1 is a list of the MOU dates with each country.

Each contingent was to rotate on a 6-month tour of duty. This was extremely difficult for the logistical support development because of continuity of operations. This continuity was to be provided by a civilian contractor which would supplement the military support unit.

MFO AGREEMENTS

FIJI	JULY 81
COLUMBIA	SEPTEMBER 81
URUGUAY	NOVEMBER 81
NETHERLANDS	FEBRUARY 82
UNITED KINGDOM	FEBRUARY 82
AUSTRALIA	MARCH 82
NEW ZEALAND	MARCH 82
FRANCE	MARCH 82
ITALY	MARCH 82
UNITED STATES	MARCH 82

FIGURE 2-1

The use of commercial equipment, trucks, jeeps, communications equipment etc., was used on a large scale. This equipment was selected for its ease of training, low maintenance, availability and lower cost than military specification equipment. All of this was to be accomplished less than 120 days after the initial logistical planners met to initiate the development process. The following sections will discuss each area to follow the development process from concept to implementation.

EQUIPMENT

The majority of equipment was procured from commercial sources on a bid basis. The concept was to provide equipment that was easy to operate, minimum training required, easily supported through existing sources of supply and reasonable in cost. The equipment (trucks, jeeps, buses, etc.) was purchased prior to the force composition being completed. The equipment was purchased for a mission requirement and it was envisioned that the participating contingent could use the equipment with minimum training time.

The materials handling equipment (MHE) was purchased with the concept of unimproved areas, outside storage and little operator training. As the bases matured, more MHE would be purchased for inside warehouse work.

The purchase of commercial generators for the CP/OP and the communications equipment followed the same basic guidelines as has been previously discussed.

The underlying concept was for equipment that was simple, reliable, reasonable in cost and could accomplish the stated mission.

FACILITIES

The facilities discussion will be limited to the logistics facilities, although the base development program was a well executed plan for facilities construction in a remote area.

The logistics facilities planned were for a generic force with the thought of modifying existing structures and constructing specialized buildings at a later date.

The facilities were a factor during the deployment as the initial operations in that support had to be provided, yet facilities did not exist for operations. This was partially overcome by leasing warehouse and maintenance space at the port of Ashdod and some innovative measures taken by the LSU at the North Base.

There is a more detailed description in Chapter 3 of some of the interim measures taken to offset the lack of facilities. The discussion of each major class of supply will include a discussion of facilities and, in order to inform rather than bore, this facilities discussion is relatively short.

SUPPLY

The MFO supply system was to be unique in that a single source of supply was to support all Nations in their mission accomplishment. The MFO would provide support in all areas except for contingent-unique requirements such as weapons, ammo, etc. The MFO could also requisition

from the Department of Defense (DOD) supply system or procure items from commercial sources.

The design of the requisition flow was the next step and the decision was made to enter the DOD system at Camp Darby, Italy, the 201st Materiel Management Center. The 201st was to be an entry point and no supplies were to be provided from USAREUR stocks. The requisition was to be sent to the National Inventory Control Point, filled, and the material sent to New Cumberland Army Depot, Pennsylvania, for consolidation and shipment to the MFO. The shipments were to arrive in Tel Aviv, Israel, by air or Ashdod, Israel, by sea where the support contractor would clear the port and the US Logistical Support Unit (LSU) would transport supplies and equipment to the North Base.

The North Base (El Gorah) was to be the primary support center for the MFO operations. All materials would flow to North Base and subsequently to the South Base (Sharm el Sheikh). This was established to simplify flow and provide for accurate accountability. The flow to the South Base would be by linehaul tractor trailer or by air transport. There were four (4) Sector Support Sites (SSS) established within Zone C with a supply of fuel, water and rations to support the other checkpoints/observation points (CP/OP) within the area in case of resupply problems and to provide routine fuel for helicopters working in the area.

The LSU was to provide support to the CP/OP and Sector Support Sites with their organic transportation. There were approximately 42 remote sites that required support in the Zone. The LSU was to provide fuel and water to the CP/OP due to the specialized transport requirements

and the contingents were to provide all other supplies to their own soldiers. This was done to permit each individual unit to support with their own assets to their own soldiers to the maximum possible extent. This was also done to preclude a contingent finding fault with the support and thereby causing friction. This is the first time for a multinational effort to be supported from a single supply source and everything possible was done in the conceptual design stage to minimize the possible areas of conflict and permit maximum support of an individual contingent from their own resources.

Each contingent was provided a number of commercial vehicles for utilization in their mission accomplishment. The equipment will be described in a subsequent section of this chapter. Additionally, the internal supply operations are described in the following chapter in great detail.

The supply system was designed with the position of Chief Management Officer (CMO) on the staff of the Force Commander and his function was to provide the fiscal control for the Force in the budget area. The intent was to provide the Force Commander with a representative of the Director General to control the budget and provide DG input into the requisition process of materials and services.

This is how the initial supply procedures were established and the factors that influenced their establishment.

MAINTENANCE

Maintenance was a completely new concept developed for the MFO support. The concept basically stated that each contingent was responsible for operator maintenance and the support contractor would

perform all additional maintenance work. The equipment was of commercial manufacture for ease of operation, permitted use of existing manufacturer repair parts and the equipment fleet was limited in types of vehicles to mitigate the problem of parts supply.

With the purchase of the rolling equipment, trucks, buses, jeeps, the manufacturer provided a recommended list of repair parts for a 6-month period. This list of repair parts was purchased along with a "desert environment" parts package which generally included more filters, oil, lubricants, etc.

The support contractor was to provide service to the generators on each CP/OP and the radio equipment. The generator and communications equipment was of commercial manufacture and simplified to the maximum extent possible. For example, the generators had automatic shutdown for low oil pressure, overload protection, overheating to prevent major damage in case a problem did occur. Each CP/OP was provided two generators to permit 24-hour operation, to provide backup support and to permit scheduled maintenance to be performed on sites without loss of power.

The US Battalion provided tactical equipment and the support contractor provided all support for anything above operator maintenance.

The support contractor had the capability to perform any maintenance repair up to and including what the US Army would term depot rebuild. This was done to preclude the down time of vehicles and to permit onsite repair rather than having to evacuate the equipment to a depot or other maintenance facility.

The aviation maintenance was performed by each contingent and depot level maintenance was to be completed by a contract with Israeli Aircraft Industries, Tel Aviv. The naval unit had basically the same procedures with the support level maintenance performed by contract with an Israeli marine maintenance company in Eilat.

WATER

This is THE most critical planning element of the entire operation. Due to the remote, desert area of operations, survival must be assured prior to operational concerns. The initial planning for water requirements, storage, transfer, and source was a difficult situation.

The most difficult assessment was how much water must be provided for each soldier while in base camp and each soldier at the CP/OP. After much discussion with Department of the Army representatives, various US Government agencies, the United Nations representatives, and research in numerous other references, the decision was made to initially provide 10 gallons of water per day at each CP/OP for each soldier and to provide 100 gallons of water per day at each base camp (North, South) for each soldier.

The quantities are a measure greater than all calculations; however, it was felt necessary to be on the safe side of this critical commodity. During the initial operations at the CP/OP only personal rations (C-rations or equivalent) would be used to conserve water and permit the supply routine to be established. The quantity for the base camp included everything from drinking to showers, to laundry, to food preparation.

The water storage at each CP/OP was in the form of two 750-gallon

tanks which were filled by LSU personnel. Two tanks were provided to permit the cleaning of one while using the other and to minimize the probability of losing all water to an accident.

The North Camp water storage was only 250,000 gallons initially and storage was planned for a total of 750,000 gallons to permit daily use and a resource in case of water line/source problems. The South Base had over 1,000,000 gallons of storage in the area which was entirely adequate for support, however, a 250,000 gallon tank was built within the base boundaries to permit secure control of the water storage.

Emergency canned water was procured from DOD and each vehicle, aircraft, patrol, and CP/OP was to have this emergency water available. This was the 12-ounce cans sealed to look like any can of soda or beer; but, the container was made of galvanized steel to ensure durability.

(Figure 2-2)

STORAGE CAPACITIES

	NORTH BASE	SOUTH BASE	CP/OP	SSC
WATER*	750,000	250,000**	1,500	10,000
DIESEL*	320,000	110,000	750	10,000
JET A-1*	150,000	80,000	--	2,000
MOGAS*	110,000	60,000	--	750

*GALLONS

**ON BASE

FIGURE 2-2

FUEL

The fuel situation was much easier to solve than the water supply. Fuel was in adequate supply from Israeli and Egyptian sources. The requirement for daily consumption involved a detailed analysis of each item of equipment, the number of hours/miles of use per day and the frequency of use per week.

Storage at the base camps was along conventional lines with one major exception. The diesel (DFM) storage tanks provided both wholesale and retail supply. The tanks were hooked directly to the base generators, which provided electricity for the camps, and a fueling capability was provided to load diesel fuel into tank trucks for resupply to the CP/OP sites. There was a retail fuel point for diesel and MOGAS for individual vehicles provided separately at each camp. The fuel storage at each CP/OP was for the generator diesel fuel and no other fuel storage was provided. Each Sector Support Site (SSS) had a quantity of all types of fuel for routine resupply of helicopters and emergency resupply of all other fuels.

The Jet A-1 provided for aircraft was stored at the North and South airfield with some storage in each SSS. (Figure 2-2)

FOOD

Food was a critical factor in that 11 nations would be eating and each nation had its own requirements and tastes. Early in the planning process a Uruguayan officer said, "Food is food until it is prepared." You know, he's right. The same basic food is different because of preparation, seasoning, etc., so the problem quickly resolved itself.

The US Army Master Menu was used as a planning document for the initial food requirements. This would provide the basic food service structure and each contingent could then be supplemented with specific requirements such as fresh fish, tara root, wine, etc., to make each menu nationally specific. The Basic Daily Food Allowance (BDFA) for the US Army was used for the initial planning; however, this was increased to allow flexibility in menus and provided more funds for more frequent serving of special meals. This was done because there is no alternative to eating in the dining facility. Due to the remote location of the base camps, there is no alternative for meals. The meals would be prepared by the Colombian battalion, the Fijian battalion and the support contractor in the North Base and by the US battalion at the South Base.

Food preparation at the CP/OP was planned to be prepared on site by the soldiers. Each CP/OP had a complete kitchen for food preparation. The facilities will be discussed later in this chapter. The food preparation at the CP/OP was not permitted during the deployment and initial operations due to concern for water supply, sanitation procedures and training of soldiers for food preparation. A mixture of C-rations, Meal-Ready-to-Eat, and Long Range Reconnaissance Patrol rations were provided for each CP/OP. Additionally, there was a 30-day supply of prepared rations (C-rations) available for the force should the food supply be interrupted. These rations were located at the North and South base camps.

A supply of survival rations were procured to complement the emergency water discussed previously. These survival rations were to be carried on each vehicle, aircraft, patrol and stored at each CP/OP.

The procurement, transportation, storage, preparation and serving of food was not without problems in the deployment phase. Due to the facilities not being completed, an interim arrangement had to be made to store the food supplies in Ashdod at a warehouse. A cold storage facility was also leased to provide adequate storage. The preparation and serving was difficult due to the support contractor having to work under difficult conditions with few food service employees and the force deployment in full swing. This will be discussed more completely in Chapter III.

CHECKPOINT/OBSERVATION POINT FACILITIES

The facilities for the CP/OP had numerous options. The options ranged from tents to permanent structures. On a cost comparison basis the most cost effective and most desirable from a user viewpoint was a modular unit (trailer) which could be easily fabricated, easily moved, provided protection from the elements and was relatively durable. The modular units selected were 20' X 8' with one being for an operations center and kitchen area and a separate module of the same size for sleeping. The small size facilitated movement and by separating the sleeping area from the operations areas those soldiers off duty could have a quiet area in which to rest. The kitchen had a stove, refrigerator, separate freezer, sink, table and chairs. The original planning factors envisioned an 11-man squad staying at a CP/OP for a period of 7 days. These were the original planning factors.

Two 750-gallon water tanks on stands were provided to permit cleaning of one tank while another was in use and to minimize the loss of all water if one tank was damaged. Showers were not initially

provided; however, the water storage capacity was adequate to provide for showers as the sites matured.

Each site was provided two generators. The main communications relay sites were provided more powerful generators than a normal CP/OP and every generator had approximately 33 percent more capacity than initial load requirements. The excess capacity was built in to provide for expansion of power requirements for future needs. Load banks were installed on the generators until the excess capacity was needed. The generators were of commercial manufacture with automatic shut-off for overload, overheating, low oil, etc., and two generators were provided to permit 24-hour operations.

Normal barrier material was provided in the form of sand bags, concertina wire and other items to ensure the security of each CP/OP.

HEALTH, WELFARE, MORALE SUPPORT

This area took many different forms. The initial planning was not detailed in the area due to the severe time constraints of force development, force deployment, initial operations and facility completion. The planning included sports programs, a movie theater, a swimming pool, unit clubs, a force exchange and trips and tours to local Egyptian and Israeli cities and tourist attractions.

Support Contractor

The initial support contractor was selected on a bid process with a number of competent, national firms submitting proposals. The support contractor selected was E-Systems of Greenville, Texas. The support contractor had a difficult task in that much of the work was not

specific and the work requirements evolved over a period of time. The support contractor was to provide continuity to the force support system and provide flexibility as a alternate source of supply for the DOD system. The flexibility was provided by requiring a new service or task to be performed and then providing the funding to the support contractor to accomplish this. The flexibility was provided by the use of local procurement in Israel and Egypt with support contractor representatives or by utilizing the corporate buying system at the home office.

The initial phase of deployment and start-up operations were especially difficult for the support contractor and the LSU because of the lack of facilities, equipment, procedures and numerous other reasons, but there was no acceptable alternative. This area is discussed in detail in Chapter III.

CHAPTER III

INITIAL OPERATIONAL PLANNING AND EXECUTION

In November 1981, the requirement to provide a light infantry task force and a logistics support element was passed to Department of the Army. Subsequently, for any number of logical reasons, the mission was given to the XVIII Airborne Corps. It is only conjecture at this point; but, it appears safe to assume that the airborne corps was chosen because of its reputation, its traditional link with potential conflicts in Southwest Asia, and its readiness posture, given the fact that all planning, preparation, and deployment would have to be completed in 120 days or less. The mission was regarded as highly sensitive because of the political overtones and the potential that factions opposed to the success of the Camp David Peace Accords might attempt to intervene in some way. The sensitive nature of the information, classification, and compartmentalization made initial planning difficult.

The commanding general, XVIII Airborne Corps, further tasked the MFO mission to the 82nd Airborne Division, Fort Bragg, North Carolina, to provide a light infantry task force, augmented with an aviation element capable of operating and maintaining ten helicopters. In addition, First Corps Support Command (1st COSCOM), also located at Fort Bragg, was tasked to create, man, equip, and deploy what was then referred to as a Logistics Support Element. The name of this element was later changed to Logistics Support Unit to deconflict with Maison Section- Egypt. Although the name was not changed until after deployment, we

will refer to the logistics element as the Logistics Support Unit (LSU). Both the infantry task force and the logistics unit would serve six months with MFO and be replaced by like units at the end of that period.

The 1-505th Infantry Battalion, 82nd Airborne Division, commanded by LTC Bill Garrison, was selected as the base unit for the light infantry task force, to be referred to as USBATT (US Battalion) by MFO. The 1-505th was to be augmented by an aviation element, military police section, beefed-up communications section, and by additional supply and maintenance personnel. The LSU was not an existing unit and it was the task of 1st COSCOM to create a unit to assume the mission to:

provide combat service support to all national contingents of the Multinational Force and Observers, to include: supply, transportation, maintenance of US peculiar communications and small arms, movement control, finance, postal, medical (if not provided by France), explosive ordnance disposal, and graves registration.

It was now late November and the force had to be in place not later than 15 March, ready to assume the mission. Time was of the essence---only slightly more than 100 days remained.

FORMING THE LSU

As the first step in formation of the Logistics Support Unit, the Commander 1st COSCOM, COL Bill Richardson, selected LTC Jim Wright to create the unit, man it, train it, equip it, deploy it to the Sinai, and to command it in its logistics mission there for 6 months. In addition to that and the specific support mission, an initial ceiling of not more than 440 soldiers was imposed and authority was given to select the best soldiers available in 1st COSCOM. Guidance was given to go out of 1st COSCOM only to fill those positions for which skilled personnel were not

available in COSCOM units.¹ The timeframe--latter days of November. Work began in earnest.

A planning cell was immediately formed, consisting of the selected LSU executive officer, Major Martin Speicher, who would be in charge of planning, the Logistics Operations Officer, and a personnel noncommissioned officer. This group established a "strawman" table of allowance for personnel, which was tailored to provide the support required by the MFO mission statement. In addition, the planning group developed a list of standard US Army equipment that would be required to accomplish the mission, including tactical vehicles, materials handling equipment, fuel system supply points, recovery vehicles, and line-haul tractors and trailers. The equipment list, along with the table of allowance for personnel, was forwarded to XVIII Airborne Corps and Department of the Army for review.

During the week to ten days that followed, selections of key personnel were made and the process of screening/selection for other positions began. The guidance given by the 1st COSCOM commander to select the best soldiers available and his support in resolving conflicts were critical at this stage of the operation. LSU planners and company commanders were allowed to screen personnel records to select the best qualified people available with at least one year's retainability. The quality of the soldiers selected would pay off a thousand times later in the operation. The unit began to take shape, faces were put with spaces, and essential personnel were released to begin full-time duty with the LSU. Other personnel would have to be brought on board incrementally, as training and deployment processing

required, to prevent undue degradation of 1st COSCOM's many other mission requirements.

At this time, guidance was received from XVIII Airborne Corps that the personnel ceiling would be reduced to 356 LSU personnel. In addition, it was indicated that this was made possible by an MFO decision to have a civilian contractor provide some logistics support, including maintenance above operator level. It was further indicated that the logistics unit would not deploy with tactical US Army equipment, but, would be issued commercial equipment on arrival in the Sinai. Because of the reduced personnel ceiling and the ambiguities that were surfacing about the mission, equipment, facilities, and force composition of MFO, a renewed effort was made to ensure that personnel selected were multitasked. Selections included drivers with prior experience as mechanics, warehousemen and customer service clerks who were multilingual, soldiers who had been carpenters, electricians, and those who had a reputation for doing tough jobs, regardless of skill required, under pressure. These selections allowed the unit that would eventually deploy to become extremely flexible, self-sufficient, and creative in regards to improvised support. It is these characteristics that were so critical to survival of the MFO in the early days.

As key people joined the logistics unit, more questions regarding the nature of the mission, force structure, equipment types and densities, requisition procedures, authorized stockage lists, transport requirements, and hundreds of other issues surfaced. In effect, the mission became more ambiguous the more closely it was analyzed. At this critical juncture, the MFO logistics planners hosted a planning meeting in Washington, D.C., on 21 December 1981. This meeting was critical in

a number of ways. First, it allowed a face-to-face exchange between the planners at MFO and the operators of the LSU. The logistics concept was explained, questioned, and refined. The LSU organization was fine-tuned and approved. Equipment densities were clarified and use of commercial, off-the-shelf equipment was detailed. The role of the civilian support services contractor was discussed, along with the anticipated LSU/contractor interface. Details of deployment were presented. Authorized stockage lists were discussed. The results of the session exceeded expectations and surfaced the criticality of the need for direct communications between MFO logistics planners and the LSU staff.

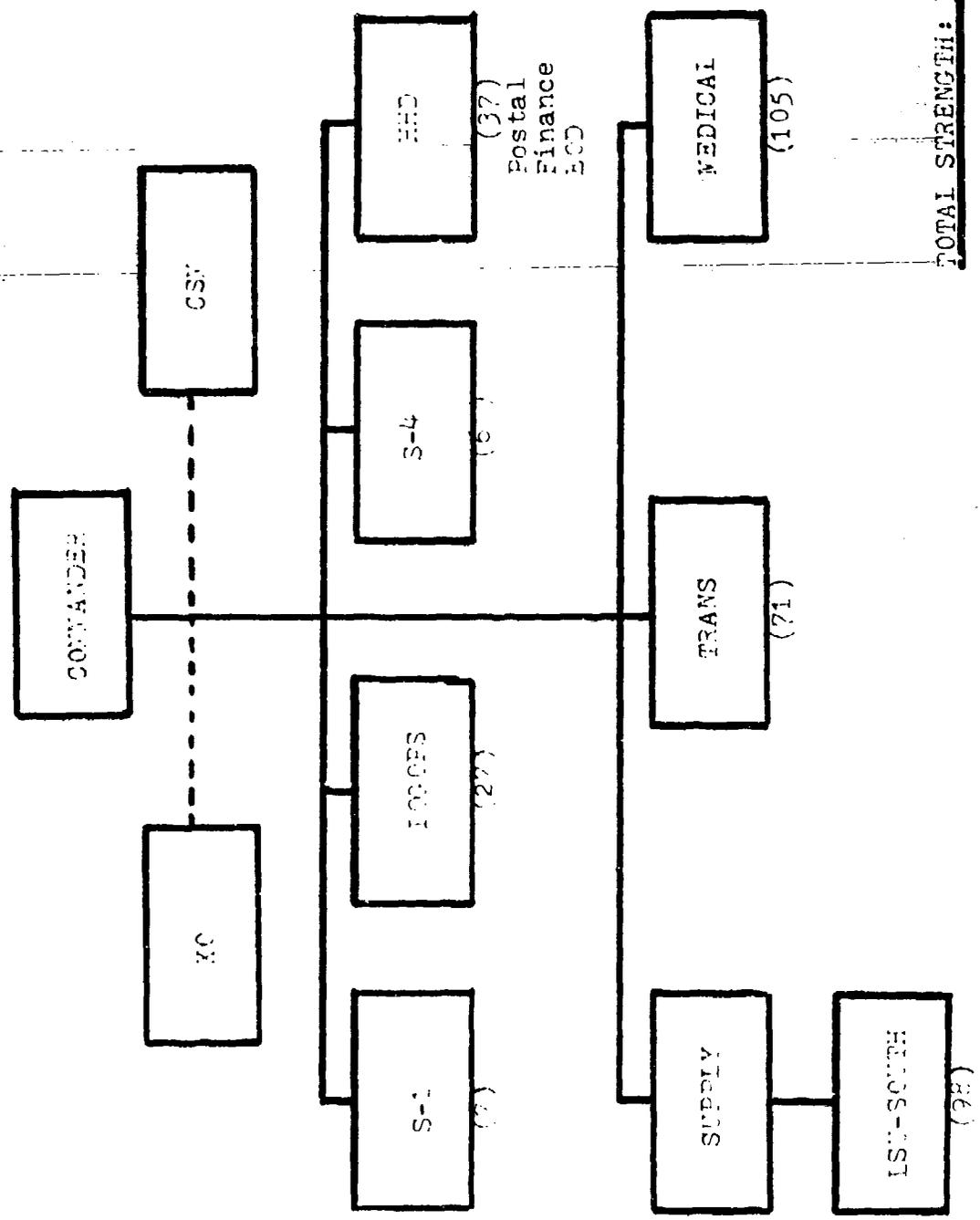
As a result of the logistics meeting, three actions were taken in regard to planning and improved MFO/LSU communications. First, a direct interface between the MFO and LSU, without going through the layers of Army staffs, was requested by MFO and approved by Department of the Army. LSU also attached a liaison officer to work with the MFO logistics staff full time until deployment began. And, finally, a cell of logistics planners from the LSU logistics operations center was sent to MFO Headquarters to work with LTC Joe Creel and the logistics staff on critical support issues, such as development of a Department of Defense/MFO supply interface, authorized stockage lists, consumption data, and logistics operations concepts. This close working relationship proved to be key to the effective support of the force, particularly given the extremely short planning time, which by now was beginning to exert terrible pressure on the MFO logistics staff and the LSU.

THE DEPLOYMENT PHASE

The organization of the LSU was firmed up (Figure 3-1) and commercial equipment authorizations were specified (Figure 3-2). The task now was to prepare the LSU for deployment. It soon became apparent during this stage that direct contact with Department of the Army and MFO headquarters was critical to accomplish the predeployment schedule. 1st COSCOM, XVIII Airborne Corps, and FORSCOM headquarters were bypassed and LSU staff members dealt routinely with points of contact in Washington, D.C. There was a wide assortment of predeployment preparation problems to be solved, particularly in the personnel area, such as deletions from orders, extensions, etc. The most difficult problem was processing all members of the unit for issue of official passports. This was a bureaucratic, complex, time-consuming process and great effort was expended in tracking down documents and hand-carrying passports applications between Washington, D.C., and Fort Bragg. Administrative processing requirements were extensive; but, were handled professionally, given the short suspense requirements.

Extensive training was conducted by XVIII Airborne Corps and LSU soldiers received detailed briefings on the mission, the treaty, the Arab culture, safety, the desert environment, personal hygiene, and rules of engagement, to name several subjects. In addition, family members were briefed as thoroughly as possible, considering constraints on classified information. Spouses were provided with complete information packets and a family support structure was established to provide a "family chain of command" to solve problems at home. This

LOGISTICS SUPPORT UNIT



TOTAL STRENGTH: 356

FIGURE 3-1

LSU EQUIPMENT LIST

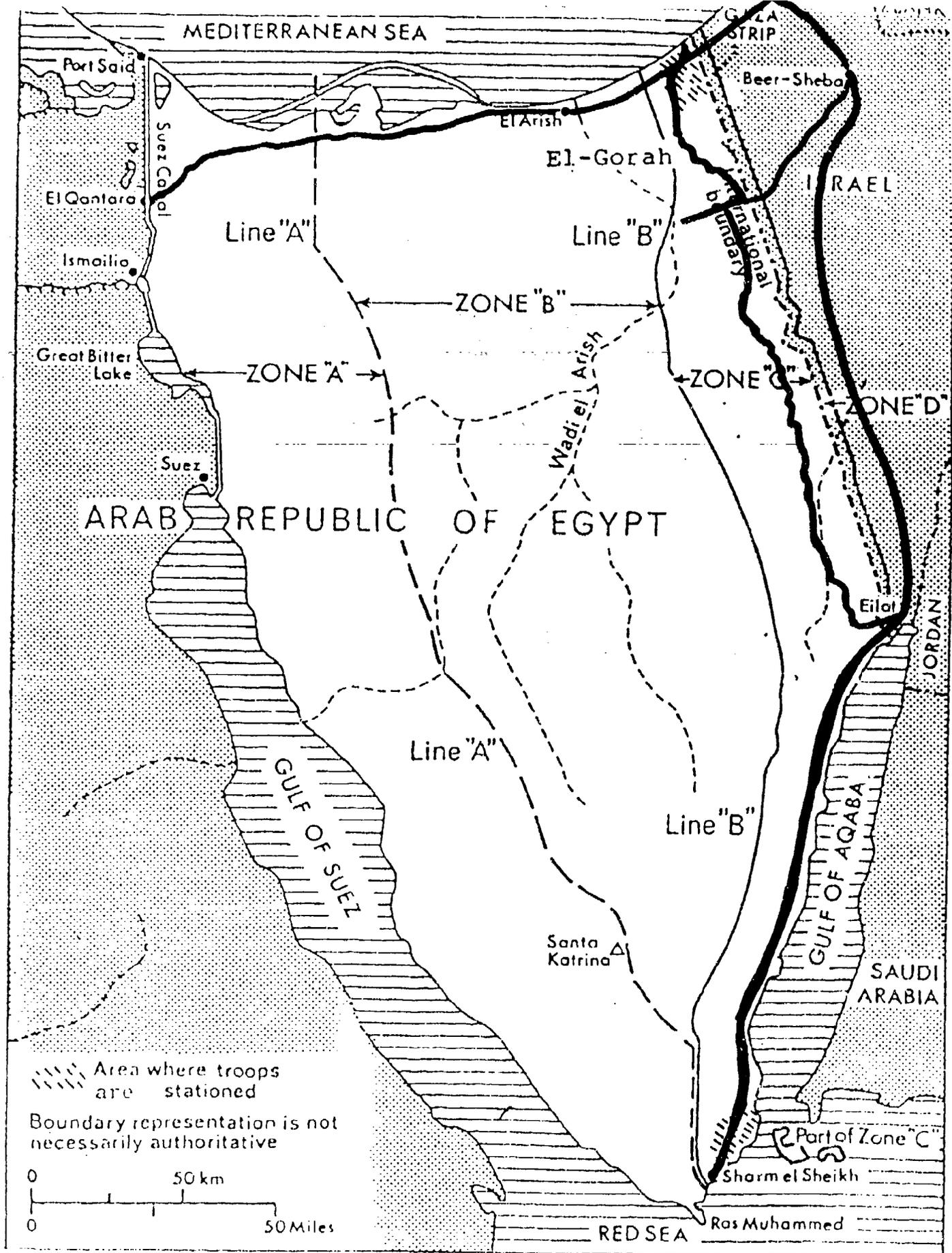
Semitractor.....	12
Truck, 2 1/2 T (4X2).....	2
Tank Truck, Water 1,600 Gal.....	8
Tank Truck, Fuel 1,600 Gal.....	8
Truck, Refrigerated 20 Ft.....	2
Ambulance, Light.....	3
Ambulance, Heavy.....	2
Jeep, CJ7.....	12
Trailer, Flatbed 40 Ft.....	2
Trailer, Lowboy 40 Ft.....	2
Trailer, Water 5,000 Gal.....	6
Trailer, Fuel 5,000 Gal.....	3
Trailer, Fuel 8,000 Gal.....	3
Van, Dry Bulk 40 Ft.....	4
Trailer, Refrigerated 40 Ft.....	2
Bus, 53 Passenger.....	4
Truck, Flatbed 5T.....	10
Tank Truck, Aircraft Fuel 1,600 Gal.....	1

FIGURE 3-2

family support structure was essential and worked well during the six months that the LSU was deployed.

In February, 1982, MFO hosted a final coordination meeting in Washington, D.C., for all contingent commanders. The meeting was the first opportunity for the commanders of the various units comprising the force to discuss the mission and share views. There were surprisingly few unresolved issues and the enthusiasm of the contingent commanders was a clear indication that each participating nation had selected its best for the mission at hand. The meeting was followed by a site survey to the Sinai. Accompanied by the Force Commander, General Fredrik Bull-Hansen, Norway, and the Senior Operations Officer, COL Ole Rohning, the contingent commanders visited both base camp locations, were updated on facilities construction, and visited the candidate locations for observation posts, checkpoints, and sector control centers in the desert. Final locations were confirmed based on operational suitability² and logistics supportability. Two clear concerns surfaced as a result of the site survey. First, it was obvious that facilities construction was seriously behind schedule and that initial deployment would be under austere conditions.³ This would be a major problem in logistics support early in the mission. And, second, logistics distribution would be impossible unless the main supply route within Zone C was improved. Figure 3-3 shows the MSR. The Corps of Engineers was tasked to construct/improve the desert road. Road maintenance would be a daily concern and continuous problem throughout the deployment period.

Deployment of the LSU was tailored to fit anticipated mission requirements. For example, drivers and command and control personnel



PICTURE 3-3

deployed early to establish operations and train on commercial equipment. The deployment schedule is at Figure 3-4. A small advance party, comprised mainly of logistics operations staff, was the first element deployed. Departing on 15 February 1982, their mission was to visit the 201st Materiel Management Center at Camp Darby, Italy, to develop points of contact and to firm up procedures that would provide an interface for MFO, through the MMC, to the DOD wholesale supply system. In addition, they visited port facilities at Ashdod, Israel, the MFO port of debarkation, and took necessary actions at North Base Camp to ensure an orderly arrival of the first increment of LSU soldiers. On 2 March, the first increment, under the control of the LSU executive officer and consisting primarily of personnel from the battalion staff and Transportation Company, departed Fort Bragg. The final increment arrived at North Base Camp on 15 March to complete the LSU deployment process.

INITIAL OPERATIONS

The North Base Camp at the time of LSU deployment was virtually a construction camp. The Army Corps of Engineers and civilian contractors were frantically pursuing a construction schedule that was already painfully in arrears. To further congest the area, the Israeli Air Force was still in the process of withdrawing from the base for eventual turnover to the MFO. Extremely security conscious, the Israelis imposed some rather stringent controls on access to areas and facilities still occupied by Air Force personnel, even in cases where facilities

LSU DEPLOYMENT SCHEDULE

Advanced Coordination Element..... 9 February
Advanced Party (25).....15 February
First Increment (98)..... 1 March
Second Increment (109)..... 8 March
Third Increment (117).....14 March

FIGURE 3-4

transfers were imminent. In effect, these controls segmented the camp, making travel, coordination, and the settling-in process very difficult.

Since the construction schedule was lagging behind, LSU billets and administrative buildings would not be completed for 6 to 8 weeks after arrival of the unit in the Sinai. In the interim, LSU soldiers were billeted in four-story Israeli dormitories, with six soldiers occupying rooms built for two and in many cases sleeping on the floor. Each of the company commanders set up company headquarters in his room during this period. The LSU commander, executive officer, and logistics operations officer occupied a three-bedroom duplex house, formerly Israeli family housing, that was to be renovated for officer housing. This duplex became the LSU headquarters,⁴ as well as commander's quarters, until the LSU headquarters building was completed and signed over in mid-June--four months after the unit arrived. The living conditions were crowded and austere and soldiers endured these hardships without complaint.

The LSU adjusted quickly to the conditions encountered during the initial weeks of the mission and soon faced the prospect of having to begin supporting the force as contingents began arriving within two weeks after arrival of the LSU. Without facilities, mission or administrative, without supplies, and without the luxury of time to get established, the LSU was asked to help in the transition of arriving contingents by moving furniture, erecting wall lockers, and doing an assortment of manual labor tasks. These projects were done with enthusiasm. In addition, commercial equipment purchased by MFO for issue to the force arrived at the port of Ashdod. Since the LSU constituted the only labor force available, it assumed the mission of

receiving, inspecting, deprocessing, driving to the base camps, and issuing all equipment for the force. To assist, MFO rented a secure truck lot at the Mack Truck Plant in Ashdod and the LSU set up a processing station there to account for and deprocess over 500 pieces of equipment. This process, under the supervision of the property book officer, continued for 4 to 6 weeks. LSU soldiers drove the vehicles to the desert and issued them to contingents in accordance with a distribution plan developed by the force staff.

I feel it worthy to note at this point that the LSU was an ad hoc battalion, with no prior experience working together, no cohesive bonds, manned by soldiers who barely recognized their chain of command. In fact, the first time the battalion stood together in formation was after deployment to the Sinai, only days before heavy support requirements began. In spite of this, their performance was magnificent. It is their enthusiasm, willingness to work, and "can do" attitude during the early days that established the unit's reputation for the remainder of the deployment period. They developed a bond born of hardship.

FACILITIES

The delay in completion of construction of facilities proved to be the most serious challenge to overcome in providing logistics support to the force. The problem with billets and administrative buildings has already been mentioned. Because the engineers put a high priority on troop welfare facilities (and rightfully so), the construction of support facilities was even further behind schedule. The delay impacted primarily on the civilian support contractor and the LSU. Of particular

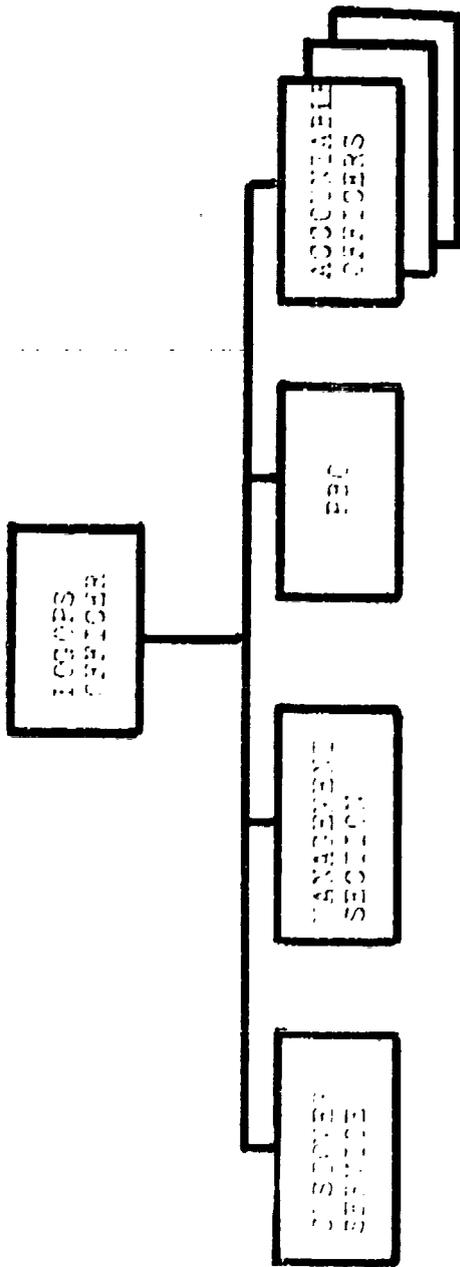
importance to the LSU were construction of the North Base Camp warehouse, including refrigerated storage, the South Base Camp warehouse, medical clinics in both camps, retail fuel points in both camps, water storage tanks in both camps, battalion and company headquarters in the north, and petroleum storage tanks in both base camps. In most cases, these facilities were not available until mid-June, and in some cases (fuel and water tanks) were not available until after the first LSU had redeployed to CONUS. The net effect is that logistics support required creative approaches and extraordinary efforts to compensate for lack of facilities. Ingenuity and perseverance made it work. Creative approaches that were required to compensate for a lack of facilities will be discussed throughout the remainder of the chapter.

Two other facilities problems are worthy of brief mention. Since LSU weapons arrived 6 to 8 weeks before the arms room was completed, the unit's weapons were placed in a CONEX container and required 24-hour-a-day security, a drain of manpower. Facilities were also required for performance of the LSU's US-only mission of providing postal and finance support. Lack of postal or finance facilities resulted in the postal NCO sleeping with a money belt on and a .45 caliber pistol under his pillow and the finance officer placing \$400,000 in a field safe in his quarters and providing a 24-hour armed guard. This situation existed for 6 to 8 weeks.

MATERIEL MANAGEMENT

The materiel management function was performed by the Logistics Operations Section (Figure 3-5). Logistics Operations was comprised of

LOGISTICS OPERATIONS



accountable officers for the various commodities who were responsible for maintenance of manual stock records and receipt, issue, and storage operations. Each accountable officer had developed an authorized stockage list for his class of supply, obtained approval from MFO, and had submitted requisitions prior to deployment through the 1st COSCOM MMC, using an MFO-unique DODAAC and UIC, with a "ship to" address in the Sinai. The authorized stockage lists were "best-guess" efforts based on anticipated consumption by equipment density, troop density, or environmental conditions. Of these, repair parts was the largest ASL, supporting the tactical vehicles issued to USBATT (Figure 3-6) and US peculiar small arms and communications, along with a large number and variety of commercial vehicles. The parts packages for the commercial equipment were quite extensive and were procured at the time the equipment was purchased. Altogether, all classes of supply included, there were approximately 10,000 line items to be managed. The problem becomes quickly obvious---management of an ASL of this size using manual stock record cards is very difficult. To further complicate matters, stock record clerks, accustomed to the Army's automated systems, had to be retrained to maintain manual stock record cards. Basically, the management system was similar to that of the Army in the 1960's. This system was necessary because of the immaturity of the area of operations, lack of communications capability, lack of facilities, and lack of automated hardware and software to manage by machine.

The supply system to be used by the force was developed by MFO logistics planners to provide maximum flexibility for support. The DOD wholesale system was to be the cornerstone of the system, providing for the bulk of MFO needs from existing stocks in CONUS depots. There also

USBATT EQUIPMENT LIST

Helicopter, Utility UH1H.....	10
Truck, Cargo 2 1/2T 6X6.....	10
Truck, Cargo 2 1/2T 6X6 w/winch.....	12
Truck, Utility 1/4T m151.....	30
Truck, Cargo 1 1/4T M880.....	29
Truck, Ambulance 1 1/4T.....	3
Drum, Fabric Collapsible.....	20
Generator Set, 1.5 KW.....	4
Generator Set, 3 KW.....	6
Generator Set, 7.5 KW.....	3
Generator Set, 30 KW.....	2
Trailer, Cargo 1/4T.....	30
Trailer, Cargo 3/4T.....	29
Trailer, Cargo 1 1/2T.....	17
Trailer, Tank, Water.....	6
Truck, Forklift 4,000 LB.....	1
AN/TVS-4.....	1
AN/PAS-6 Night Vision Sight.....	1
Radio Set, AN/PRC-77.....	22
Radio Set, GRC-160.....	3
Antenna, AT-784.....	9
Receiver Set, Radio AM/PRR-9.....	48
Transmitter Set, Radio AN/PRT-4.....	34
Tool Set, Aviation Maint #1.....	1
Tool Set, Aviation Maint #2.....	1
Assorted Aviation Tool Sets.....	40

was a cost advantage here because, in most cases, DOD items could be had cheaper than they could be obtained through procurement by MFO. It was also believed that the response time provided by the DOD system would suit the needs of the force in the Sinai. So, MFO became a customer of DOD, with a unique DODAAC and UIC, reimbursed by MFO for the costs incurred in providing supply support. The DOD wholesale system was augmented by procurement from civilian sources. MFO had already had extensive experience in purchase of commercial equipment, tools, equipment to support observation posts and checkpoints, and items to be sold in a civilian contractor-operated force exchange store. There were some distinct advantages of buying commercially in that off-the-shelf items could normally be procured and shipped when there wasn't sufficient time to use the requisition system. DOD supplies were consolidated and containerized at New Cumberland Army Depot, which was designated as the Consolidation Containerization Point for all DOD shipments for MFO. New Cumberland Army Depot would then ship containers destined for MFO to a freight forwarder at Baltimore, hired by the MFO to forward both DOD shipments and commercial shipments via cargo ship from Baltimore to Ashdod, Israel. Problems with the freight forwarder will be discussed later in the chapter.

The Logistics Operations Section was also responsible for accountability of nonexpendable items received by MFO and issued to force contingents. This was accomplished by a small property book section, headed by a supply warrant officer. The workload of this section, beginning with the issue of equipment through the deprocessing operation at the Mack Truck Plant in Ashdod, was overwhelming. Accountable items began arriving so fast and in such quantities that the

property book section was augmented with additional manpower to handle the workload. Some examples of type items are:

- o Sets, kits and outfits for use by the civilian contractor in both base camps.
- o All components of the observation post/checkpoint operations.
- o Dining facility equipment.
- o Vehicles, materials handling equipment, and construction equipment.

Like the accountable records, the property book was manual and the process of vouchering receipts, preparing hand receipts, and posting property book pages created a huge backlog. Compounding this, separate property books would be required for MFO and for equipment issued to USBATT. This problem was worsened when the Sinai Field Mission, an early peace treaty observation group located in Zone A, withdrew and transferred all of their equipment to the force in Zone C. This equipment was inventoried by the property book officer onsite in Zone A and then trucked by LSU trucks to Zone C. There were approximately 40 containers, stuffed with equipment, dropped on the force over a 2 to 3 week period. It would take months to issue and account for this property.

The supply procedures used were also developed specifically by the MFO in an effort to simplify and standardize supply forms and records. Once again, the Army supply system served as the basis for administrative supply records and procedures. Basically, US Army forms and records were simplified as much as possible and MFO form numbers were assigned. Standard operating procedures (SOP) for supply was written and published by the MFO staff, in conjunction with the LSU and

force logistics staff. The SOP standardized supply procedures that were applicable to all contingents. Of course, these procedures were totally foreign to supply personnel from the vast majority of the supply operators in the various force contingents and it was necessary to provide training in these "new" procedures as quickly as possible. LSU provided this training. The Logistics Operations Section was responsible for this task and developed a very detailed, easy-to-understand supply course which was given to all contingents. Here, once again, the flexibility built into the LSU paid dividends. Because an effort had been made to select multilingual personnel, the course was also offered in Spanish. This was especially important for Uruguayan and Colombian contingents, whose proficiency in English was not sophisticated enough to grasp the logistics language in English. This was a very successful program and essential in establishing a baseline of standard procedures. As an additional step in helping the various contingents to operate in the MFO logistics system, the LSU assigned permanent liaison personnel to each contingent to interface with the customer service section of the Logistics Operations Section. In most cases, the liaison personnel spoke the language of the contingent to which they were assigned. This system worked beautifully and made support of this coalition of nations much easier and more efficient. The concept also created tremendous rapport between the LSU and its multinational customers and was a giant step forward toward MFO force cohesion. It was the only way that such a nonstandard system could possibly work.

THE REQUISITIONING PROCESS

Like the logistics system, the requisitioning process was unique to MFO, with no precedent as a guide. The process is graphically portrayed at Figure 3-7, but, deserves some additional discussion. The flow of supply requests at North Base was from the customer direct to the customer service element of LSU Logistics Operations Section. South Base contingents submitted requests through the LSU South Detachment to the Logistics Operations Section if items were not in stock at the South Base warehouse. Customer service would edit requests and forward them to the appropriate class of supply accountable officer. The accountable officer would either release the item for issue, if in stock, or prepare a stock replenishment requisition to be consolidated with requisitions from other accountable officers for review by the Logistics Operations management section. After review, the consolidated list of requisitions, including requisition number, item description, quantity, unit price, and total price, was forwarded to the Chief Logistics Officer on the force staff for review. He would approve or disapprove items on the list and forward the request to the Chief Management Officer on the force staff for approval of funding. The consolidated list would then be returned to the Logistics Operations Officer, who would prepare an updated listing of approved requisitions. This list would then be sent via telex by a Dutch signal operator to 201st MMC, Camp Darby, Italy, for transceiving via Defense Automated Addressing System (DAAS) to CONUS NICP's. Non-DOD item requests and local purchase requests were handled in the same manner, except the approved items list

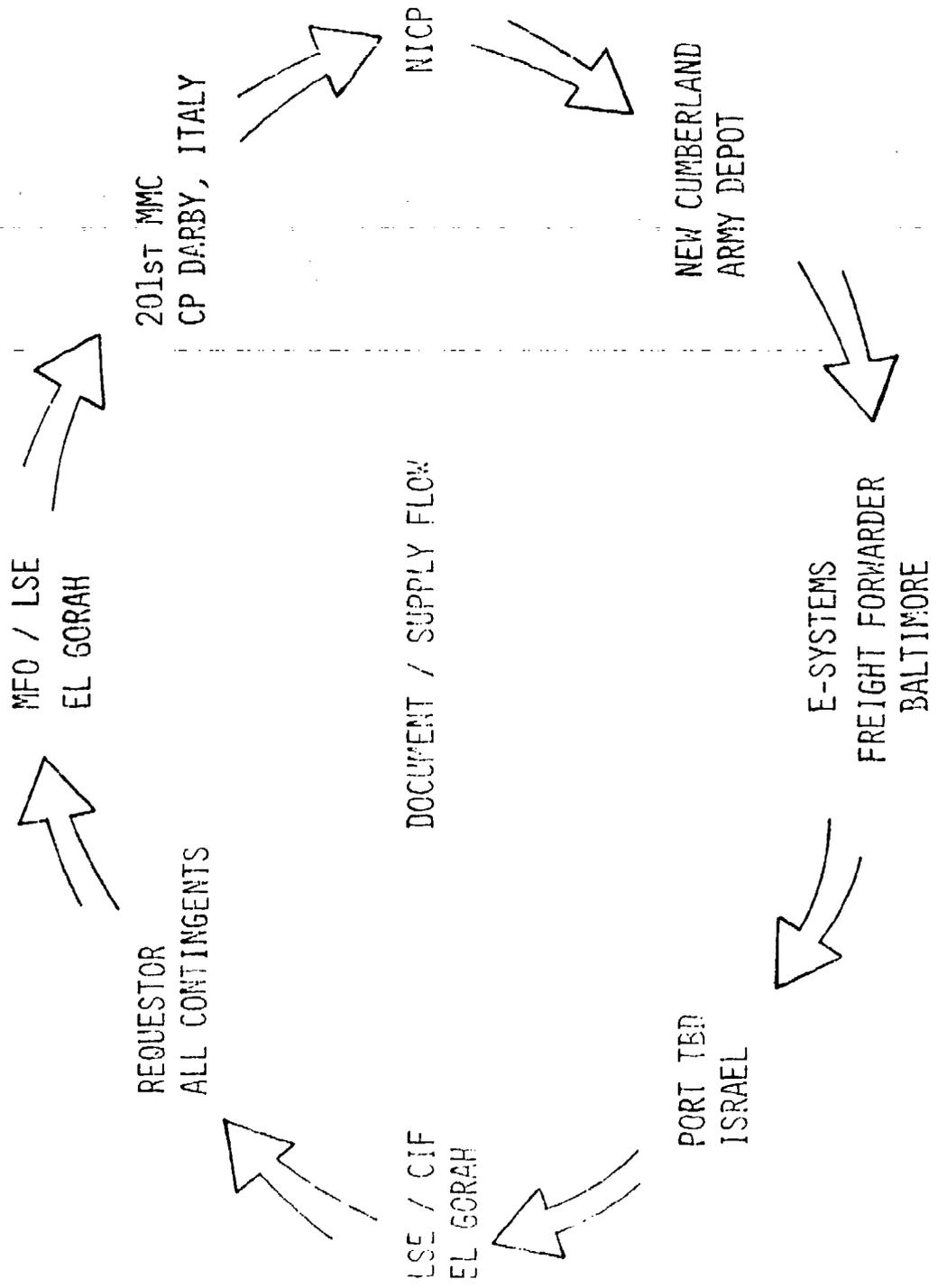


FIGURE 3-7

was forwarded to "E" Systems for procurement action either from a local (Israeli or Egyptian) source or from CONUS.

There were many problems associated with this system, which, by way of explanation, was created to control expenditures during the initial year of operation and to prevent abuse of the system. The processing of requisitions through so many levels of management took 45 to 60 days from the initiation of a request until the final telex request was sent to Italy. This, in effect, extended order ship time to an average of over 180 days. This also meant that a contingent on a 6-month rotation was requesting items that would be received by the next rotational contingent. In addition, 85 to 90 percent of requisitions submitted were high priority due to the long order ship time and poor asset position of authorized stocks in the Sinai. The Army, quite naturally, was concerned with the density of high priority requests from MFO and requested controls be established. In spite of good intentions, the crisis nature of early operations did not allow a substantial decrease in high priority requests.

Of concern to the 201st MMC was the significant effect of MFO requests on resultant DOD supply management data. As an example, when 201st MMC transceived MFO requests, the Julian dates were already 45 to 60 days old because of the processing system. When DOD management statistics were published, the 201st MMC processing time was ridiculously high, as were its high priority request figures. Finally, there was incompatibility between the automated system at the 201st MMC and the manual system at the LSU. This was particularly acute in the editing and reconciliation processes. Because of telex errors, MFO requisitions could not be machine edited and had to be managed off line.

Errors were reconciled by telephone. Due-in reconciliations also required off-line management and were done manually. The procedure was for customer service personnel from the 201st MMC to meet LSU accountable officers in Tel Aviv (they were not given access to the Sinai--a political problem later resolved) for a line-by-line, requisition-by-requisition reconciliation. The system was inefficient and made sustainment of a continuous flow of supplies to MFO very difficult. Once again, extraordinary efforts were required to overcome these difficult constraints that were a result of an immature operation.

A final word about the requisitioning process. To expedite the process, extensive local purchase was used until the flow of supplies from CONUS could be stabilized. The LSU Logistics Operations Officer was provided with a revolving fund of \$2,000 for purchase of emergency health and welfare supplies, primarily cleaning materials, soap powders, mops, brooms, etc. Most items, however, that were provided by local purchase came from the "E" Systems purchasing agent in Tel Aviv. There were substantial quantities of supplies local purchased during initial operations because every request met the "emergency" provisions of local purchase requirements. There was considerable "crisis" management and the supply system was forced to respond.

RECEIVING SUPPLIES

As supplies began to arrive by ship at the port of Ashdod, the facilities problem in North Base Camp became critical. Although the LSU had occupied a small warehouse turned over by the Israelis, it was not large enough to accommodate the large amounts of supplies that were

being belched out of the cargo ships at Ashdod. What was needed was a central receiving and break-bulk facility in Ashdod. As a result, the MFO logistics staff directed the civilian contractor to lease facilities at Ashdod to serve this purpose. "E" Systems, the support contractor, subsequently rented a large fruit warehouse near the port for dry cargo and a frozen food facility at the "Birdseye" Frozen Food processing plant at Ashdod. These facilities would serve as the repository for the bulk of supplies until completion of LSU storage facilities at North Base Camp in July.

The leased facilities solved the immediate problem of storage space, but, created other problems. Because of the limited storage capacity at North Camp, more transportation runs to Ashdod, about three hours one way from the base camp, were required.⁵ In addition, operation of these facilities was not programmed and it became necessary to station LSU personnel TDY at Ashdod to operate the warehouse and perform veterinary inspections on perishable food items. Segregation and identification of items also became difficult because the volume soon began to exceed the storage capacity of the warehouse. It was common for Sea/Land containers to be stacked in the open storage area adjacent to the fruit warehouse and unloaded when space became available. This made visibility of supplies difficult and it required frequent "searches" throughout the warehouse to find critical supplies and equipment. Every day was "Christmas" during this period.

Identification of critical supplies was not only a problem in the warehouse. Because MFO used a freight forwarder, not the DOD military transportation system, there was no in-transit visibility or shipping data available. Supply managers were not able to monitor the shipping

status of supplies and to forecast arrival of critical items. Every ship that docked was a "surprise package." This problem was made worse by the "mixture" of supplies; commercial parts were mixed with tactical parts, authorized stockage list items were mixed with items for the force exchange operation, and there was no system to identify who was to be issued accountable items. Extraordinary efforts were required to sort all of this out and continuous problems were encountered with customers who inquired about the status of supplies. Finally, it was discovered three months into the operation that the freight forwarder did not recognize the DOD priority system and that high priority items were handled routinely along with other supplies. This was a difficult and frustrating experience and required the understanding and cooperation of all in the logistics community. We called this attitude "calm professionalism." Somehow, the mission was accomplished in spite of this situation.

SUBSISTENCE SUPPLY

In general, subsistence supply posed the fewest difficulties among all logistics support functions. It can also be said that the quantity and quality of food available was a major factor in shoring up morale of MFO soldiers during early operations. As discussed in Chapter 2, the MFO staff developed a subsistence resupply system, relying primarily on the DOD wholesale supply system and supplemented by commercial procurement. This proved to be a most effective system. In addition, the selection of food items was based on the Army Master Menu, supplemented by items purchased to satisfy particular national preferences, for example, wine for the Italian contingent, fresh fruit,

fish, and Tava root for the Fijians, etc. This concept worked exceptionally well and the problems that were encountered were caused primarily by a lack of storage facilities at the North Base Camp.

A substantial cold storage capacity was designed to be constructed in the spacious North Base Camp warehouse. It has already been mentioned that these facilities were not available until June and that, to compensate for the delay, MFO leased warehouse space (cold and dry storage) in Ashdod. It was therefore necessary for LSU trucks to travel to the Ashdod warehouse facilities daily to pick up rations for delivery to the Fiji, Colombian, and International dining facilities in the north and the USBATT dining facility at south camp. Early each morning two 40-foot refrigerated trailers and two 40-foot box trailers made the trip to Ashdod to pick up rations--an all day round trip. One of the trailers that picked up dry rations was dispatched from Ashdod to South Base Camp, over 250 miles, and the remainder of the trucks returned to North Base Camp and delivered to the three supported dining facilities. The following day, frozen food would be loaded on the French C-160 Transall for South Base and the process would start over again. This system quickly became burdensome and there was considerable concern that there were no rations stored in the base camp to support the force if trucks broke down or if the ration distribution run could not be made for some reason. Basically, the margin of safety was just too close for comfort and the solution arrived at by the force logistics staff was to rent eight refrigerated containers to provide some backup storage capacity. This relieved much of the pressure on the LSU; however, ration distribution was not normalized until the completion of the cold storage facilities.

The other problem in the subsistence area occurred because actual consumption exceeded planned consumption and caused a faster depletion of stocks than had been programmed. The force staff detected that the Basic Daily Food Allowance for rations was in the \$6 range, as compared with the planning factor of \$3.85 per man/day, the standard US Army figure. As a result, additional food stocks were procured and the force staff developed and implemented ration control and accounting procedures for the dining facilities, along with a dining facility inspection program, to monitor food preparation and administrative procedures.

FUEL

The fuel mission of the LSU was to provide retail fuel service at both base camps, to operate bulk fuel storage facilities at both camps, and to provide delivery of motor gasoline and diesel to the 42 observation posts and checkpoints and four sector support sites. Retail fuel operations were accomplished primarily by using 55-gallon drums and the 1,200-gallon fuel trucks as tankage. In addition, the Corps of Engineers had some available above ground storage capacity that they provided to LSU to operate for retail fuel support. Support was provided in this manner until modern retail filling stations, with ample underground storage, were completed and became operational in May in both base camps.

This support was also augmented by use of fuel coupons purchased from PAZ Oil Company in Israel. However, the coupons could only be used on the Israeli side of the border. The biggest problem in the fuel support area was the lack of sufficient tankage at either base camp to provide storage for motor or aviation gasoline. Although sufficient

tankage was designed and was under construction, it was not completed and available for use until after the first LSU had redeployed to CONUS. The one exception is that the diesel bulk storage tanks were completed and provided sufficient storage to satisfy diesel requirements. These tanks were completed early because they were used to provide fuel directly to the power-generating station, as well as to provide bulk diesel storage. This was an ingenious idea developed by MFO staff planners to provide continuous fuel to base camp generators. Tankage for motor gasoline and aviation fuel was provided by use of 55-gallon drums, 5-gallon cans and 20 500-gallon fabric blivets that were intended for use by USBATT at one of the south zone sector support sites. Where possible, fuel tank trucks were used to provide storage capacity. This was the case particularly at the north and south airfields, where 5,000-gallon fuel trailers were spotted to provide storage for aircraft refueling operations. There was absolutely no safety margin in storage capacity and fuel crises were common when storage levels were low and deliveries were late.

The source of supply prior to the transfer of the Sinai to Egypt was a PAZ Oil Company refinery in Beersheva, Israel, only a short distance from the North Base Camp. PAZ would deliver fuel and LSU could use its own fuel trailers to pick up fuel at the refinery, particularly convenient when servicing observation posts and checkpoints. During this period, few problems were encountered because of the close proximity of the fuel source. After the border change on 25 April 1982, MFO shifted to MISR Oil Company, an Egyptian firm located in Alexandria, Egypt, as the sole source of fuel. Alexandria is located near Cairo, Egypt, almost 180 miles from the North Camp and 280 miles from South

Base Camp across a rough, two-lane highway. The distances that MISR trucks had to travel, the rough roads, marginal MFO storage capacity, and a provision in the MISR contract that allowed a 10-day window on either side of the requested delivery date, caused many anxious moments in the fuel resupply business. Deliveries could not be forecast and crisis reactions would occur as fuel levels approached zero. Then, many times, deliveries would come early, and LSU operators would fill virtually every can, drum, and fuel truck available in an attempt to accept the delivery. The petroleum resupply business was indeed exciting, due primarily to a lack of tankage and storage safety margin.

The bulk fuel situation also impacted on the LSU capability to service observation post, checkpoint, and sector support site tanks. At those times when bulk fuel stockage was low, these outlying sites would come dangerously close to running out of fuel, risking a shutdown of communications and mobile patrols. Fuel was delivered to these sites by 1,600-gallon fuel trucks, over unbelievably difficult roads in harsh terrain. To augment fuel truck deliveries, and to provide emergency resupply, cargo trucks would deliver 5-gallon cans and 55-gallon drums when required. An extraordinary effort was required to provide fuel support to these sites and the constant problem of low bulk stockage levels and truck breakdowns because of terrain conditions made crisis management in fuel resupply operations the norm. Once again; however, cooperation, ingenuity, and attitude of the LSU and its customers got the job done.

WATER

The water supply problem was similar to that encountered with fuel, except that the life threatening consequences of running out of water in the desert were far more serious. The basic cause of the challenges faced by MFO in providing water was, once again, storage capacity. Initially, each base camp was supported by 250,000-gallon water tanks turned over to MFO by the Israelis, sourced in the north from Israel and in the south from a pumping station at El Tor, Egypt. MFO had programmed additional tankage (500,000 gallons in the north and 250,000 gallons in the south); but, construction would not begin until some of the more critical facilities were completed. The LSU mission in the water support area was only intended to be delivery to the observation posts, checkpoints, and sector support sites, using 1,600-gallon water trucks and 5,000-gallon water trailers.

As the population of the base camps began to expand with the arrival of contingents, water systems were pushed to maximum capacities and it became obvious that the storage capacity at the base camps was barely capable of providing for force needs. Fortunately, MFO planners had planned on emergency water rations (canned water) and a large quantity of plastic water containers and these items had already arrived at Ashdod and were stored in the warehouse. There were a series of subsequent water crises caused by water source interruptions and consumption beyond storage capacity.⁴ During these crises, LSU water-haul assets were tasked to the maximum to provide bulk water to the base camps, while simultaneously servicing the water tanks at the observation

posts, checkpoints, and sector support sites. The sources of bulk water were water distribution points in Beersheva and Eilat, Israel, and MFO reimbursed Israel by cubic meter for water that was issued to LSU trucks. Maximum use was made of 5-gallon water containers and 500-gallon water trailers to provide a safety margin during times of water shortage. Water crises could not be predicted; but, were a continuous nuisance until the additional water tanks were completed.

The water crises strained LSU assets and began to take a toll on water trucks and trailers. Normal operational procedures were for water trucks to be dispatched with fuel and cargo trucks on a scheduled basis to make deliveries to command posts, checkpoints, and sector support sites. These operations were conducted over terrible road conditions that caused an assortment of maintenance problems. The extra strain on the trucks by the heavy commitments of water crises began to cause serious problems as the water tanks separated from the chassis on several, suspension systems began to give way, etc. This problem will surface again later in the chapter.

TRANSPORTATION

Special mention must be given to the performance of the LSU Transportation Company. Earlier mention has been made of their requirements to distribute fuel, food, and water. The efforts of the "truckers" of this unit were often heroic and a large amount of credit is due this group for helping the MFO survive during some serious crisis situations. The company was relatively small as compared to the standard US Army transport company; but, its mission of providing line-haul delivery from port locations ⁷ to both base camps and short-haul

delivery to multiple observation post, checkpoint, and sector support site locations was large by any standards. In fact, the unit provided 600,000 miles of transportation support under some of the most difficult terrain conditions in the world during its 6 month tour with MFO.

The most critical initial task for the unit was to train its drivers to operate the commercial equipment that was provided by MFO. A list of equipment is at Figure 3-8. The drivers adapted quickly to most of their equipment, but, experienced some difficulties operating the 25-ton Brigadeer tractors. The basic problem was that the drivers had been operating the US Army's M915 tractors, a standard-shift, eighteen-gear truck, and the Brigadeers were automatic shift, RPM-driven tractors. This problem was particularly acute on long-hauls from Ashdod to South Base Camp, where drivers encountered a hill that exhausted air brakes about halfway to the bottom. Drivers would pull off of the road and recharge air brakes before continuing down the hill. They were not expert in using an automatic shift/brake combination instead of low-range standard gears to slow their descent. This posed a serious safety hazard that was solved when MFO installed "Jake" brakes in the tractors. Other equipment problems were a direct result of heavy use of the vehicles and difficult road conditions. The most serious problems were tank separations from the chassis of the 1,600-gallon fuel and water trucks and suspension problems on five-ton cargo trucks. At the request of MFO, a GMC representative visited the Sinai and subsequently agreed to fund modifications to solve these problems.

The Transportation Company was responsible for a broad mission and daily sent line haul trucks on runs to port and to South Base Camp. A systemic convoy system of fuel, water, and cargo trucks to service

TRANSPORTATION COMPANY EQUIPMENT LIST

Semitractor, GMC Brigadeer 25T.....	10
Tank Truck, Water 1,600 Gal.....	6
Tank Truck, Fuel 1,600 Gal.....	6
Truck, Refrigerated 20 Ft.....	2
Jeep, CJ7.....	2
Trailer, Flatbed 40 Ft.....	2
Trailer, Lowboy 40 Ft.....	2
Trailer, Water 5,000 Gal.....	4
Trailer, Fuel 5,000 Gal.....	2
Trailer, Fuel 8,000 Gal.....	2
Van, Dry Bulk 40 Ft.....	4
Trailer, Refrigerated 40 Ft.....	2
Bus, 53 Passenger.....	3
Truck, Flatbed 5T.....	7
Tank Truck, Aircraft Fuel 1,600 Gal.....	1

FIGURE 3-8

checkpoints, observation posts, and sector support sites was established to provide scheduled support. Flatbeds and lowboys were used heavily to transport supplies and equipment. Refrigerated trailers and forty-foot box trailers were used daily for ration runs and to support resupply operations. The unit also operated four 53-passenger buses to provide transport for personnel to Ashdod and Tel Aviv on a daily basis, along with other requirements. In addition, the Transportation Company established and operated arrival and departure operations at base camp airfields to handle cargo and passengers for the French fixed wing aircraft. To accomplish this mission, the soldiers improvised a cargo loading system by bolting roller-conveyors to a flatbed cargo truck to be compatible with the loading system on the C-160 Transall. This operation was also enhanced by the fact that one of the LSU soldiers was fluent in French and established excellent rapport with the French loadmasters. This airfield control function was critical to efficient air movement and aerial resupply operations.

The Transportation Company was also tasked to establish and operate a Movements Control Center. The MCC was designed to task the line-haul assets of the LSU, to task the assets of the Uruguayan Car Company,⁸ to control the movement of passengers on the buses, to control the movement of passengers and cargo on French fixed-wing aircraft, and to control and coordinate the movement of any personnel out of Zone C (after the 25 April 1982, border change).

The MCC mission was critical particularly after the border change on 25 April 1982. When the Sinai was transferred to Egypt, international border crossing points were established by both countries on the road connecting with Tel Aviv and Israeli port cities. Soon after the border

change, both nations began to exercise their sovereignty by imposing more stringent border crossing procedures. At one point, it seemed that administrative requirements for MFO border passage changed daily. At the same time, the Force Commander insisted that MFO have free passage rights through the international border, contending that free access was implied by the protocol, on the one hand, and that MFO's lifeline to the ports must remain unimpeded for the survival of the force, on the other hand. The LSU truck drivers were placed in the middle of this sensitive political situation because daily border crossings were essential to the mission. Elaborate procedures were developed to authorize crossing. Israel and Egypt required that access be limited to 200 MFO personnel and demanded a list of names, which MFO provided. Most of the soldiers on the list were LSU truck drivers. The parties also required that notification of who was to cross the border be made to border officials the day prior to the travel. MFO complied by having the Movement Control Center serve as the central coordinating point for cross-border travel, collecting and delivering rosters to border officials and closely controlling travel across the international border. LSU drivers were instructed not to comply with demands at the border, other than presentation of their MFO ID card and travel authorization form. Many drivers were required to spend the night at the border, on either side or between Israel and Egypt, awaiting a liaison officer to come to the border and resolve conflicts. Drivers were required to carry rations, water, and a bedroll on any mission across the border for this reason. Conflicts arose regarding paperwork, procedures, demands for cargo manifests, and requests to open cargo shipments for inspection. Keeping the border situation stable was a

continuous, day-to-day proposition, requiring courage and patience. To the LSU, this was only another obstacle to be overcome in supporting the force.

The other concern in the transportation area was safety. The roads were mostly two lane and in a varying state of disrepair, causing very hazardous driving conditions, particularly for vehicles that traveled with excessive speed. The roads were also traveled heavily by locals who would travel too fast and really not care too much which side of the road they occupied. This was particularly dangerous on blind curves. The climate presented hazards for drivers traveling throughout Zone C on observation post delivery missions. Flashfloods would come without notice in the desert wadis, washing out roads and everything on them. Lone vehicles broken down in the desert presented risk of dehydration or heat stroke to drivers who were not prepared. Finally, minefields, both marked and unmarked, were all over the desert, some just off of the roadway. It was common for sandstorms to shift mines onto the roads, and drivers were warned to be particularly watchful after floods or sandstorms and were strongly cautioned not to leave the roadway. Safety was a subject that required daily emphasis and every convoy briefing contained mention of these hazards. Fortunately, there were no fatalities (although there were several accidents) during the first LSU's tour of duty in the Sinai.

MEDICAL OPERATIONS

The medical support concept revolved around the establishment of clinics in both base camps that would offer a wide range of medical services, including X-ray, dentistry, outpatient medical care,

orthopedic, behavioral science, pharmacy and laboratory operations, inpatient medical care, and life-saving emergency care. The Medical Company was also responsible for medical supply, preventive medicine, ground evacuation services, veterinary services and air evacuation.

From the outset, medical support, although austere, was the most stable component of the LSU mission. The Medical Company suffered from the same lack of facilities as did other functional LSU elements; but, was able to provide support from temporary facilities, using field medical and dental support sets brought from CONUS for use until the clinics were established. Medical support grew nicely as facilities came on line and no interruption of support was required. There was a continuous, progressive improvement in the unit's capability and efficiency as the base camps matured.

There was an immediate need for preventive medicine and veterinary support almost from the first day of arrival. Veterinary personnel were heavily committed to performance of inspections of food storage facilities, local Israeli and Egyptian sources of food supply, subsistence delivery operations, and food service operations at the four MFO dining facilities. Just as busy were the preventive medicine experts, conducting a full review of water supply facilities, waste water handling and solid waste disposal facilities, and food storage and preparation procedures. Their recommendations and assistance were a major contributor to the low rate of disease among MFO soldiers and a high availability of manpower. In addition to scheduled inspections of all base camp and observation post/checkpoint facilities, the preventive medicine section developed an extensive "hands on" training program for hygiene and first aid and, in combination with Explosive Ordnance

Disposal safety briefings, presented instruction to all MFO personnel. The Force Commander subsequently directed that the training be given to all contingents as a mandatory requirement. One measureable result of this effort and command emphasis was a surprisingly low heat injury rate.

Medical supply activities were managed by the Medical Supply Officer of the Medical Company, not LSU Logistics Operations Section. The medical supply system, however, similar to all other classes of supply in that the bulk of medical supplies were requisitioned from the DOD wholesale system, supplemented by commercial procurement, and, in cases of critical shortages, were locally purchased with funds from a revolving account by the medical supply officer. Here again, the DOD system was by far the most economical source of supply; but, commercial procurement during the initial stages of the operation frequently was employed to solve crises of short supply--at an exorbitant price. In addition, direct coordination with the US Army Medical Center, Europe, provided a source for expediting delivery of high priority medical supplies and proved to be an extraordinarily reliable resource.

Medical evacuation was provided by a mix of tactical, M886, ambulances in South Base Camp, commercial ambulances purchased by MFO, and air evacuation, using helicopters provided by ANZAC and USBATT. By far the most difficult to organize and establish was the air evacuation system. Political sensitivities involving care of MFO patients in Israel or Egypt and overflight rights/flight corridors were very difficult to resolve. Add that to operational problems because of differing US and ANZAC operating procedures and the solution became even more complex. Procedures, however, were frequently tested,

and worked exceptionally well in numerous real-world, emergency situations.

Although the Medical Company was tasked to provide medical support, several other contingents deployed with doctors. These high-quality physicians worked alongside US military doctors and actually enhanced the force medical capability. Although medical operations were conducted in temporary facilities and, at times in the open, using tactical medical field equipment, the disease rate among MFO soldiers was relatively low as indicated by Figure 3-9. Throughout the 6-month deployment period, quality, professional health services were a highlight among LSU operations.

SOUTH BASE CAMP OPERATIONS

There were several unique considerations in providing support to the South Base Camp. First, there was the distance between Sharm el Sheikh and the ports of embarkation and storage facilities at the North Base Camp. There was also the size of the USBATT operational area, which encompassed almost half of the total area in Zone C. The presence of a dedicated helicopter fleet (10 Hueys) and tactical, rather than commercial, equipment posed special support challenges. Communications with the South, particularly during the early days, were intermittent and not reliable. Although communications improved drastically later in the mission, early problems were a constraint to logistics operations. There were special water problems posed by limited tankage and an unreliable source of supply. There existed also a higher expectation of responsiveness of the logistics system than other contingents who were not accustomed to the high-tech capabilities of the US Army logistics

ILLNESS AND DISABILITY, MFO, 1982⁹

Monthly sick call, cases per 1,000

Heat Injury	1.6
Respiratory Infections	41
Gastroenteritis	25
Venereal Disease	1.6
Psychiatric Illness	0.6
Alcohol and Drug Intoxication	0.6
Dermatologic Problems	24
Other Medical Illnesses	149
Trauma	92

Daily preventable disease disability: 2.0 per 1,000

FIGURE 3-9

support structure. To compensate for these unique conditions, a 60-man LSU detachment, comprising a slice of all support functions provided by the LSU, was positioned to provide dedicated support to USBATT and the Italian Coastal Patrol Unit. LSU-South operated a small self-service supply and repair parts warehouse, provided retail and bulk refueling support, provided transportation support with tractors, water and fuel trailers (5,000-gallon), cargo trucks and water/fuel trucks (1,600-gallon), operated a small Movement Control Center, conducted airfield arrival and departure passenger and cargo operations, provided postal and finance support, operated the South Base Medical Clinic, provided limited communications and small arms repair support, and delivered fuel, water and cargo to USBATT observation posts, checkpoints, and sector support sites. In effect, LSU-South on a small scale possessed the capabilities of the larger LSU main element at North Base Camp. Support requirements tasked LSU-South to the maximum of its capabilities and the hard work of this relatively small group was instrumental in lessening the impact of water shortages, erratic fuel deliveries, food shortages due to delays in deliveries from the North Base Camp, and numerous other crisis situations. LSU-South earned its pay every day without a great amount of guidance and assistance from LSU-North.

THE LSU SOLDIERS

The tour of duty of the first iteration of the LSU ended in August 1982, when it was replaced by a twin unit assembled by 1st COSCOM and deployed to pick up the mission where the first LSU left it. This transition was accomplished over a three-week period, a short time for a new unit to pick up the unique concept of logistics built especially for

MFO. Like all other activities during its tour, the LSU performed the transition professionally. It was obvious, however, that rotation of units to provide logistics would create too much turbulence in the MFO support system and that continuity in a rotational system was a goal that could not be attained. A recommendation was forwarded through 1st COSCOM to Department of the Army in September 1982, that the LSU be converted to a permanently stationed unit staffed by an individual replacement cycle based on 12-month tours of duty. This vision was to be prophetic.

The soldiers of the first LSU returned to Fort Bragg, North Carolina, and, just as they had joined the unit, soon returned to the jobs they had left. It is not possible to express in words the contribution of these soldiers to the success of MFO. Never in recent memory had soldiers faced such austere conditions, overcome such improbable odds, conquered so many problems, or served so proudly. It was the uncommon dedication, the irrepressible spirit, the won't-quit-til-the-job-is-done attitude, the desire of these soldiers that made the system work and kept MFO alive in the early days. They had come together as strangers in a different world, operating with an alien set of rules and procedures. They were seared by the sands, winds, and heat of the desert and tempered by the pressure to produce results in spite of conditions. They were brothers of a spirit born of hardship and hard work. They did not complain. They were creative. They were steel! Let their accomplishments stand as a tribute to their dedication (Figure 3-10). And let their "Can Do" spirit be the standard by which other hard men in future hard times are measured. They were magnificent.

ENDNOTES

1. Explosive Ordnance Demolition personnel and doctors, nurses, and low-density medical specialists were provided outside of 1st COSCOM.

2. Certain OP/CP locations were mandated by the parties to the treaty, others were selected because the sites offered best observation of surrounding terrain or controlled a choke point. Although logistics supportability was a determining factor in some cases, there were some sites selected in spite of support difficulties, particularly access roads.

3. At this point it appeared that construction was about 30 to 60 days behind schedule. It would actually take 120 to 150 days longer in some cases, such as fuel and water tanks and the North Base Camp warehouse (90+ days). The construction delays would be the biggest problem faced by the LSU.

4. The operations section and S-1 section occupied the livingroom and dining room. The commander and executive officer used their bedrooms as an office. The headquarters was operational on a 24-hour basis. Privacy and relaxation were not possible.

5. This problem was particularly serious when the border changed and international checkpoints were set up on 25 April 1982. Because of difficulties in transiting the border, a trip to Ashdod took all day, and at times drivers were trapped and spent the night on the road near the border.

6. Part of this problem in the North was that Beduins would "tap" the water lines to provide water for their goat herds and irrigation. This resulted at times in drastic reductions of water to North Base from Israel.

7. MFO used Ashdod, Israel, as POD most of the time; but on some occasions took shipments at Haifa--considerably farther from North Base Camp.

8. Uruguayan drivers operated sedans, some "Suburban"-type vehicles, and school buses.

9. "Medical Support of the Sinai - Multinational Force and Observers, 1982," LTC Michael A. Dunn and MAJ Richard W. Smerz, not dated.

LOGISTICAL SUPPORT UNIT STATISTICAL SUMMARY

o PROPERTY RECEIVED, ACCOUNTED FOR, ISSUED	\$30 MILLION
o CARGO MOVED	6,200 STON
o PASSENGERS MOVED	10,500
o VEHICLES DEPROCESSED	500
o WATER DISTRIBUTED	400,000 GAL
o POL DISTRIBUTED	1,500,000 GAL
o RATIONS ISSUED	\$1,500,000.00
o LINE ITEMS WAREHOUSED	10,000
o APO OPERATIONS	250,000 LBS OF MAIL \$ 500,000 IN MONEY ORDERS
o FINANCE OPERATIONS	\$2,000,000

FIGURE 3-10

CHAPTER IV

CURRENT MFO LOGISTICS POLICIES

GENERAL

The current MFO Logistics Policy was reviewed to ascertain the adequacy of the initial planning and to determine if the present policies were an evolution or a revolution of the original concept. This is a unique evolution in that the developer and the implementer had the opportunity to relook the entire operation almost precisely four years later. It was a difficult situation in that the logistics policies, procedures and operations could have been poorly designed, implemented and executed.

The present logistics operation is a direct evolution of the planned operations and the original planning, design and initial operations laid the foundation for present day operations. The present operations are a maturing process of the initial procedures.

The total force was now approximately 3,600 personnel, the increase due to increased support and administrative personnel. The use of commercial equipment was an unqualified success. The equipment had performed well and the durability exceeded the original expectations. The use of a support contractor had been successful and due to another contract period another contractor had been selected to provide support services. There was a change in the structure which permitted a more streamlined organization that was more responsive and preserved the unity of command. The position of Chief Management Officer (CMO) was

deleted and a contracting officer position established to monitor the contractor's performance. This modification provided the Force Commander and his staff more flexibility and gave additional expertise for administering the contract for support services.

Each of the major subject areas discussed in Chapter II will be discussed in the detail necessary; however, the authors are pleased to report few major changes have been implemented and those changes that were implemented were due to the maturity of operations and not other factors. The discussion of operational procedures will be discussed in Chapter V and the discussion here will be limited to policy matters.

EQUIPMENT

The commercial equipment has performed beyond the original expectations. The vehicle fleet has performed well and is now in the process of being replaced. The commonality of the fleet eased the repair parts problem and serious consideration is being given to maintaining this standard fleet concept. Some of the tractor-trailers are being replaced with a more durable heavy duty tractor in an attempt to gain improved performance. The commercial generators were a pleasant surprise. They are still in place and providing service. The communications equipment continues to perform its mission and a study/proposal is underway to update this system.

This is not to say that there were no problems. There were problems but they were not of the nature as to threaten mission performance. The equipment was used by different rotations each six months and this increases the wear and tear on all equipment. Credit for success of the equipment must be shared by all the force, the users, the support

element and, the others in the management chain that have to make the difficult decisions to keep things moving.

FACILITIES

The most remarkable change is in the improvements in the facilities. The facilities are complete, functional, well maintained and adequate for mission performance.

SUPPLY

The present supply system is functioning as originally envisioned. The source of supply is DOD or local procurement either from Egypt, Israel, US or other sources. The requisition process is the same and now a more efficient method of passing requisitions is under design as the present system is too slow and cumbersome. The Force Material Management Center (FMMC) is a new concept designed to more accurately account for supplies and is presently being implemented. The Force MMC is discussed in Chapter V.

MAINTENANCE

The original maintenance policies are still intact.

WATER

The water problem continues to exist and always will in this region of the world. The storage capacities are adequate at both the North and South bases, the problem of supply to these facilities is under review at the present time. The planning factors for water consumption were accurate and provided the safety level required to assure sustainment.

This continues to be the major problem for the logistical community and the only area that requires constant high level management time. The resolution of this problem would be of great importance yet one wonders if there is a firm solution to this situation.

FUEL

This area continues to provide satisfactory performance. The storage capacities and consumption factors have proven to be valid.

FOOD

Food is a most positive morale factor. The quality and quantity of food provided to the soldier is excellent. The DOD food is utilized, supplemented by local fresh fruits and vegetables and other contingent unique requirements (wine, etc.) as needed. During our visit, the food service operation was complimented numerous times. This is an unqualified success because there is no alternative outside the front gate. The South Base (US Battalion) food service is also excellent, however, a proposed change is contemplated to convert the operation to a support contractor operation.

The food at the CP/OP is now prepared on site by the soldiers. This was envisioned in the initial planning and is proceeding as planned.

CHECKPOINT/OBSERVATION POINT FACILITIES

The CP/OP equipment and facilities were in excellent condition. The module, water tanks, kitchens and generators had performed as predicted. There is now an upgrade/repair program underway and the stoves have just

been replaced in all sites. This is a scheduled program to replace items due to fair wear and tear.

HEALTH, MORALE, WELFARE

The policies continue to support troop morale by numerous on post activities and a boarding list of areas for trips and tours. The policy has remained unchanged, the execution has improved due to a mature force and more travel opportunities becoming available.

SUPPORT CONTRACTOR

The original support contractor has been replaced by the expiration of the original contract and the rebidding process. The support contractor support has been an evolutionary process and as time goes on more precise requirements are necessary. This is being done and the support provided keeps the force operational. The transition from one contractor to another has been completed and support was not interrupted.

CHAPTER V

CURRENT MFO LOGISTICS OPERATIONS

Comparative observations between initial plans and logistics operations and the MFO logistics system, as it exists today, are based on a trip to MFO in March 1986, almost exactly 4 years after initial deployment of the Logistics Support Unit to the Sinai. During this visit, a detailed review was made of the logistics concept, along with tours of all logistics operations. The itinerary at Figure 5-1 outlines the comprehensive nature of the visit and points of interest that were examined. The visit to the force headquarters and force units was followed by an abbreviated visit to MFO Headquarters in Rome for discussions of current logistics operations at the executive level. The conclusion that resulted from our observations is that current logistics operations are remarkably close to the concept of logistics operations that was envisioned by the group that developed the logistics concept and established initial operations during the early stages of the MFO's existence. There are operations and procedures that have not changed at all over the years and there are improvements that have been made over the original concept which make the system better. This chapter is a discussion of those similarities and differences.

ORGANIZATION OF THE LSU

The Logistics Support Unit organization has evolved from the "straw man" table of allowance developed by 1st COSCOM planners in 1981 into a Table of Distribution and Allowance (TDA) that formally recognizes it in

PROGRAMME FOR VISIT BY LTC's CREEL AND WRIGHT

DAY/DATE (a)	TIMES (b)	ACTIVITY (c)	REMARKS (d)
Mon 10		By road from Cairo	With LTC Savage
Tue 11	0800-0825	TOC Briefing	
	0830-0850	Discussion with CLO	
	0900-1200	FMMC Briefing	Major Hohnstine
	1200-1330	Lunch	
	1315-1345	COS Interview	
	1345-1450	FMCC Briefing	Major Zerance
	1500-1630	HNSI Briefing	Mr. Staton
Wed 12	0830-0930	By Transall to Ras Nasrani	Latest reporting time 0800. FMMC transport within NC. LSU transport to SC.
	1000-1130	LSU (SC) Briefing	Captain Wharton
	1130-1300	Lunch	
	1300-1430	USBATT Briefing- MFO Logistics from the user's point of view.	Captain Shambach
	1430-1500	Drive to Ras Nasrani	LSU (SC) transport Latest reporting time, 1500.
	1530-1630	Fly to NC	FMMC transport with- in NC.
Thur 13	0800-1200	LSU Briefing	
	1200-1300	Lunch	
	1330-1530	Discussion with CLO/ note writing	
	1530	Drive to Tel Aviv	
Fri 14	0500	Flight to Rome Italy	
	0930-1700	Visit with Logistics Staff-Rome MFO Head- quarters	Mr. Bob Dyer
Sat 15		Depart Rome Airport for NYC	

FIGURE 5-1

the US Army force structure. A comparison of the initial organizational framework and the TDA that exists now reveals surprisingly few differences. The unit is still authorized 356 personnel, is authorized essentially the same equipment, and retains the same organizational framework as was developed in 1981. There have been a number of individual line changes as they are related to particular military occupational specialities or rank structure for particular positions in the organization; but, these changes primarily reflect evolution of the requirements of the mission as MFO matured. The only major difference is addition of a sizeable organizational maintenance capability that was not permitted during the initial deployment because the civilian support contractor was tasked to provide all maintenance above operator level. This change reflects a change in the force maintenance concept and a modification in the mission of the civilian support contractor. The major conclusion of this comparison is that the planning of the organizational structure of the LSU has generally stood the test of time and that what minor differences that exist in today's organization are a function of evolution of the mission as MFO matured.

LSU tour length deserves special mention because of the impact of tour length on stability of the logistics system and continuity of operations. As you recall from discussions in Chapter III, the LSU was initially a rotational unit, requiring exchange of the entire organization every 6 months. A major recommendation made after the first rotation was that a system of individual replacements, serving 12-month tours of duty, be adopted. The basis for this recommendation was the extreme turbulence caused by rotation of the logistics operators, the complexity of the MFO logistics system and need for continuity and

the difficulty in maintaining inventory accountability for MFO stocks when units were rotated and a new group assumed responsibility. A major factor also was the difficulty of the continuing requirement to form the LSU from throughout the Army, repeat training, equip the unit and deploy it every 6 months. The drain on Army manpower and resources that was required to support this system was unacceptable. The recommendation to extend tour length and convert to individual replacements was finally approved, implemented, and has had a very visible, positive influence on the stability of the logistics concept and the quality of support provided. In addition, the commander of the LSU is now selected within the Army Central Command Selection System, ensuring that the best qualified commanders serve in the LSU and reenforcing the US Army's resolve to provide quality personnel to the MFO. These steps have made significant improvements over the rotational system.

FACILITIES

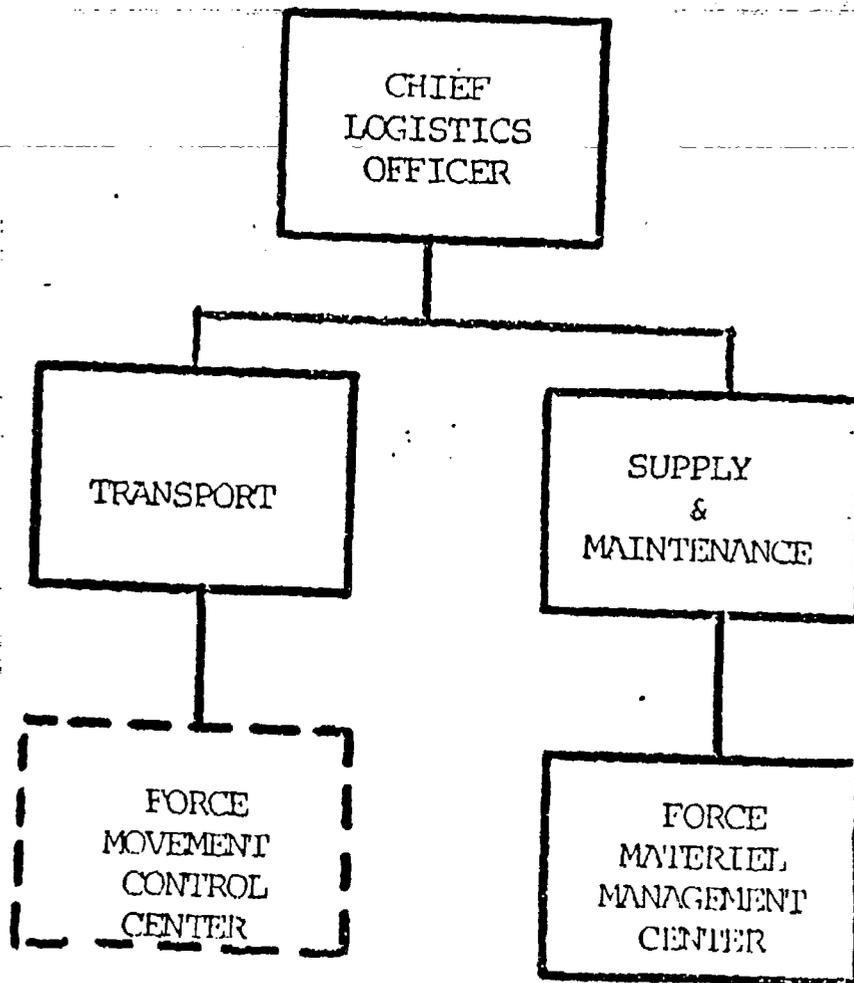
The greatest improvement in current operations over those of the first LSU is in the area of facilities. Since the lack of facilities caused by significant delays in the construction schedule was the single most serious constraint on initial logistics operations, the improvements in this area are highly visible. Warehouses, bulk fuel storage tanks, water storage tanks, and the petroleum testing laboratory are all on line and functioning as part of routine logistics activities. The availability of these facilities has eliminated the need for the improvisation and field expedients that characterized initial operations. Facilities availability has also eliminated many of the support problems experienced in 1981 with fuel deliveries, water

shortages, and storage limitations. With one exception, the LSU occupies the same facilities that were programed for use by the first MFO logistics planners. The exception is that a large cold-storage warehouse was added to the logistics complex to expand storage capacity for perishable subsistence items. The LSU facilities are very adequate for mission activities and LSU soldiers now enjoy the use of modern recreational facilities not available in the early days of the MFO.¹ Here again, the planning was on target and the facilities programed are more than adequate to support logistics support activities.

MATERIEL MANAGEMENT

The most significant improvements over initial operations have been made in the area of materiel management. Although initial LSU planning envisioned the evolution of the materiel management function into an automated system, the intent was to keep materiel management responsibility in the LSU, with the Logistics Operations Section executing plans and policies and providing guidance and direction to accountable officers. The system has not evolved in this way and MFO has carried coalition logistics a step further by creation of a Multinational Force Materiel Management Center.

Basically, the FMCC represents a consolidation of materiel management functions that once were shared by the LSU and the force staff under the direction of a single level of management. Organizationally, the FMCC is under the staff supervision of the Chief Logistics Officer (Figure 5-2) and provides the force with materiel acquisition, supply management, maintenance management, and property accountability support. This mission is much broader than programed for



the LSU Logistics Operations Section and provides for more effective centralized supply and maintenance management.

The FMMC itself is directed by a US Army Lieutenant Colonel primarily because of background and experience with the backbone of the MFO logistics system, the DOD wholesale supply system. The organization of his operation is shown at Figure 5-3. The organization is staffed by a combination of personnel from the force staff and from the LSU. This staffing arrangement has some potential to create conflicts between logistics operators of the LSU and the FMMC; however, cooperation and a close working relationship between the two elements appears to have precluded this occurring to this point. Each of the functional sections has a clearly defined functional role:²

- o Procurement Section--Staffed by a civilian procurement manager, an assistant procurement manager, and two procurement clerks, this section reviews all requests for procurement or local purchase and serves as the interface between the force and MFO purchasing agents in Cairo and Tel Aviv. The section also serves the critical function of monitoring status of purchase requests, verifying receipt and issue, and reconciling open purchase vouchers.

- o Service Support Section--Staffed by a US Army Technical Supply Officer (Warrant Officer 762A), stock control clerks, customer service clerks, and computer analysts, this section is responsible for providing customer service, editing and document control, cataloging, inventory control, reconciliations, records maintenance, and computer operations. The section receives all force supply replenishment requests, processes requests by input to the computer, interacts with storage activities, supervises inventories, and maintains accountable records. This section also is responsible for maintenance and operation of a Honeywell computer and standard US Army DS4 software package.

- o Food Service Section--Staffed by a Canadian food service officer, New Zealand subsistence sergeant, and stock control clerks, this section monitors subsistence inventories and requests replenishment by requisitioning through the DOD system or requesting commercial purchase, is the interface between the force and all sources of subsistence supply, monitors LSU receipt, storage, and issue procedures, and establishes policy for and monitors MFO mess operations. Subsistence operations are essentially the same as those conducted during the initial deployment phase.

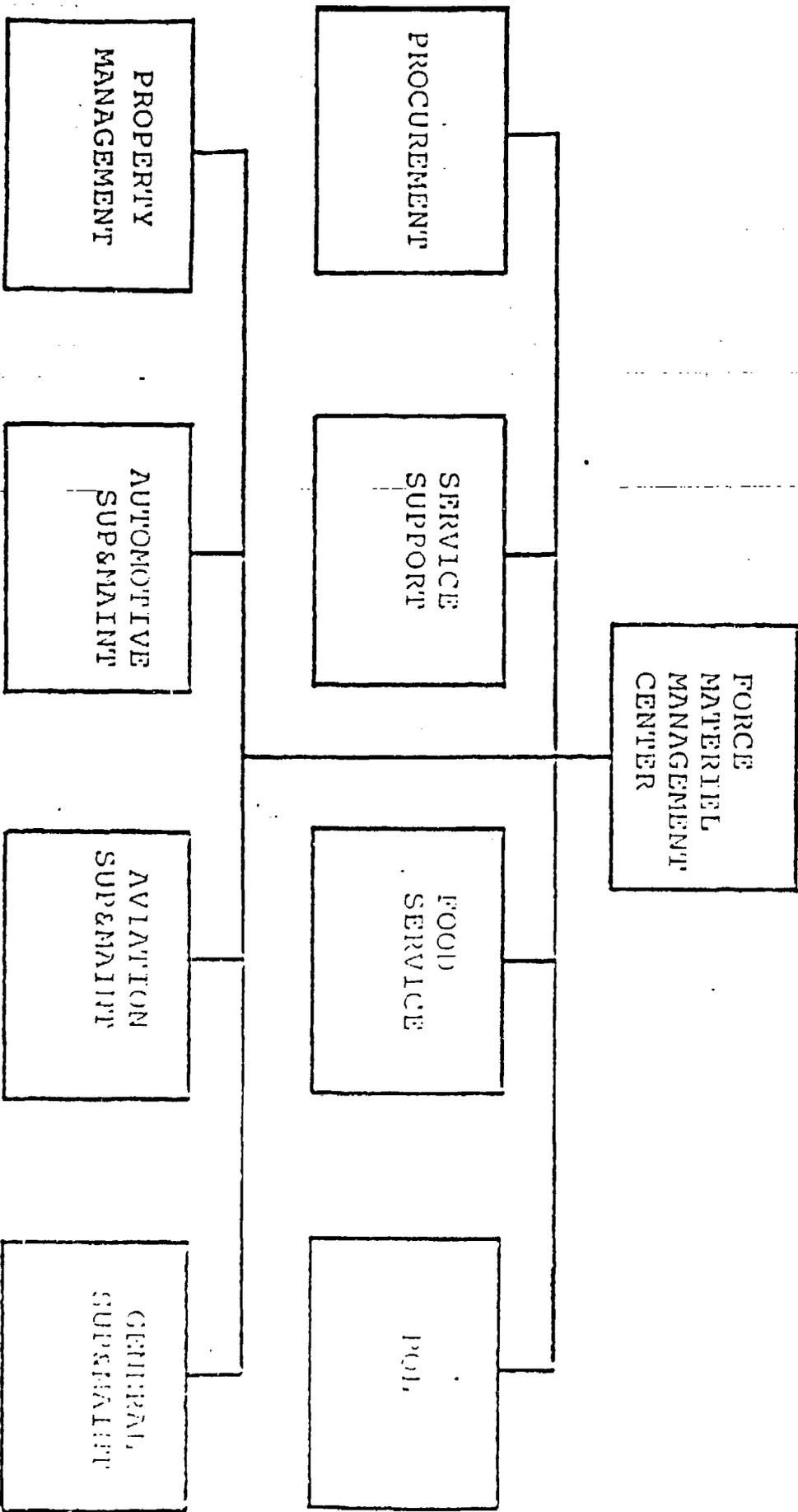


FIGURE 5-3
91

o Petroleum, Oils, and Lubricants Section--Staffed by a US Army petroleum officer and sergeant, this section manages the acquisition of bulk petroleum and packaged POL products, manages/monitors all petroleum contracts (primarily MISR), monitors LSU receipt, storage, and issue procedures, oversees the operation of the fuel testing laboratory,³ and evaluates fuel operations.

o Property Management Section--Staffed by a US Army Supply Technician (Warrant Officer - 761A), two supply sergeants, and six supply clerks, this section was responsible for development and maintenance of Equipment Entitlement Tables⁴ for all elements of the force. As the force Property Book Officer, the chief of this section provides EET's to contingents and to the computer element of the service support section for run on the US Army Standard Property Book System (SPBS) software. It is the PBO's responsibility to ensure that all equipment authorized on EET's is on hand or on order, to record all force nonexpendable property on the property book, and to extend accountability to the user through hand receipts.⁵ The value of the property is \$119 million, a substantial increase since the inception of the force. This system is a substantial improvement over the manual operations conducted during the initial deployment phase; but with some modifications is representative of the system envisioned to exist by initial MFO planners.

o Automotive Supply and Maintenance Section--Staffed by a New Zealand automotive supply officer and a Uruguayan maintenance officer and assorted maintenance and stock control personnel, this section manages repair parts, maintenance operations, and establishes maintenance standards for MFO. By far, the largest section in terms of the number of line items managed and requisitions processed, personnel in this section manage civilian and US military repair parts, control the MFO maintenance float,⁶ and monitor COPADS requests, as well as monitor LSU receipt, storage, and issue procedures. This operation is a substantial improvement over the system envisioned by initial LSU planners.

o Aviation Supply and Maintenance Section--Staffed by Australian and New Zealand aviation supply and aviation maintenance officers⁷ and assorted repair parts and stock control clerks, this section manages repair parts for rotary wing aircraft and supervises the Israeli Aircraft Industries (IAI)⁸ contract. It also establishes maintenance standards and monitors maintenance operations by USBATT and ANZAC aviation maintenance sections. Currently, the section is developing an aviation repair parts direct exchange concept. This operation also is a substantial improvement over the system envisioned by planners in that it centralizes management of aviation supply and maintenance activities.

o General Supply and Maintenance Section--Staffed by a US Army general supply officer, an Italian naval supply and maintenance officer, a stock control sergeant, ammunition sergeant, and stock control clerks, this section manages expendable supplies, self-service supply center stocks, barrier and construction materials, facility engineer spares,

ammunition, major end items, naval, medical, and communications supplies, and oversees the repair or disposal of equipment. The section also has the significant responsibility of managing the Force Logistics Financial Management Plan, budget execution process. Procedures for handling scrap or unserviceables are to retrograde through US channels,⁹ sell through auction or scrap contract, or disposal as waste.

As a general statement, it appears that the formation of the FMCC offers some distinct advantages, particularly because it centralizes management of supply and maintenance, and separates supply accountability from responsibility for receipt, storage, and issue activities. Automation of stock accounting records and the force property books is also a significant improvement over the manual procedures that were necessary during the establishment of the logistics concept. Although automation and more effective materiel management capabilities were envisioned by logistics planners as a natural evolution of the logistics concept, the formation of the FMCC is a substantially improved concept which offers features not envisioned during initial planning. In addition, the FMCC more closely represents the multinational character of the force.

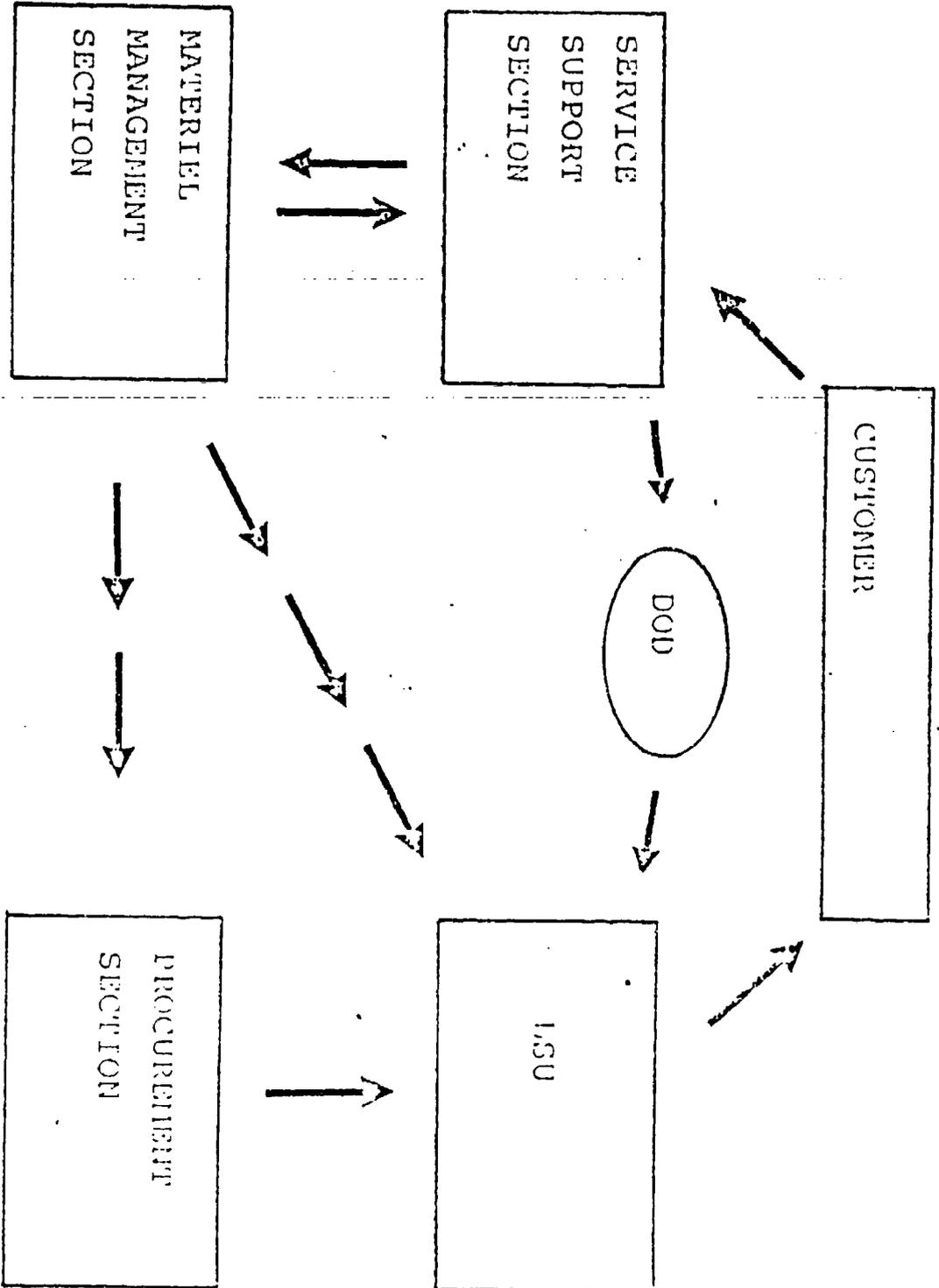
THE REQUISITIONING PROCESS

Automation of the logistics management system has made major modifications in the requisitioning system possible and transmission of requisition data via magnetic computer tapes has purified the interface between MFO and the 201st MMC at Camp Darby, Italy. Posting of receipts and issues, materiel release orders, automatic requisitioning activity, reconciliations, and inventory control are all functions that are

accomplished by the MFO's DS4 capability, a substantially faster, more efficient system than the manual capability of previous supply managers. All of these enhancements make improved requisitioning procedures possible.

Figure 5-4 depicts the request flow system; but, requires explanation to clarify procedures that apply to the replenishment process. First, all resupply requests, whether expendable, nonexpendable, DOD, or local purchase are submitted by the requesting contingent to the service support section. The service support section will edit requests, provide assistance or training in MFO supply procedures, or assist in item identification. The service support section will also verify authorization for nonexpendable item requests.¹⁰ Requests are forwarded from the service support section to the appropriate materiel management section for validation of priority and review of stock status. If stocks are on hand, storage activities in the LSU are directed to release supplies by Materiel Release Order. When items requested are not on hand, a requisition to access the DOD wholesale system or a local purchase will be prepared. Local purchase requests are passed to the procurement section, where they are reviewed to determine the best source of supply based on cost, availability, and priority. Purchase requests are passed to either Cairo, Tel Aviv, or Rome MFO purchasing sections based on the results of the source of supply determination. When received, local purchase items are processed through the LSU and issued to the customer. Local purchase actions are generally completed in 30 to 60 days. Items requested from the DOD system are processed as requisitions on the DS4 system. Requisition output will be generated by DS4 in the form of a

REQUEST FLOW



magnetic tape which is sent to the 201st MMC, where the tape is run on the SAILS system and requisition data is captured and transceived via DAAS to CONUS NICP's. Items are then shipped by MFO freight forwarder to the LSU for issue to customer units. This process takes about 120 days.

The current MFO requisitioning system has evolved into a much improved process. Eliminated are many of the characteristics of the initial system described in Chapter III. There is no longer a requirement for approval of funding of items requested by the Chief Management Section. FMFC has responsibility for preparation and execution of the Force Logistics Financial Management Plan and, therefore, makes its own funding decisions. Requisitions are now transmitted to 201st MMC via magnetic tape, not typed out line by line for telex transmission. DS4 makes more real-time, accurate inventory data available and also permits reconciliations with the 201st MMC by magnetic tape. The system in being today for replenishment of supplies makes fast, efficient requisitioning activity and expeditious support a reasonable goal.

SUPPLY SUPPORT

With the exception of the facilities improvements mentioned earlier in this chapter, supply support operations in the areas of fuel, observation post/checkpoint/sector support site replenishment, LSU-South operations, warehousing activities, and maintenance support are essentially the same as those established and practiced by the first LSU. There are even continuing water supply problems at South Base Camp due to the existence of the same source of supply breakdowns that were

experienced in 1982. In fact, during our visit to MFO there was an ongoing water crisis at South Base Camp that LSU trucks were trying to alleviate by hauling water in from a source of supply in Eilat. This was a familiar scene in 1982 and serves as an example that not all logistics problems have been solved by today's MFO. Generally, the support framework and basic support procedures established in 1982 have stood the test of time and exist in MFO today.

TRANSPORTATION SUPPORT

The major change in transportation operations, and along with the formation of the FMCC one of the most significant differences over initial operations, is the consolidation of the Movement Control Center under the control of the Chief Logistics Officer, combining LSU members with staffers from the force logistics staff. Like the FMCC, the FMCC (Force Movement Control Center) has more of a multinational flavor and has an expanded mission over that established and operated by the first LSU. The FMCC continues to provide transportation support to MFO by tasking LSU and Uruguayan transportation assets on a daily mission basis. It is also the central point of contact for scheduling air and cargo movements for MFO's organic fixed and rotary wing air movement assets and monitors the arrival/departure airfield control functions performed by the LSU to control personnel and cargo movements from North and South Base Camp airfields. Although still responsible for coordination of cross-border movements, it is important to emphasize that the FMCC role is reduced in this area because international border crossing procedures are stable and MFO crossings at the international border are routine. This is in sharp contrast to the daily border

crises faced by early LSU truck drivers and is an indicator that MFO has earned tremendous credibility with Israel and Egypt and MFO access rights are respected. The FMCC role has been expanded to include the very difficult and visible responsibility of coordinating transportation for rotating contingents, is responsible for coordinating movement of household goods for US personnel, monitors the operational status of MFO's vehicle fleet and is responsible to coordinate reappportionment of assets when required, and is the central point of contact for excursions in Israel and Egypt. Logistics planners did not envision this centralization of movements control functions in the planning process. The functions performed are essentially the same; but, the organization seems to be more effective because all transportation operations are consolidated under central control.

The mission of the LSU Transportation Company, with the exception of controlling the MCC, is essentially the same as that of the first LSU. Amazingly, some of the same trucks and trailers that were in use in 1982 are still road worthy and performing their mission. It is obvious, however, that heavy use and difficult terrain conditions have taken their toll and these items of equipment require maintenance more frequently than desired. It is critical that the MFO continue to schedule replacement of these assets so that equipment failures do not degrade mission performance. In this regard, there is a vehicle replacement plan that ensures that the force has the transportation assets that are so essential to the survival of the MFO lifeline. Examples of the replacement concept are new Mack tractor replacements for the GMC 25-ton tractors. A continuation of this replacement concept keeps MFO logistics moving. It is quite remarkable that the equipment

purchased by MFO planners to last three years is still being used effectively over a year beyond its estimated life. It appears that the MFO experience lends credence to the concept of the purchase of commercial, off-the-shelf equipment for military use.

CONCLUSION

There is a remarkable similarity between current logistics operations in support of the MFO and the system that was envisioned when the first LSU deployed in 1982.¹¹ There are substantial improvements in the quality of operations as a result of the maturity of the base camps, completion of facilities, conversion of the LSU tour length to one year, and easing of restrictions at the international borders. In spite of these startling improvements over initial LSU operations, the basic concept of operations and supply system procedures developed prior to deployment of MFO remain intact. Although initial operations were manual, rather than automated, it was always assumed by the logistics concept developers that maturity of the force would eventually require automation of the logistics system. However, creation of the Force Materiel Management Center and Force Movements Control Center under the control of the Chief Logistics Officer is an enhancement not foreseen by logistics system architects. This organizational modification gives the management of logistics activities a more "multinational" flavor and may offer significant advantages over the materiel management and movements control systems planned for and established by initial planners. In spite of this exception, it is clear that the vision of the planners and operators in 1982 was on target and the product is a model for coalition logistics.

CHAPTER V

ENDNOTES

1. Facilities include modern, well-equipped gymnasiums, fully equipped recreation rooms, swimming pools, tennis courts, racquetball/handball courts, closed-circuit TV system, and modern enlisted and officers clubs.
2. Information from MFO Force MMC briefing notes.
3. The fuel laboratory is a fully equipped, modern facility capable of a wide range of fuel tests, including flashpoint test, spectrometer, milipore, and Aquaglo. Initial LSU iterations had only a primitive (visual and Aquaglo) fuel testing capability and relied on test labs in Israel for sophisticated testing.
4. Equipment Entitlement Tables are the MFO equivalent of Tables of Organization and Equipment and Tables of Distribution and Allowance.
5. Hand receipts are the same automated outputs of the Standard Property Book System used by the US Army.
6. This is called "reserve fleet" by MFO but serves the function of a maintenance float.
7. Australian staff officers are being replaced by Canadians because of withdrawal of Australia from MFO and subsequent replacement by a Canadian Contingent.
8. Israeli Aircraft Industries provides major repair and rebuild of MFO helicopters and special coating of rotary blades to provide protection from sand-particle damage.
9. Includes US equipment only. Procedures are still being negotiated for turn-in and crediting of serviceable excess.
10. A nonexpendable item in MFO terms is:
 - o Any item with a unit price of over \$100.
 - o An item authorized on Equipment Entitlement Tables for which unserviceable turn-in credit has been received.
 - o A "sensitive" item approved for purchase by the MFO Standing Survey Board.
11. Not mentioned was medical support. Medical operations continued to evolve with maturity of the force and are not substantially different than operations in 1982.

CHAPTER VI

PRINCIPLES OF COALITION LOGISTICS

GENERAL

As has been indicated in Chapters 4 and 5, our study clearly indicates a remarkable correlation between logistics operations in the MFO now and the initial planning and operations in 1981 and 1982. It is evident that consumption factors were on target, use of commercial equipment has been an unqualified success, facilities suit force needs, the supply system has matured, and the force lives, operates, and sustains itself as envisioned by MFO planners. In fact, MFO is now regarded as one of the most successful peacekeeping operations in history and the logistics system that sustains it is a model for multinational force endeavors. Therefore, it is appropriate that we draw from the MFO experience the lessons that were learned in forming, deploying, and sustaining this unique force. The lessons learned apply to operations under austere conditions, into an immature theater, under severe time constraints, by coalition forces. This chapter outlines these lessons learned in the form of principles that we hope will guide those who plan similar operations. Let our experience with MFO serve to make their task easier.

PLANNING

It goes without saying that planning for a mission such as the MFO must be detailed and precise particularly in light of the difficult

environmental conditions in the area of operations. The following principles apply to the planning process:

o The support concept should be divided into distinct phases to take the force from concept development to maturity. Each phase should include those essential tasks required to accomplish stated goals and time lines to provide targets for completion. As an example, the Deployment Phase would include movement of contingents, actions to receive and house contingents on arrival, initial training, support requirements, etc. Subsequent phases could focus activities and priorities on initial operations, base development, and so forth. The phasing concept provides a common framework that focuses every contingent's efforts and allows decision makers to prioritize activities. Phasing could have been employed to a greater degree by the MFO.

o Direct contact between the logistics planners and logistics operators is essential and coordination of every facet of logistics operations must be discussed and agreed upon. Likewise, headquarters planners must have a point of contact on the ground in the area of operations to provide information or accomplish necessary coordination in the area on the planners' behalf.

o The backwards planning sequence is the best method to ensure that planning has been thorough and precise. Using this approach, the planner envisions the mature force and its logistics system and then applies those requirements through reverse time phasing to achieve the visionary system. This approach was used very effectively by MFO planners and is responsible for the high degree of correlation between initial plans and current operations discovered by our study.

o The logistics operators must deploy, acclimatize, stabilize, and become operational before other operating elements arrive in theater. If conditions do not permit this, an intermediate support arrangement must be developed. It is difficult for logistics operators to provide support and, at the same time, develop a support base. This becomes particularly acute when facilities are not available and initial stocks are delayed. The logistics operators should be able to receive, support, and sustain follow-on contingents.

o Although the force may be multinational, the logistics system must be common to all. In the case of the MFO, the US Army system was the model and was tailored to fit the needs of the force. The system should be standard, simple, and apply to all contingents. It is also preferable that the model used for the supply concept represent the national system best capable of providing resources.

o The majority of supplies are generic. Food is food. Sandbags are sandbags. Pencils are pencils. Therefore, the majority of the items stocked by the force will satisfy contingent needs. Standardization of equipment also enhances system commonality. Those

items that are not generic should be provided by the contingents themselves to satisfy their unique requirements.

o For MFO, using a combination of requesting items from the DOD supply system and purchases from commercial sources saved money and provided logistics staff and operators more flexibility. This approach allowed the force to get the best price and to energize the most responsive source of supply. As an example, tools for the support services contractor were purchased from Sears at a savings and were immediately available for shipment.

FACILITIES

Much was said about problems caused by construction delays in preceding chapters. A well thought-out construction plan that stays on schedule is critical to logistics operations. It must be recognized that delays experienced by the MFO were at times political, at times environmental, and always unavoidable. In addition, the deployment schedule was not negotiable; so, the force arrived to incomplete facilities. Nonetheless, there are some principles that apply:

o Facility availability must support the deployment schedule and be prioritized to fit mission requirements, i.e., complete petroleum storage tanks before the gym goes up. In addition, there must be backup alternatives when facilities schedules cannot support mission requirements. Worst case planning applies here.

o Warehouse facilities must be of sufficient size to provide a "surge" capacity of exaggerated stock safety levels during initial operations.

o Modular structures and standard OP/CP configurations were outstanding for efficient operations, soldier comfort, and cost. The modular structures have proven exceptionally durable and offer adequate protection for soldiers and operations. Standardized configuration (750-gallon water tanks, generators, fuel tanks) also ensure interoperability across the force and ease logistics support requirements.

o Construction of sector support sites to provide intermediate area support bases for satellite OP/CP's (petroleum and water primarily) was backup to breakdowns in the delivery system and provided a contingency stockage.

EQUIPMENT

Purchase of commercial, off-the-shelf equipment offered several distinct advantages over requiring participating contingents to provide their own unique equipment. In fact, MFO is now considering replacement of most of the US Battalion's tactical vehicle fleet with commercial items. This concept offers considerable value to future military operations, either national or coalition. Equipment lessons learned are:

o Purchase of commercial, off-the-shelf equipment offers distinct benefits:

- + It is less expensive.
- + It is readily available for immediate use.
- + It is easier to operate and maintain.
- + It is covered by warranty.
- + It allows standardization of diverse multinational elements.
- + Less operator training is required.
- + There is little, if any, degradation in mission performance.
- + It is technologically current, particularly communications.
- + Factory repair/service is available in most regions of the world. As an example, there is a Mack Truck Plant in Ashdod, Israel.

o Contingent-unique equipment should be kept to a minimum and must be supported by the owning contingent.

SUPPLY SYSTEM

Much has been said about the MFO supply system and its origins. The system continues to mature as succeeding logistics planners modify the logistics concept to better fit the needs of an evolving, mature force. The critical point, however, is that the system works, in spite of its

uniqueness. Principles for developing a supply system to satisfy the requirements of a coalition force are:

- o An entry point into the DOD supply system must be established. It is preferable if this interface joins the coalition force with a materiel management center that is close enough to provide customer service functions, such as reconciliations. The entry point for MFO was the 201st MMC at Camp Darby, Italy.

- o There must also be an interface with the DOD transportation system through Military Airlift Command, Military Sealift Command, or a commercial freight forwarder. The latter was the least expensive, most practical option for the MFO. Once selected, the freight forwarder must honor the DOD Issue Priority Designator System and must provide detailed shipping data to force logistics elements.

- o Intransit visibility is critical. There must be a reliable tracking system to allow the force to monitor shipping status and provide item visibility.

- o The logistics support unit should provide permanent liaison personnel to work with and assist supported contingents. This fosters good customer relations, provides an onsite trainer to teach the supply system, and smooths the flow of supplies. It is desirable if liaison personnel speak the language of the contingent to which they are assigned.

- o Logistics operators must provide comprehensive training for contingent logisticians on the supply system, distribution system, forms and records, etc. This training should be followed up with an aggressive customer service program.

- o The logistics concept must plan automation of supply records as soon as the theater is mature enough to support an automated system. Automated inventory records, property hand receipts, requisitions, and management reports are essential to efficient operations.

- o The logistics support unit should provide support to the contingents, not to subelements. Each contingent should be responsible to distribute supplies to subordinate organizations.

- o The logistics support unit must be a stable, nonrotational organization, unburdened to the greatest possible extent by personnel turbulence. One of the conceptual flaws in the MFO logistics system was wholesale rotation of the LSU every six months. This phenomenon caused many problems until the unit was stabilized.

- o Operations are enhanced by the assignment of multilingual support personnel.

- o The deployed force must have a local purchase apparatus and the authority and sufficient funds to provide support to contingents. This

is particularly important during initial operations and the need should lessen as the theater matures.

- o To the greatest extent possible, high volume, bulk items (petroleum, water, food, etc.) should be obtained from local sources. This practice reduces transportation costs and order-ship time. Acquisition costs, of course, must be reasonably equal to CONUS sources.

- o The support plan must be based on current consumption data for comparable operations (if available) or be calculated precisely. Minimum deviation should be allowed during initial operations or until sufficient demand data is available.

- o A civilian support services contractor can effectively support a deployed force with many of the functions now provided on CONUS posts/garrisons. However, the contractor's support plan must be carefully reviewed to ensure compatibility with the overall support concept, i.e., services tied to deployment schedule.

- o To protect resources from pilferage, property accountability must be established immediately and responsibility fixed.

- o Provision should be made for the availability of a storage facility to accommodate supply surges at sea- and airports.

- o Requisitioning activity must be monitored to ensure:

- + Excessive quantities are not requested.

- + Priority system is not violated.

- + Supply discipline is observed.

- o System design should detail flow of supplies from the origin to the user.

- o Contingency stocks should be sufficient in critical supplies to support "worst case" potential until demand data is developed.

- o As mentioned, subsistence is generic and can be supported from a single source (DOD system) and supplemented by local purchase to provide for contingent-unique requirements. Consumption guidelines to govern food service operations must also be developed to control quantities consumed by contingents to preclude inequitable consumption and accelerated stock attrition.

TRANSPORTATION

The role of transportation in support of an operation in an austere environment cannot be overstated. In fact, some supply problems when researched are actually caused by distribution breakdowns. Principles for providing transportation support are:

- o Accurate data on supply shipments and transport arrival dates is critical. The support concept must make provisions for this data.
- o Transportation assets must be sufficient to clear ports in a timely fashion to preclude loss of supply visibility.
- o Effective internal control of transportation assets via a movements control center is essential and must be incorporated in the support plan.
- o Contingents must be required to maximize use of their organic transport capability prior to seeking additional support.
- o Specialized equipment (bulk fuel trailers) should be centralized and operated by a transportation unit.

CONCLUSION

This study of the evolution of the MFO logistics system for the authors has been a "once in a lifetime experience." We have attempted to critically evaluate our own effectiveness in establishing a support system for the MFO. In some cases, we found our foresight lacking. But, for the most part, we found that the vision of 1981 has been reflected in the vast majority of the logistics operations in the MFO of 1986. We sincerely hope that our journey through the history of the development of the MFO support concept, the challenges we faced, the decisions we made, the mistakes we made, the successes we shared, and

the lessons we learned will help some unknown planner, in an unknown time, to better develop a support concept to support a coalition force. Then, and only then, will our effort be rewarded.

END

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