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# REPORT TO THE CONGRESS



LM097057

Airlift Operations Of The  
Military Airlift Command  
During The 1973  
Middle East War

*BY THE COMPTROLLER GENERAL  
OF THE UNITED STATES*

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APRIL 16, 1975



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

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(1) To the President of the Senate and the  
Speaker of the House of Representatives

This report evaluates airlift operations of the Military Airlift Command during the 1973 Middle East war and recommends ways to increase capabilities of the strategic airlift force.

We made our review pursuant to the Budget and Accounting Act of 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretary of Defense; and the Secretaries of the Army, Navy, and Air Force.

A handwritten signature in cursive script that reads "James B. Stacks".

Comptroller General  
of the United States

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ABBREVIATIONS

AFB	Air Force base
DOD	Department of Defense
GAO	General Accounting Office
JCS	Joint Chiefs of Staff
MAC	Military Airlift Command

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COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

AIRLIFT OPERATIONS OF THE  
MILITARY AIRLIFT COMMAND  
DURING THE 1973 MIDDLE  
EAST WAR  
Department of Defense  
Department of the Air Force

D I G E S T

WHY THE REVIEW WAS MADE

catr Congressman Lucien N. Nedzi asked  
GAO to:

- Make a comprehensive review of the performance of the U.S. military airlift to Israel during the 1973 Middle East war.
- Evaluate effectiveness of C-5 aircraft from perspectives of both cost and military requirements.
- Determine any problems in airlifting outsize cargo--cargo which is so large that it can be carried only by C-5 aircraft.

GAO expanded the review to evaluate total airlift operations of the Military Airlift Command in order to fulfill GAO's responsibility of reporting to the Congress on major Federal activities.

FINDINGS AND CONCLUSIONS

The Military Airlift Command did an outstanding job in the airlift even though

- advance planning was inadequate;
- certain European and African countries denied vital landing, staging, and overflight rights; and
- the Command's authority to manage the airlift was limited. (See p. 34.)

Most of the airlift occurred from October 13 to November 14, 1973, when the Command's aircraft delivered 22,497 short tons of materiel to Israel. However, only 39 percent of the materiel was delivered before the cease-fire agreement on October 24. Also, Israel used eight of its commercial aircraft to move 5,500 tons of cargo from on-loading points in the U.S. (See p. 8.)

Four factors determining the mix of aircraft used in the airlift were

- limitations by the Secretary of Defense on the number of each type of aircraft allowed to land each day at Lod Airport, Tel Aviv, Israel,
- requirements to move outsize cargo,
- time limitations, and
- saturation of ground facilities at Lajes Air Base, Azores, and Lod. (See p. 9.)

The airlift had only a minor effect on the Command's normal peacetime operations and by no means taxed its overall capability. The Command did not commit more than 24 percent of its aircraft to the airlift on any one day. (See pp. 16 and 35.)

After diverting aircraft from scheduled cargo routes during the airlift, the Command purchased commercial airlift at a cost of about \$5.5 mil-

lion. At the same time as they were purchasing commercial airlift, the Command had an average of 7 C-5 and 46 C-141 operable aircraft that did not fly any missions. (See pp. 20 to 22.)

In GAO's opinion, the Israeli airlift cannot be used to measure U.S. capability to respond to an all-out war because the number of men and amount of materiel airlifted to Israel were very small compared with U.S. airlift capability. (See p. 35.)

#### Evaluation of C-5 aircraft

C-5 aircraft did an excellent job of airlifting materiel. Although C-5s made only 147 of the 569 flights to Israel, they carried nearly half of the total tonnage airlifted--10,757 tons. (See pp. 10 and 35.)

One unique feature of the C-5 is its capability to move outside cargo. This feature was well demonstrated by the 43 flights to Israel, which carried 72 outside items--mostly combat tanks and self-propelled howitzers and guns. However, most did not arrive until after the cease-fire or after the first ship had arrived. (See pp. 10 and 11.)

Aerial delivery of combat tanks and other outside cargo by C-5s was an impressive use of airlift capability, and it is impossible to assess the psychological impact of these flights.

In GAO's opinion, however, the relatively small quantities of outside equipment delivered in this manner had no decisive effect on the war's outcome.

Except for outside cargo, the airlift could have been conducted with-

out C-5 aircraft. However, this would have disrupted the Command's other airlift operations. (See p. 34.)

#### Operational readiness

Sixty percent of the Command's C-5 aircraft and 35 percent of the C-141s were inoperable because they needed maintenance or parts. These problems did not prevent accomplishment of any missions because many more aircraft than needed were available.

Operational readiness of the C-5s should increase as more systems are stabilized and as adequate spare parts are purchased to support these systems. (See pp. 12 and 35.)

#### Costs of the airlift

According to the Foreign Military Sales Act of 1968, the United States is to recover the total cost incurred for goods or services provided to foreign governments.

In billing airlift services, not all costs were included, and Israel was billed about \$45.1 million less than the total cost of the services. The Air Force, however, believes that the amount underbilled was only about \$14.1 million. (See p. 27.)

Ton-mile costs for the C-5 and C-141 aircraft were 40 cents and 20 cents, respectively. At the same time, a commercial cargo-configured B-747 provided service at a ton-mile cost to the Command of only 11 cents. Properly configured aircraft of this type would be a valuable asset to the U.S. strategic airlift force in the event of a general war in Europe or Asia. (See pp. 27 and 28.)

Lessons Learned

Although the airlift was successful, the Command learned a number of valuable lessons. Pointed out was a need for

- in-flight aircraft-refueling capability,
- a logistics contingency plan for operations in the Middle East,
- improved management of airlift resources, and
- improved command-and-control elements and communications. (See p. 30.)

RECOMMENDATIONS

The Secretary of Defense should establish a contingency operation plan for the Middle East that would provide for overall logistic support, including strategic airlift to support U.S. interests in that area.

Such a plan should allow the Military Airlift Command to manage movement of cargo and personnel and to control flow of aircraft in future strategic airlift operations, within overall limits established by higher authorities. (See p. 35.)

3  
/ The Secretary of the Air Force 35  
should bill the Government of Israel for all costs--funded and unfunded--of the airlift services provided, including depreciation on a basis consistent with the method established by the Airlift Service Industrial Fund and industry practices. (See p. 36.)

AGENCY ACTIONS  
AND UNRESOLVED ISSUES

The Department of Defense said GAO's report is basically factual and

accurate. However, it did take issue with some interpretations of the facts presented. These areas of difference are discussed in the report.

The Department of Defense described a number of steps being taken by the Air Force and the Military Airlift Command to

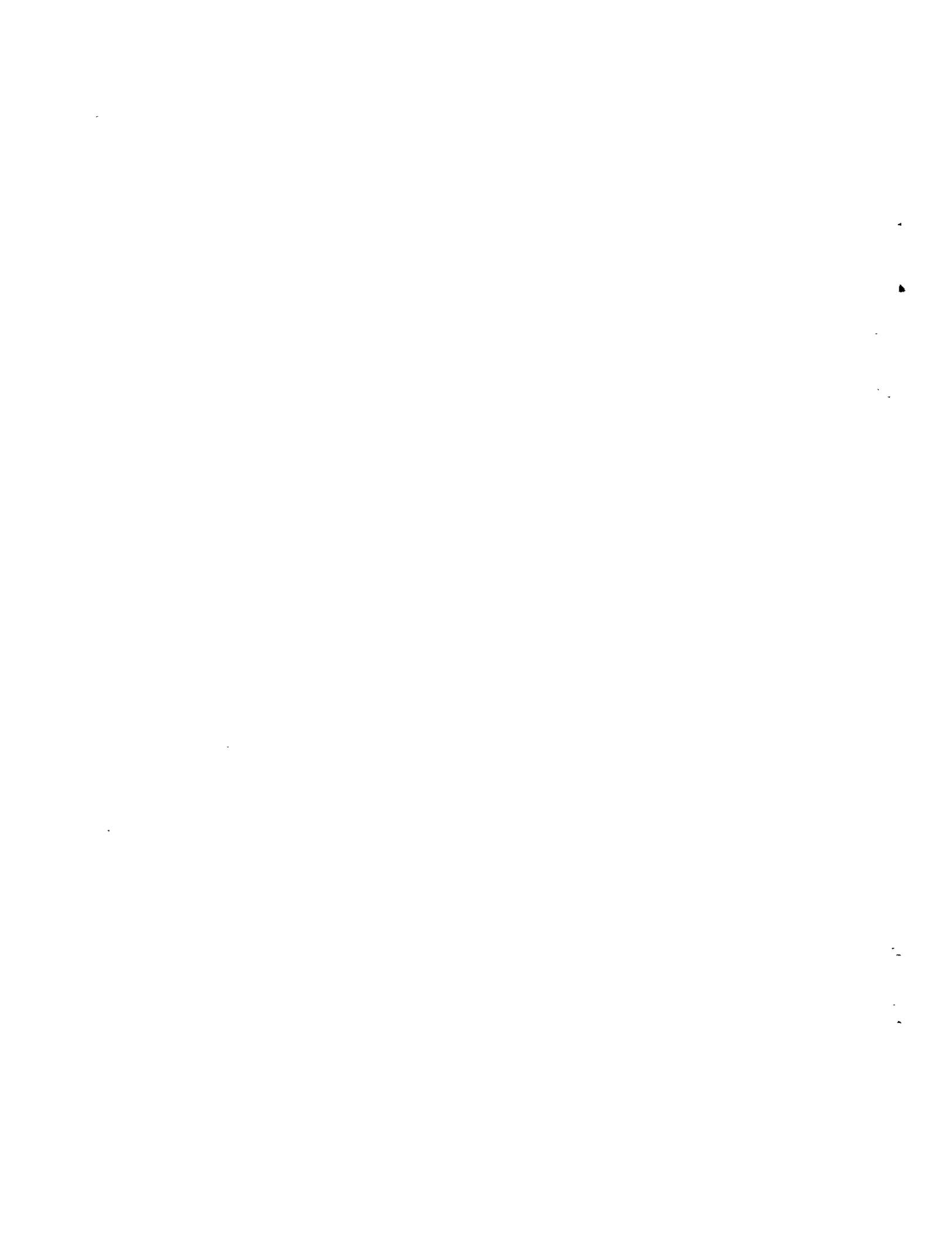
- improve the operational readiness of the U.S. strategic airlift aircraft,
- provide an operational in-flight refueling capability for C-5 aircraft,
- improve command-and-control operations for emergency situations.

GAO believes these efforts should be continued.

The Air Force has billed Israel an additional \$14.1 million for airlift services. This amount includes depreciation on a daily basis rather than on a flying-hour basis recommended by GAO. Interest on the Government's investment has not been billed because applicability of this cost is still being studied by the Department of Defense. (See app. XV and XVI.)

MATTERS FOR CONSIDERATION  
BY THE CONGRESS

The Congress may wish to consider matters in this report during future hearings on the Air Force's budget, particularly the increased strategic airlift capacity available from improving the current operational readiness posture of the C-5 aircraft.



## CHAPTER 1

### INTRODUCTION

#### MILITARY AIRLIFT COMMAND

The Military Airlift Command (MAC), a major command of the U.S. Air Force, is the single Department of Defense (DOD) operating agency for airlift services. Its primary mission is to provide the airlift necessary for wartime deployment of U.S. fighting forces and their equipment. This mission has three parts: (1) to be trained and ready to deploy fighting forces anywhere in the world, (2) to augment the tactical airlift capability of Air Force commanders, and (3) to provide sustained logistical support to the fighting forces.

MAC also provides aeromedical evacuation service to DOD personnel; special-mission airlift for the President and for U.S. and foreign dignitaries; and global support services through its Air Weather Service, Aerospace Rescue and Recovery Service, and Aerospace Audio-Visual Service.

MAC headquarters at Scott Air Force Base (AFB), Illinois, is responsible for directing activities of the strategic airlift force. Operational control of the force is vested in the 21st and 22d Air Forces located at McGuire AFB, New Jersey, and Travis AFB, California, respectively. Each Air Force is responsible for strategic airlift activities in half the world. Under these Air Forces are wings and squadrons located in the United States and overseas that carry out the day-to-day functions necessary to operate a global airlift service.

To carry out its primary mission, MAC was assigned 77 C-5 Galaxy aircraft and 276 C-141 Starlifter aircraft. Photographs of a C-5 and a C-141 are shown on pages 4 and 5 respectively. These aircraft are assigned to the 21st and 22d Air Forces and to the 443d Military Airlift Wing, a MAC aircrew training organization located at Altus AFB, Oklahoma. (See app. I.)

The total MAC operating budget for fiscal year 1974 was \$1.7 billion, of which \$717 million was for the Airlift

Service Industrial Fund. This fund is used to finance most airlift expenses; the major exceptions are the unfunded costs for military pay and aircraft depreciation. For the same fiscal year, military pay for airlift operations amounted to more than \$278 million and aircraft depreciation amounted to \$270 million. Of the 53,407 military and 15,449 civilian personnel assigned to MAC, 22,909 military and 4,164 civilian personnel were assigned to strategic airlift functions.

MAC provides airlift services primarily to meet four separate requirements.

Joint Chiefs of Staff (JCS) exercises. This airlift supports JCS directed or coordinated activities designed to determine the ability of participants, including allied nations, to carry out their wartime missions.

Joint airborne and air transportability training. This airlift maintains the joint proficiency of MAC, Army, and Marine Corps units in aircraft loading and unloading and airdrops of personnel and cargo.

Channel traffic. This is scheduled airlift over established routes for moving personnel, cargo, and mail. It is provided by MAC military airlift squadrons and commercial carriers under contract to MAC. Airlift provided by the squadrons is a byproduct of MAC's training and proficiency flying programs. The service is offered to DOD components and other authorized agencies, and MAC recovers a large part of the expenses incurred. Channel routes operated by MAC are shown in appendixes II and III.

Special-assignment airlift missions. Customers lease aircraft to airlift cargo and personnel from points of origin, or to destinations, not normally served by MAC channels. Military and commercial aircraft provide this service, and MAC is reimbursed at established hourly rates, depending on the type of aircraft provided. This

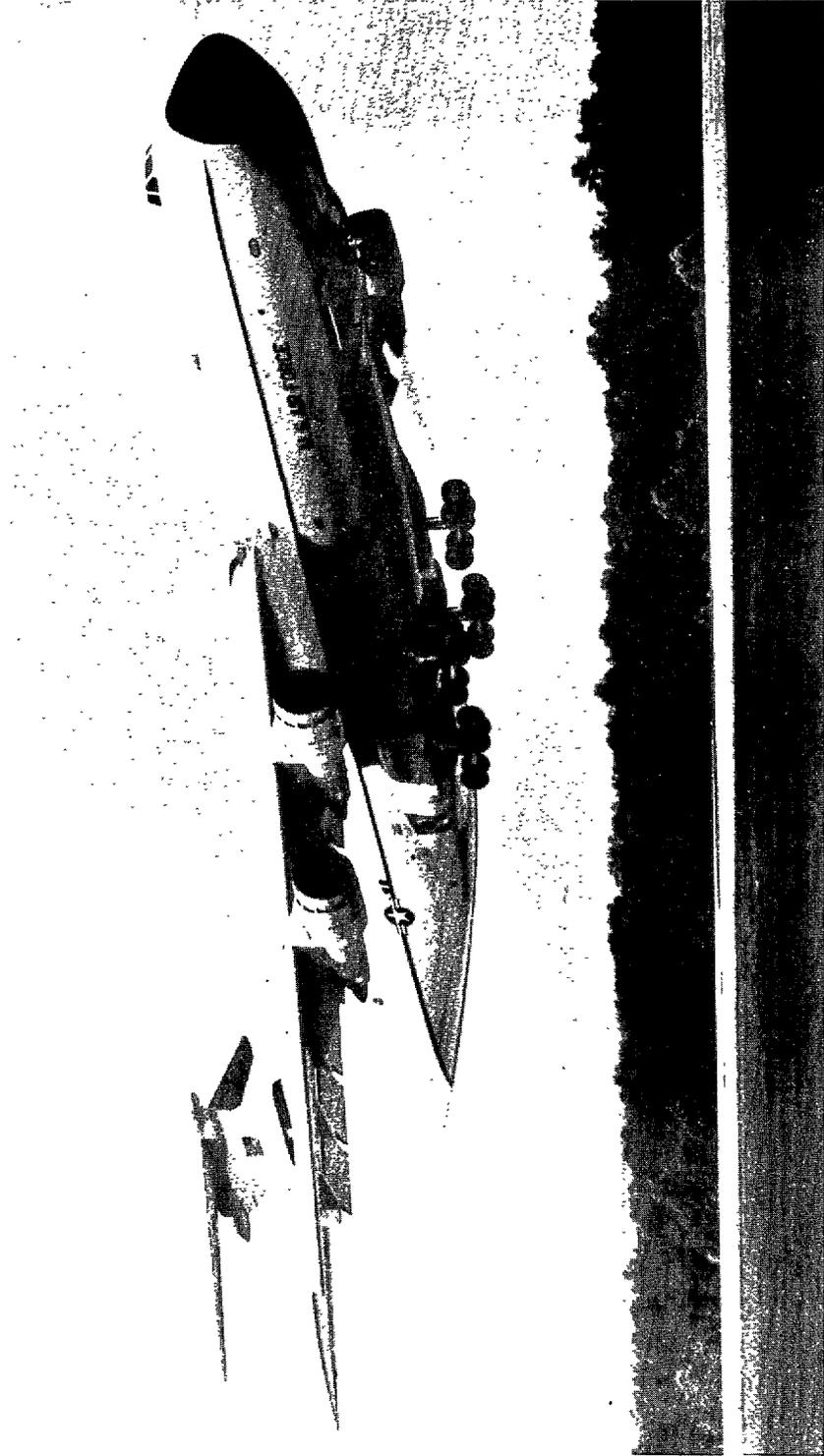
service was used to airlift supplies and equipment to Israel during the 1973 Middle East war.

CAPABILITY AVAILABLE TO  
SUPPLEMENT MAC'S FORCES

MAC's active military force is augmented by the Air Force Reserve and the Air National Guard. The Reserve Associate Program organizes reserve units at MAC airlift locations to fly, maintain, and share the equipment of their host active duty units. The program provides the necessary training of reserve aircrews and maintenance and airport operational personnel. When fully activated, an associate airlift squadron will augment each of MAC's airlift squadrons to meet wartime manpower requirements.

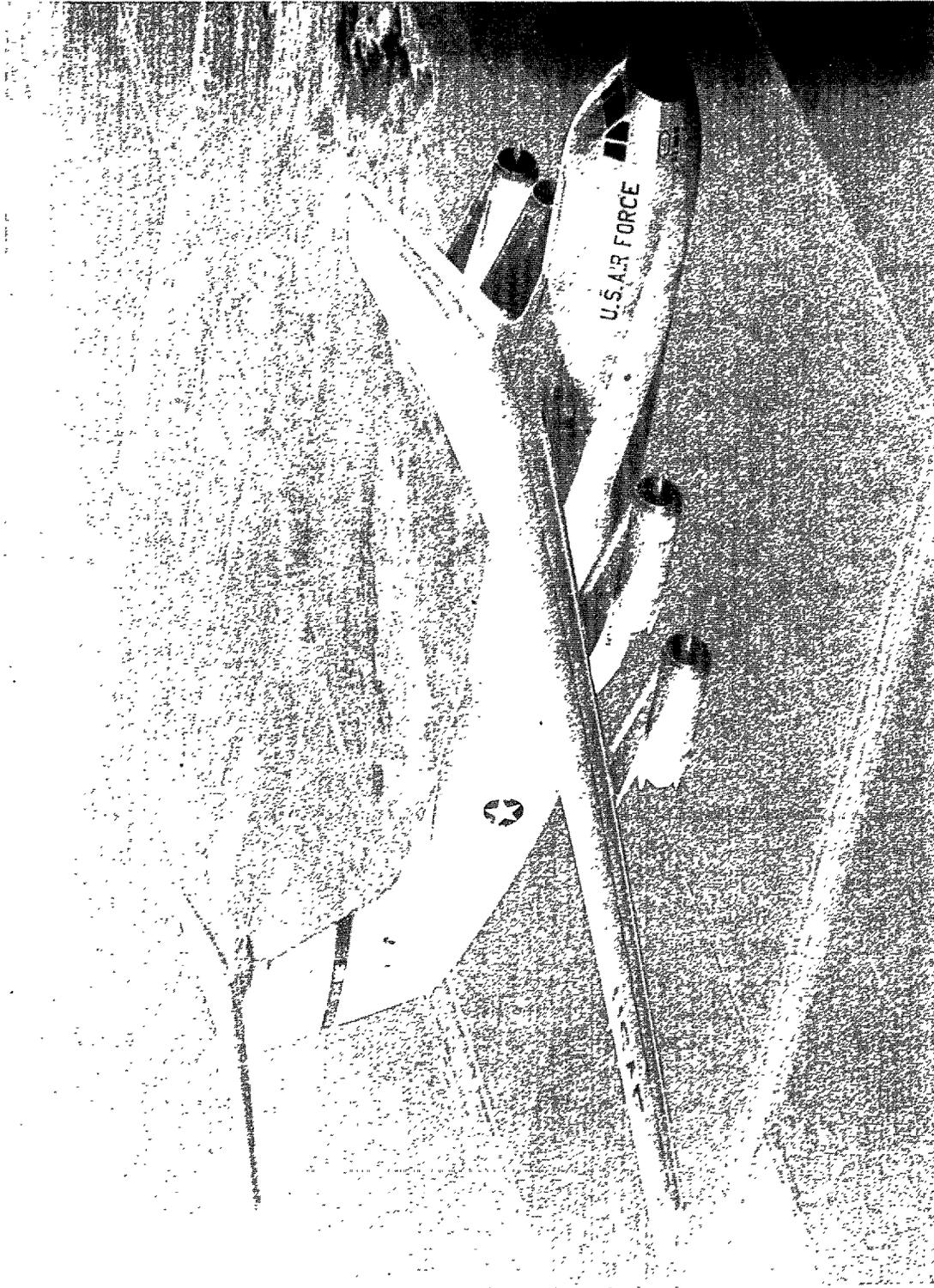
A large part of the U.S. strategic airlift resources is the Civil Reserve Air Fleet, established in 1952. This fleet provides for using specific U.S. civilian aircraft to augment airlift in emergencies or national crises. The fleet, or any part of it, may be mobilized in stages by the MAC commander, the Secretary of Defense, or the President and the Congress, depending on the gravity of the situation. It has never been necessary, however, to use any part of the fleet. During the Middle East war, for example, the fleet was not activated because MAC had the capability to carry out the airlift.

As of October 1974, the fleet consisted of 345 aircraft from 20 U.S. civilian air carriers. These aircraft represented 78 percent of the U.S. international cargo fleet, 35 percent of the domestic cargo fleet, and 15 percent of the U.S. international passenger fleet. Included are 245 long-range international aircraft, of which 90 are passenger and 155 are cargo aircraft. The latter are mostly B-707-300C and DC-8-50F and DC-8-60F aircraft.



C-5 aircraft

(See app. IV for aircraft performance and characteristics.)



C-141 aircraft

(See app. IV for aircraft performance and characteristics.)

## CHAPTER 2

### STRATEGIC SUPPORT OF ISRAEL

From the outset of the 1973 Middle East war, U.S. officials became involved in determining to what extent the Government should support Israel. The White House, the National Security Council, and the Departments of State and Defense considered the options available in light of the importance of the Middle East and U.S. commitments to the countries involved.

Because DOD did not have a logistics contingency operation plan for Israel, its support had to be planned and directed on an ad hoc basis. Determining the method of delivering the materiel in time was a troublesome problem and caused delays.

On October 12, 1973, President Nixon directed DOD to begin an airlift to Israel immediately. The U.S. military airlift began on the following day and was generally completed 33 days later. MAC did an outstanding job even though advance planning was inadequate; certain European and African countries denied the United States vital landing, staging, and overflight rights; and MAC's authority to manage the airlift was limited.

### CHRONICLE OF EVENTS

On October 6, 1973, Egyptian Armed Forces crossed the Suez Canal at three points and attacked Israeli positions in the Sinai Desert. At the same time, Syrian Armed Forces overran Israeli-occupied positions in the Golan Heights. The Israelis were greatly outnumbered in both manpower and equipment. The situation was aggravated further on October 10 when the Soviet Union began a massive airlift of weapons and supplies to Egypt and Syria.

The United States has been committed to the survival of the Republic of Israel since its birth in 1948. This longstanding commitment has been reaffirmed by every President since Truman. Moreover, under the Nixon Doctrine, the United States is obligated to support friendly countries by

providing the military equipment and supplies needed to help them defend themselves.

DOD did not have a logistics contingency operation plan to support Israel. According to DOD, Israel refused to provide the information necessary for the United States to develop such a plan and the Congress had not approved the procurement of stocks for such a purpose. (See app. XV.) As a result, the support had to be planned and directed on an ad hoc basis. This caused delays because determining the method of delivering the materiel to Israel in time was a troublesome problem.

Various delivery methods that would not require military airlift forces to enter the war zone were considered. Sealift was considered but rejected because it was estimated that it would take 30 days to meet Israel's requirements. However, sealift was eventually used to deliver about 74 percent of the materiel.

U.S. commercial air carriers were asked to augment the small Israeli fleet being used to airlift materiel from the United States. The international scheduled carriers were opposed to furnishing such airlift unless the Civil Reserve Air Fleet provisions were involved, primarily because U.S. military aircraft were not operating in the war zone and because the Arabs were expected to retaliate.

Also considered was the movement of equipment and supplies using military aircraft from onloading points in the United States to east coast locations for transshipment to Israel by its aircraft. Using Lajes Air Base, Azores, as a transshipment point was also considered. These methods were abandoned because the Israeli fleet could not expeditiously move the cargo to Israel.

On October 12, 1973, before a decision was made on the method of airlifting materiel to Israel, its Prime Minister sent an urgent message to President Nixon requesting immediate assistance. It was pointed out that Israeli supplies were running low and that Israel's fate was in serious doubt. That day, the President directed DOD to immediately begin an airlift to Israel and Air Force headquarters instructed the MAC commander to prepare for the airlift but to move nothing from the United States. MAC then

(1) activated its Headquarters Contingency Support Staff and directed that such staffs be formed at its subordinate airlift commands, (2) authorized increases in aircraft utilization rates, and (3) canceled all routine flight training. The 21st Air Force was designated as the controlling element for the airlift.

JCS directed MAC, through Air Force headquarters, to start airlifting cargo immediately for offloading at Lajes Air Base. Accordingly, arrangements were being negotiated with Portugal to use Lajes as a transshipment point and to have Israeli aircraft pick up the cargo. On the following day, DOD announced that Lajes could be used for the airlift. Later the same day, the Secretary of Defense directed that the airlift would operate to Israel using MAC aircraft and that Lod International Airport near Tel Aviv would be the offloading point.

The airlift began on October 13 and was completed on November 14, 1973, except for two flights. Fifty-one C-5s and 177 C-141s delivered 22,497 tons of materiel to Israel. Only 39 percent of the materiel was delivered before the cease-fire agreement on October 24. Also, Israel used eight of its commercial B-707 and B-747 aircraft, only two of which were cargo configured, to move 5,500 tons of cargo from onloading points in the United States.

The extent of materiel support was controlled by the Secretary of Defense through JCS. The Secretary, in coordination with the Department of State and various DOD elements, reviewed the types and quantities of materiel requested by Israel. Logisticians from each of the military services also reviewed the requests to determine their impact on the war and U.S. military posture. As the requests were approved, JCS directed the services to provide materiel and designated the type of transportation to be used. For the most part, materiel was designated for airlift by the logisticians on the basis of Israel's immediate requirements.

All of MAC's military airlift wings participated in the airlift. Also participating were the MAC training wing at Altus AFB, a few full aircrews, and a few individual crewmembers of the Reserve Associate wings.

### ONLOADING POINTS AND ROUTES FLOWN

Equipment and supplies to be airlifted to Israel and equipment needed to support the airlift were onloaded at 29 locations in the United States, principally military air bases. (See app. V.) In addition, supplies and equipment were onloaded at Lajes Air Base and in West Germany.

The airlift route (see app. VI) was from various points in the United States to Lajes, then to a point over the Strait of Gibraltar, then east over the Mediterranean Sea to the vicinity of Crete, then southeast to Tel Aviv. On October 22, 1973, MAC changed the route to fly south of Crete, to comply with a request from the Greek Government. MAC exercised extraordinary care to comply with flight restrictions; flights originating in West Germany were routed to Lajes, then through the Mediterranean area to Lod Airport. This zigzagging route was used because the United States could not obtain diplomatic clearance to use bases, which MAC usually used, in the United Kingdom, Spain, Italy, Greece, and Turkey. Also, the aircraft had to avoid overflying land masses and had to stay out of airspace controlled by Arab countries.

### AIRLIFT CONSTRAINTS

According to MAC, the maximum number of aircraft that could pass through Lajes Air Base, the choke point of the authorized route, during a 24-hour period, was 6 C-5 and 36 C-141 aircraft in each direction, or a total of 84 flights. Although this number could have flown through Lajes and offloaded at Lod Airport, the Secretary of Defense maintained control of the airlift and limited the number of aircraft that could land at Lod Airport each day. The largest number of aircraft which MAC was allowed to land at Lod Airport was 23--6 C-5s and 17 C-141s.

Therefore, MAC's authority to determine the type and number of aircraft to use was restricted to the segment of the airlift from the United States to Lajes. Moreover, the type of aircraft which MAC could use was governed by requirements to move outsize cargo, time limitations, and saturation of ground facilities at Lajes and Lod.

### CHAPTER 3

#### ROLE AND OPERATIONAL PERFORMANCE OF THE C-5 AIRCRAFT

The C-5s played a major role during the airlift. Although they made only 147 of the 569 flights to Israel, they delivered nearly half of the total tonnage airlifted. These flights could have carried maximum loads from the United States directly to Israel if in-flight refueling capability had been available.

Forty-three of the flights carried outside cargo. Most of this cargo did not arrive until after the cease-fire or until after the first ship had arrived. While it is impossible to determine the psychological impact of airlifting these items to Israel, we believe the quantities delivered were not significant enough to have affected the war's outcome.

Sixty percent of the C-5s were inoperable because they needed maintenance or parts. These problems did not prevent the accomplishment of any missions because the number of operable aircraft always exceeded the number required for missions.

#### C-5 AIRLIFT FLIGHTS

Of 170 C-5 flights involved in the airlift, 7 ended at Dover AFB, Delaware; 16 at Lajes Air Base; and 147 at Lod Airport. The latter delivered 10,757 tons of materiel to Israel. Most of the flights operated to Dover, then to Lajes. However, some flights operated from points in the United States directly to Lajes. In addition, one C-5 moved cargo from West Germany. All flights to Israel were routed through Lajes where the aircraft were serviced, refueled, and maintained, and where aircrews were changed.

The C-5 is capable of carrying 107 tons of cargo. The average load carried was 73.2 tons and the heaviest load was 98.7 tons. Maximum loads could have been carried from the United States directly to Israel if in-flight refueling capability had been available.

Without the use of en route facilities, the C-5s would have had to fly nonstop from the United States to Israel. This would have limited their payloads to only 33 tons. Furthermore, it is questionable, depending on headwinds and other weather conditions, whether the aircraft had the capability of returning without refueling. The C-141s could not even have made the trip without refueling en route.

Appendix VII lists the equipment and supplies loaded on the C-5s at the various locations in the United States, West Germany, and Lajes.

#### OUTSIZE EQUIPMENT AIRLIFTED

One unique feature of the C-5s is their capability to transport outsize cargo. Twenty-nine percent of the C-5 flights carried outsize equipment to Israel. These flights moved 9 percent of the total tonnage delivered by air. However, only 14 outsize pieces of equipment were airlifted before the cease-fire agreement.

Twenty-nine battle tanks made up almost 69 percent of the outsize tonnage airlifted. In airlifting 25 of these tanks after the cease-fire, MAC headquarters provided guidance for selecting the aircraft to be used. This was done to insure that aircraft with minimum restrictions, few flying hours, and few landings were selected for the flights. The movement of outsize equipment, before and after the cease-fire agreement, is shown in appendix VIII.

The first ship reached Israel on November 2, 1973, with 3,321 short tons of outsize equipment, including battle tanks, self-propelled howitzers, and cargo trucks. By that date C-5s had delivered 1,257 tons of outsize equipment. Outsize equipment airlifted and sealifted to Israel as of November 2 is shown in appendix IX.

Except for the outsize aircargo, the entire airlift could have been conducted using only C-141s. But this would have disrupted other MAC airlift operations. Furthermore, DOD officials stated that the airlift--especially the airlift of outsize cargo--demonstrated to all nations that the United States had not only the capability to airlift

combat equipment and supplies but also the will to do so in an emergency. A secondary purpose was to provide a "shot in the arm" to Israeli morale. (See app. XV.) Photographs and characteristics of most outsize equipment airlifted are shown in appendix X.

#### INOPERABLE C-5 AIRCRAFT

An average of 46, or 60 percent, of the C-5s assigned to MAC were inoperable each day of the airlift.

--22 percent were in depot maintenance.

--25 percent were in unit maintenance.

--13 percent were inoperable due to a lack of parts.

Thirty-five percent of the C-141 aircraft were inoperable for the same reasons. These problems did not prevent the accomplishment of any missions because the number of operable aircraft always exceeded the number required for missions.

According to MAC maintenance officials, several aircraft reported as inoperable could have been made operational within a short period, if necessary. Daily operational status reports estimated that an average of eight inoperable aircraft could have been placed in an operational condition within 12 hours of the reporting time. The operational status of the C-5s and C-141s is shown in appendixes XI and XII, respectively.

#### Aircraft in depot maintenance

Seventeen C-5s, or 22 percent of those assigned to MAC, were in depot maintenance for scheduled inspections, repairs, and modifications. The C-5s are flown to either Kelly AFB, Texas, or Dobbins AFB, Georgia, for such maintenance.

The depot maintenance program was not accelerated to provide more operational C-5s. Nor were C-5s withheld from depot maintenance to have additional aircraft available.

### Aircraft needing unit maintenance

Nineteen, or almost 25 percent, of the C-5s were inoperable because they needed squadron- or wing-level maintenance. The Air Force had a standard of 24 percent for this kind of maintenance before 1970. The standard, however, was not accepted for the C-5s.

The maintenance rate for the C-5s exceeded that for the C-141s. MAC officials, explaining that a comparison of the rates for the two aircraft was not reasonable, said the sheer size of the C-5s increased maintenance problems. They explained that the C-5s' major systems and subsystems, as well as the airframes, are extremely complex and that their designs are at the upper limits of the state of the art.

### Aircraft needing parts

Ten C-5s, or about 13 percent, were inoperable due to a lack of parts. The Air Force has not established a standard for this category of C-5 inoperability, but before 1970, it had a goal of 5 percent for most other aircraft. Although this inoperable rate was much higher than that for the C-141, MAC officials explained that the rates for the two aircraft could not be meaningfully compared.

The unavailability of spare parts for the C-5s stemmed, in part, from the concurrent development and production concept under which the aircraft were acquired. This precluded the accumulation of historical data on which to base a sound spare-parts procurement program. Many C-5 systems and subsystems were not fully developed, and it was recognized that they would be modified or replaced. Furthermore, in testing and in initial operations, many components had high failure rates. Therefore, to avoid a sizable investment in low reliability and unusable spare parts, a full range and depth of supply support was not procured. Moreover, the C-141s are tried and tested, having been in service more than 10 years.

### Cannibalization

Cannibalization is the removal of a part from one aircraft, usually inoperable, for installation on another aircraft to make the latter operational to meet mission requirements. It is used either because a needed part is not available or because the part cannot be promptly provided by the supply system. Cannibalization is recognized as an acceptable and justifiable practice when properly controlled.

In October and November 1973, about 1,000 items a month were cannibalized for C-5 aircraft, or an average of 16.8 items for each aircraft. This was an increase over the preceding 3 months, when 600 items a month were cannibalized. The increase resulted mainly from an increase in C-5 flying hours. (See ch. 4.) However, some of the increase resulted from "cannibalization for convenience," which occurs when a needed part is available in the supply system but is more accessible from another aircraft. Such action prevents excessive delay and/or transfer of cargo from one aircraft to another.

### Terminated flights

Of 894 C-5 flights launched during the airlift, 30, or only 3.4 percent, were not completed. All but one of the terminated flights were caused by mechanical malfunctions, and two of the aircraft were diverted en route. Only 1.2 percent of the C-141 flights were terminated.

### Delayed departures

Eighty-four C-5 flights were delayed 855 hours. Forty delayed departures were caused by mechanical malfunctions. The other delays were caused by such conditions as congestion, traffic control restrictions, weather, and saturation of servicing facilities. Of the C-141 flights, 119 were delayed 880 hours.

### Turnaround time at Lod Airport

One important measure of the effectiveness of aircraft in an airlift is the time required to "turn an aircraft around"--the interval between landing and takeoff at a

destination. Of the 147 C-5s which landed at Lod Airport, 80 were turned around in less than 2.5 hours. The times ranged from less than 1 hour to more than 40 hours. The average turnaround time was 3.6 hours. This included unloading; refueling; servicing; minor maintenance; and, in some instances, aircrew rest. The relatively short time is attributable, in part, to the C-5s capability to lower its cargo deck to within about 6 feet of the ground, to facilitate offloading fore and aft and to allow self-propelled equipment to be driven off the aircraft. Turnaround time for the C-141s averaged 1.7 hours. Their average payloads, however, were only about 38 percent of those delivered by the C-5s.

## CHAPTER 4

### EFFECT OF THE AIRLIFT ON PEACETIME OPERATIONS

The airlift had only a minor effect on MAC's normal peacetime operations. No more than 24 percent of MAC's strategic aircraft were committed to the airlift on any one day. The number of C-5s used each day ranged from 6 to 27, while an average of 30 C-141s were used daily.

Concurrent with the airlift to Israel, MAC continued to carry out all other DOD requirements, including operating channel routes, supporting JCS and joint airborne exercises, and providing airlift to meet special needs of users. To meet these requirements and simultaneously operate the Israeli airlift, MAC took the following actions.

- Personnel and equipment were deployed to onloading, intransit, and offloading points.
- Aircrew flying requirements were modified.
- Flying-hour programs were adjusted within authorized levels.
- Aircraft were diverted from scheduled cargo routes.
- Additional airlift capability was purchased.
- Some airlift capability was obtained from another Air Force command.

### DEPLOYMENT OF PERSONNEL AND EQUIPMENT TO SUPPORT THE AIRLIFT

In peacetime MAC airlift personnel and support equipment are assigned to aerial embarkation and debarkation ports and to en route stations that its regular channel routes traverse. Flights operated in the Israeli airlift did not always originate at MAC ports, nor did they follow established channel routes. Therefore, MAC was required to deploy personnel and equipment to major onloading points, the intransit point, and the offloading point that were not sufficiently manned. Early in the airlift, MAC deployed

airlift control elements--teams of technical personnel qualified to control, coordinate, and report on airlift operations. These teams had 689 military personnel, of which 425 were assigned to Lajes Air Base, 209 to four Air Force bases in the United States, and 55 to Lod Airport. Although Lajes Air Base was used for MAC operations before the airlift, it is not a principal channel route station. Thus, to support the appreciable increase in aircraft flow at Lajes, it was necessary to greatly supplement the personnel stationed there.

MAC airlift aircrew duty time is limited to 16 hours which must be preceded by at least 15 hours of ground time. Round trips between U.S. points and Lod Airport took 30 hours or more. Therefore, aircrews were staged at Charleston, Dover, and McGuire AFBs and at Lajes Air Base to shorten continuous duty time, maximize the use of aircraft, and expedite movement of materiel to Israel.

MAC also had to augment the basic flight crews with pilots, navigators, engineers, and loadmasters. This was required because the round trip between Lajes and Lod Airport took 20 or more flight hours, which was in excess of the crew duty time.

Other actions taken by MAC to increase available crewmembers were:

- Crewmembers were given the option to return to rest status if not alerted for departure within 6 to 10 hours after the initial rest period was waived.
- Uninterrupted crew rest before reporting for departure was reduced from 12 to 8 hours.
- Required en route ground time was reduced from 15 to 12 hours.
- Postmission crew rest was eliminated.
- Maximum flying time was increased to 150 hours for a 30-day period.

Equipment airlifted to support personnel included material-handling equipment, radio and other communications gear, parts kits, maintenance stands, and tools. Communications equipment was provided and manned by Air Force Communications Service personnel. Also, the Air Weather Service and the Air Rescue and Recovery Service deployed personnel and equipment to support the airlift.

EFFECT OF THE AIRLIFT  
ON FLYING-HOUR PROGRAMS

MAC receives flying-hour programs from the Air Force for each fiscal year. The purpose of the programs is to keep the strategic airlift force ready to carry out MAC's primary mission. (See p. 1.) The flying hours authorized are used to train aircrews and maintenance, support, and command-and-control personnel.

They also provide the capability to support JCS and joint airborne exercises and special user requirements.

The C-5 program for fiscal year 1974 is shown below.

<u>Quarter</u>	<u>Flying-hour program</u>			<u>Hours flown</u>		
	<u>Initial</u>	<u>Revised 10-1-73</u>	<u>Revised 1-1-74</u>	<u>Total</u>	<u>Israeli airlift</u>	<u>Other missions</u>
First	14,942	14,942	14,942	11,902	-	11,902
Second	16,094	14,134	14,134	13,522	4,967	8,555
Third	16,094	14,134	13,014	7,414	-	7,414
Fourth	<u>17,462</u>	<u>15,502</u>	<u>14,274</u>	<u>14,324</u>	<u>-</u>	<u>14,324</u>
Total	<u>64,592</u>	<u>58,712</u>	<u>56,364</u>	<u>47,162</u>	<u>4,967</u>	<u>42,195</u>

The program was reduced as of October 1, 1973, because the airdrop mission previously assigned to the aircraft was waived. The energy crisis caused decreases in the third and fourth quarters for the Active Forces, but the Reserve Associate program was increased for the last quarter.

As shown in the tabulation, the Israeli airlift was operated within the authorized program. Moreover, only about 11 percent of the hours flown were used in the airlift. In the second quarter, when the Israeli airlift occurred, the program was underflown 600 hours. However, in October and November, the months of the airlift, the program was exceeded by 1,800 hours.

During the fiscal year, the aircraft were flown about 9,200 hours less than programmed. This resulted mainly from underflying the program in the first and third quarters. According to MAC officials, the first quarter was underflown because the loss of the airdrop mission was anticipated and because the pattern of cargo generated was not economically compatible with the aircraft. The third-quarter program was underflown because the energy crisis affected airlift users and because cargo requirements did not materialize.

The fiscal year 1974 flying-hour program for the C-141 aircraft was as follows:

<u>Flying-hour program</u>			<u>Hours flown</u>		
<u>Quarter</u>	<u>Initial</u>	<u>Revised 1-1-74</u>	<u>Total</u>	<u>Israeli airlift</u>	<u>Other missions</u>
First	82,889	82,889	89,104	-	89,104
Second	82,329	82,329	84,364	13,584	70,780
Third	82,729	76,411	60,076	-	60,076
Fourth	<u>82,889</u>	<u>76,331</u>	<u>76,787</u>	<u>-</u>	<u>76,787</u>
Total	<u>330,836</u>	<u>317,960</u>	<u>310,331</u>	<u>13,584</u>	<u>296,747</u>

The program was reduced in the last half of the year because of the fuel crisis.

As in the case of the C-5s, the C-141s' participation in the airlift did not cause the fiscal year program to be overflowed. However, in the second quarter the program was overflowed about 2,000 hours, and in October and November it was overflowed by 10,400 hours because of the airlift.

EFFECT OF THE AIRLIFT ON SCHEDULED  
CARGO ROUTES AND OTHER MISSIONS

In peacetime MAC operates scheduled cargo routes throughout the world. (See apps. II and III.) In addition to using its aircraft on these routes, MAC routinely procures airlift capability from commercial air carriers to satisfy the military services' requirements that exceed MAC's capability. Before each fiscal year, contracts are negotiated with U.S. carriers to cover a part of projected requirements. These contracts provide for expanding the capabilities bought to meet remaining user needs and contingency requirements, such as those evolving from the Israeli airlift.

The fiscal year 1974 fixed buys provided for about 100 commercial cargo flights during October and November at a cost of about \$4.4 million. Because of conversions, cancellations, and other changes, only 72 of these flights operated at a cost of \$2.8 million. Under the contracts, MAC also bought 114 commercial flights costing about \$5.1 million, to compensate for the 190 military flights withdrawn from channel routes during the Israeli airlift. Also, MAC purchased additional cargo capability on regular commercial airline routes at a cost of almost \$0.4 million. Total commercial augmentation for the 2 months cost about \$8.3 million, of which \$5.5 million worth was purchased because of the Israeli airlift. This amount is relatively small when compared with the monthly \$17.3 million worth purchased to support Southeast Asia commitments during the late 1960s.

The channel routes used most of MAC's capability during the airlift. However, MAC also supported other missions, some of which are shown in the following chart.

	<u>Area of operation</u>	<u>Aircraft flown</u>	
		<u>C-5</u>	<u>C-141</u>
JCS exercises:			
Reforger V	Europe and conti- nental United States	11	111
Brave Shield VI	Continental United States	4	171
Absalon Express	Europe	-	28
Special missions:			
United Nations peacekeeping forces	Finland, Ireland, and Egypt	-	7
Strategic Air Force redeployment	Southeast Asia and continental United States	9	53

MAC had additional airlift capacity during the Israeli airlift notwithstanding all the above requirements. This is demonstrated by the following examples.

--On some of the most active days of the airlift, MAC used five C-141s to transport the Air Force Academy choir from Colorado to California and to transport other cadets to the Air Force-Navy football game at Annapolis, Maryland.

--C-141s were used to transport the choir to St. Louis, Missouri, and other cadets were transported to the Air Force-Army football game at West Point, New York.

--From October 13 through November 14, 1973, an average of 7 C-5 and 46 C-141 operable aircraft were without assigned missions each day.

MAC also received support from the Air Force Tactical Air Command in operating its scheduled cargo routes. Using

its C-130 aircraft, the command made 35 flights, mainly to near U.S. offshore northern locations, and provided about 1.7 million ton-miles of capability. This capability was provided within the command's regular flying-hour program.

## CHAPTER 5

### COST OF AIRLIFT SERVICES

Equipment and supplies were airlifted to Israel under the Foreign Military Sales Act of 1968, as amended. According to the act, the United States is to recover the total cost of goods and services provided to foreign governments. But MAC and the Air Force billed Israel about \$45.1 million less than the cost of the service, which was about \$88.5 million.

Ton-mile costs for the C-5 and C-141 aircraft were 40 cents and 20 cents, respectively. At the same time, a commercial cargo-configured B-747 provided channel service at a ton-mile cost to MAC of only 11 cents. Although the performance of the B-747 aircraft may not be an applicable standard when applied to the Israeli airlift, it may be of value in determining future composition of the U.S. strategic airlift force.

### BILLINGS TO ISRAEL

The Foreign Military Sales Act of 1968 (22 U.S.C. 2761) authorizes the sale of defense articles and services to foreign countries and international organizations provided they agree to pay "not less than the value thereof in United States dollars."

In September 1973 we traced the evolution of section 21 of the Foreign Military Sales Act from its origin as section 408(e) of the Mutual Defense Assistance Act of 1949 (63 Stat. 714, 720). The 1949 act called for payment to the United States of the "full cost" of defense services provided. The language was later changed to the "fair value," "value," and finally "not less than the value" of such services. In our opinion, the language was intended to mean full cost reimbursement, and any question about what constitutes a cost should be resolved in favor of the United States.

Billings to Israel for airlift services provided under the Foreign Military Sales Act of 1968 were as follows:

<u>Type of aircraft</u>	<u>Hours charged</u>	<u>Hourly rates</u>	<u>Amounts billed</u>
C-141	13,477.2	\$1,356	\$18,275,083
C-5	4,961.8	4,836	<u>23,995,265</u>
Total			42,270,348
Additional charge to recover increased cost of fuel			<u>1,144,500</u>
			<u>\$43,414,848</u>

MAC, however, did not include all the flying hours and used outdated flying-hour costs in its billing data.

#### Incorrect hours billed

In examining MAC's operational and financial records, we found that 5.3 hours of C-5 time and 107 hours of C-141 time were excluded from the billings. Applying the rates charged, the amount underbilled was \$170,700. Because detailed records supporting the billings were not retained, we could not determine the precise cause of the under-billing. The situation likely resulted from inserting incorrect flight identifiers in the data processing system used to prepare the billings. After being apprised of the matter, MAC submitted an additional bill for the hours not charged.

#### Incorrect rates billed

The flying-hour rates used to bill foreign governments are supposed to be developed in accordance with DOD Directive 7410.4. This directive provides that foreign governments be charged at rates determined to secure reimbursement for total costs, including unfunded costs. "Unfunded costs" are defined as those not paid from industrial funds; examples are costs of military personnel services and depreciation on Government-owned equipment.

The flying-hour rates used to bill Israel are set forth in Air Force Regulation 76-28, dated September 1970, which is being revised. Recognizing that the rates in this regulation were outdated, an official of MAC's Airlift Service Industrial Fund asked Air Force headquarters for guidance on the rates to be charged. He was instructed to use the rates set forth in the September 1970 regulation. Therefore, the rates used understated MAC's costs.

The funded and unfunded costs recorded in the accounts of MAC's Airlift Service Industrial Fund for the C-5 aircraft exceed by \$4,016 an hour the rate set forth in the Air Force regulation and billed. Also, the recorded cost for the C-141 exceeds by about \$230 an hour that shown in the regulation and billed. Accordingly, if MAC's current recorded costs shown below had been used to compute the billings instead of the rates shown in the 4-year-old Air Force regulation, the billings would have been at least \$23 million more. The \$23 million represents mainly unfunded costs for military pay and aircraft depreciation.

Airlift Service Industrial Fund  
Flying-Hour Costs  
Quarter Ended December 31, 1973

<u>Cost</u>	<u>C-5</u>	<u>C-141</u>
Direct operating	\$3,241.93	\$ 675.45
Indirect system support	<u>283.51</u>	<u>104.19</u>
Total funded costs	<u>3,525.44</u>	<u>779.64</u>
Military pay	1,460.77	514.45
Aircraft depreciation	<u>3,866.01</u>	<u>291.44</u>
Total unfunded costs	<u>5,326.78</u>	<u>805.89</u>
Total costs	<u>\$8,852.22</u>	<u>\$1,585.53</u>

### Other costs not billed

The costs of other items, such as interest on the Government's investment, research and development, aircraft major modifications, and pay for military support personnel, were not included in MAC's billing to Israel. As stated in title 2, chapter 2, section 16.8(e), GAO Policy and Procedures Manual for Guidance of Federal Agencies:

"Interest is a cost generally applicable to all Federal Government expenditures. This concept is based on the fact that the Government's disbursements are made from a single pool of funds in the Federal Treasury which are not earmarked as to source or use. If funds disbursed for any given purpose had not been so disbursed, they could have been applied to repay or reduce borrowings, with a consequent savings in interest costs."

In view of the Government's large investment in military aircraft and facilities required to provide strategic airlift services, the interest cost is substantial. Since interest and other nonbilled costs are incident to airlift services, they should be included in charges to Israel and in future foreign military and other non-U.S. Government sales of goods and services.

These costs are not included in the table on page 25 because sufficient documentation was not available at MAC headquarters. We believe that the inclusion of these costs would increase the amount not billed to about \$45.1 million. (See app. XIV.)

### AGENCY ACTIONS

Both the Air Force and MAC recognized that the rates used were insufficient to recover the cost of the airlift service. On May 13, 1974, the Air Force advised MAC that the non-U.S. Government hourly rates for the C-5 and C-141 aircraft had been changed to \$12,500 and \$2,213, respectively. These rates included all the unfunded costs mentioned above. If these rates had been used to revise the

Israeli billing, the total cost would have been more than \$93 million. MAC was advised, however, that the new rates should be used only for interim requirements and planning purposes because they could change before Air Force Regulation 76-28 was revised. About 2 weeks later, the Air Force rescinded the above instructions and informed MAC that efforts to establish new rates for future billings were continuing.

During September 1974, at our request, the Air Force recomputed the billing rate and determined that Israel had been underbilled \$14,067,230. However, the Air Force still did not include about \$10 million worth of interest costs on the Government's investment. In addition, the Air Force computed and charged aircraft depreciation in a manner contrary to that of the Airlift Service Industrial Fund. (See app. XIII.)

In its final comments DOD defended charging depreciation on a daily basis for only those aircraft used in the airlift as meeting acceptable accounting practices and being consistent with those used by the transportation industry. DOD also stated it was still considering the applicability of billing Israel for interest on investment costs. (See app. XVI.)

We agree that the Air Force methodology for computing depreciation meets acceptable accounting practices and is consistent with those used by the transportation industry for accounting reporting purposes. However, this method is neither proper nor consistent with the practices used by the transportation industry for including depreciation in its billing rates for chartered aircraft.

It is industry practice to estimate its total operating cost, including depreciation of its aircraft and equipment, computed on a time basis. Then, to establish a rate that will recover all of these costs, it divides the costs by the estimated hours the aircraft will be leased for charters. MAC also does this to arrive at its funded and unfunded costs, which provides for recovery of all costs from the non-Government use of its strategic airlift fleet. The flaw in the way the Air Force has billed Israel for depreciation can be demonstrated by the fact that each aircraft in the fleet would have to be chartered every day to recover depreciation costs. Since this is impossible because part of a fleet is always in maintenance or is being used for other nonrevenue purposes, no airline could afford to bill depreciation on the basis which the Air Force has billed Israel.

Furthermore, MAC's depreciation rate used a 16- and 14-year life for the C-5 and C-141, respectively, which is more in line with industry practices than the 20-year life used by the Air Force. The Civil Aeronautics Board has specified a 16-year life for wide-bodied aircraft, such as the B-747 and L-1011, and a 14-year life for the B-707 and B-727.

We believe that the inclusion of the cost of interest on the Government's investment and the proper computation and allocation of depreciation charges would increase the Air Force's recomputed billing by about \$31 million. (See apps. XV and XVI.)

#### RELATIVE COST EFFECTIVENESS OF CARGO-CONFIGURED AIRCRAFT

The cost to move 1 ton of cargo 1 mile provides a basis for measuring the relative cost effectiveness of cargo-configured aircraft.

For the quarter ended December 31, 1973, the ton-mile costs for all MAC's C-5 and C-141 strategic airlift operations were 40 cents and 20 cents, respectively, based on MAC headquarters' cost data. Because these aircraft flew about 50 percent and 10 percent more special-assignment airlift missions, respectively, during the airlift, their ton-mile costs, particularly for the C-5, were actually lowered.

Although it appears from an economic standpoint that greater use of C-141s in the airlift would have been advantageous, other factors influenced the mix of aircraft. (See p. 9.)

According to MAC officials, the availability and cost of fuel were not considered in determining the type of aircraft used in the airlift. They pointed out, however, that during the period in question, C-5s used 30 percent less fuel for a ton-mile of cargo moved than did C-141s.

A commercial air carrier under contract with MAC used a cargo-configured B-747 aircraft to replace, in part, the military capability removed from channel routes in the Pacific area because of the Israeli airlift. It was the first of this type of aircraft used on MAC channel routes and was tested to determine its suitability and productivity. The aircraft flew 12 round trips between California

and the Philippines at a cost to MAC of about \$1.4 million, which included a 25-percent profit for the carrier.

On the segment of the route from California to Hawaii, the B-747 aircraft moved 1,045 tons of cargo at a cost to MAC of only 11 cents a ton-mile. The B-747 averaged a payload of 84 tons from Hawaii to Guam, a distance comparable to the critical leg of the Israeli airlift. This exceeded the average 73.2 tons moved by C-5s to Israel.

The use of the B-747 on the channel route was also a financial success. The revenue MAC earned exceeded the cost by about \$600,000. Therefore, it is evident that it is economically advantageous to use such commercial aircraft instead of military airlift when there is no requirement for military training and when the commercial aircraft can be used on high-density cargo channel routes.

In comparing the price for the B-747 service with costs of operating military aircraft, certain factors must be considered. The MAC aircraft were developed, designed, and produced to carry out various military missions, not to compete with the commercial airlift industry. The military missions required the installation of complex systems and subsystems that are not needed in commercial aircraft. Therefore, the acquisition costs and the recurring maintenance costs of military aircraft are much greater than those of commercial aircraft. Also, many systems and subsystems in the military aircraft are duplicative--backup systems--which increases maintenance costs.

Another factor causing MAC's aircraft to have higher operating costs was the difference in utilization rates. The authorized daily peacetime utilization rates for the C-5 and C-141 aircraft were 2.05 and 3.79 hours, respectively. These rates were much lower than those of commercial aircraft. Generally, long-range international cargo carriers use their aircraft an average of more than 10 hours a day. The B-747 used on MAC's channel routes flew an average of 14.5 hours a day. Although the performance of the B-747 aircraft may not be an applicable standard when applied to the Israeli airlift, it may be of value in determining the future composition of the strategic airlift force.

## CHAPTER 6

### LESSONS LEARNED

Although there were a number of problems during the airlift, none seriously impeded its successful completion. As unforeseen political and operational constraints and procedural deficiencies arose, adjustments were made to either accommodate or correct them. This was possible because the airlift was a relatively small, short-term operation, compared with MAC's overall capability. Nevertheless, as a result of the airlift, MAC learned a number of valuable lessons, including a need for

- in-flight aircraft-refueling capability,
- a logistics contingency plan for operations in the Middle East,
- improved management of airlift resources, and
- improved command-and-control elements and communications.

### NEED FOR IN-FLIGHT REFUELING CAPABILITY

Although a C-5 could have delivered about 33 tons of cargo nonstop from U.S. east coast bases to Israel, a C-141 could not have carried any cargo nonstop. Under these conditions, more than 670 C-5 flights would have been required to deliver the 22,497 tons of materiel to Israel. At the directed daily aircraft flow rate, it would have taken 100 days to deliver the materiel. Thus, with neither a strategically located land-base refueling facility nor an in-flight refueling capability, the Israeli airlift--from a practical standpoint--would have been impossible.

The use of Lajes Air Base made the airlift possible. Although Portugal made Lajes available for the Israeli airlift after considerable negotiation, it is uncertain whether it would do likewise in future emergencies. Therefore, an important lesson learned from the airlift is that, to implement the U.S. policy of remote presence, an

effective in-flight refueling capability is necessary for strategic airlift aircraft.

#### NEED FOR CONTINGENCY AIRLIFT PLAN

The United States needs a contingency airlift plan to support its commitments in the Middle East area. The plan should recognize that no air base can be counted on to be available in any contingency, unless it is on territory under U.S. control. It is normal for our allies' attitudes to change in the course of time, and we should expect this to happen. Therefore, our contingency planning must make a variety of assumptions, and air routes and overflight rights should be analyzed on the basis of each such assumption. MAC recognized this and will prepare such a plan when directed to do so.

#### NEED TO IMPROVE MANAGEMENT OF AIRLIFT RESOURCES

To manage an airlift efficiently, MAC should control the flow of aircraft. In the Israeli airlift, MAC responded to DOD directions and the aircraft flow rate changed frequently. To comply with the variable flow rate, MAC had to position reserve aircraft and crews at Lajes Air Base and use them as directed. This procedure proved to be counterproductive to efficient management of aircraft, crews, and facilities.

According to DOD, the Secretary of Defense controlled the airlift because of political considerations which were more important than efficient airlift management. However, DOD did agree that, to achieve economic use of aircraft, MAC should have the latitude to apply its capability considering total airlift needs. (See app. XV.)

When possible, MAC's requirements should be specific in terms of types of cargo to be moved, number of passengers to be moved, and time frames for movements. MAC must then be allowed to use the types of aircraft best suited to meet these requirements.

To efficiently use MAC's aircraft in large contingency operations, cargo to be airlifted should be moved by surface transportation or feeder aircraft to a relatively small

number of selected onloading points. This would relieve MAC from airlifting small loads over short distances, eliminate many time-consuming stops, and permit the consolidation of cargo and selection of optimum loads.

The contractual relations between MAC and commercial carriers proved to be, as in the past, a workable arrangement. When requested, carriers furnished airlift capability to replace that which was withdrawn from channel operations because of the Israeli airlift. MAC learned that, under certain conditions, the use of commercial wide-body cargo aircraft is efficient and productive.

The difficulties in maintaining and supporting C-5 aircraft during peacetime operations continued at about the same rate during the airlift. This reaffirmed the position of Air Force logisticians that, once the configurations of the airframe, systems, and subsystems are stabilized, action should be taken to adequately support the aircraft.

NEED TO IMPROVE COMMAND-AND-CONTROL  
PROCEDURES IN EMERGENCIES

Some of the lessons MAC learned pertaining to its command-and-control procedures were:

- The Command Support Staff established to manage emergency airlift operations was assigned an insufficient number of experienced people, and communications facilities available to the staff were inadequate.
- The MAC command post was not adequately manned to follow the flight of each mission, maintain flow charts, and update missions to higher levels. If established reports do not provide the necessary information, reporting procedures should be changed so that timely and accurate information can be provided to higher authorities.
- The manual method used by the staff to scan and display critical weather data was inefficient, uneconomical, and untimely. The data needs to be automated and displayed electronically.

- Communications were needlessly assigned security classifications, which caused problems in securing airlift requirements data and in providing information to higher headquarters.
  
- Precedence guidance on regulating communications either was disregarded or was not realistic, appropriate, or complete. This was evidenced by the saturation of the Scott AFB telecommunication center with an inordinate number of high-precedence messages, both incoming and outgoing.
  
- A requirement was identified for equipment that will provide reliable, high-quality-voice, air-to-ground, and secure communications. Such equipment should be deployed with the airlift support teams.

MAC is responding to the needs identified above.

## CHAPTER 7

### CONCLUSIONS AND RECOMMENDATIONS

MAC did an outstanding job of airlifting equipment and supplies to Israel even though advance planning was inadequate; certain European and African countries denied the United States vital landing, staging, and overflight rights; and MAC's authority to manage the airlift was limited.

Many of the problems MAC encountered during the airlift could have been prevented if DOD had developed a logistics contingency plan for support of U.S. interests in the Middle East prior to October 1973. General estimates of the type of support Israel would require in the event of another war could have been made despite Israel's refusal to provide detailed information regarding its armed forces. (See app. XV). Furthermore, the fact that Congress had not approved the procurement of stocks for such a purpose was all the more reason why a plan should have been developed.

DOD should have realized that, in the event of another Middle East war, logistical support of Israel would have to be made from existing U.S. inventories. As a result, DOD should have developed a plan based on estimates of the types and quantities of materiel Israel would need, where such materiel was located, and how it could be delivered. Then MAC could have planned an airlift flow pattern to determine which en route stations would have to be used and what overflight restrictions, if any, had to be considered. MAC also could have evaluated the en route stations and determined their support requirements in terms of men, equipment, and fuel.

The aerial delivery of combat tanks and other outsize cargo by C-5s was an impressive use of airlift capability, and it is impossible to assess the psychological impact of demonstrating this capability. In our opinion, the relatively small quantities of outsize equipment delivered in this manner had no decisive effect on the war's outcome. Except for the outsize cargo, the airlift could have been conducted without the C-5 aircraft. However, this would have disrupted other MAC airlift operations.

Most of MAC's C-5 aircraft were inoperable during the airlift. This situation did not prevent the accomplishment of any missions because the number of operable aircraft always exceeded those required. In our opinion, the operable C-5s did an excellent job of expeditiously delivering needed munitions and other materiel to Israel.

The C-5s have been plagued by maintenance problems and supply support since they entered MAC's inventory, and the cannibalization of aircraft for parts has been abnormally high. The operational readiness of the C-5s should increase as more systems are stabilized and as adequate spare parts are purchased to support these systems.

The airlift had only a minor effect on MAC's normal peacetime operations and by no means taxed its overall capability. Only a small percentage of MAC's strategic airlift capability was used to deliver materiel to Israel. During the first 33 days of a conventional war in Europe, MAC and the Civil Reserve Air Fleet would be capable of airlifting an awesome number of men and amount of materiel to West Germany. In comparison, the deliveries to Israel were very small. Therefore, the Israeli airlift cannot measure the U.S. capability to respond to an all-out war.

The cargo-configured B-747, used to augment MAC's channel routes in the Pacific, demonstrated the ability to carry large payloads over long distances at low costs. Aircraft of this type, if needed, would be a valuable asset to the U.S. strategic airlift force in the event of a general war in Europe or Asia.

MAC and the Air Force did not bill Israel for all U.S. costs for the airlift services. The exclusion of costs for military pay, depreciation, aircraft major modifications, and interest on investment resulted in underbilling Israel about \$45.1 million.

#### RECOMMENDATIONS

We recommend that the Secretary of Defense establish a contingency operation plan for the Middle East that would provide for overall logistic support, including strategic airlift to support U.S. interests in that area. MAC should

be allowed to manage the movement of cargo and personnel and to control the flow of aircraft in future strategic airlift operations, within the overall limits established by higher authorities.

We recommend also that the Secretary of the Air Force and the Commander of MAC should continue to bill the Government of Israel for all costs--funded and unfunded--of the airlift services provided, including a factor for depreciation on a basis consistent with the method established by the Airlift Service Industrial Fund and industry practices.

We further believe that the Secretary of the Air Force should:

- Improve the operational readiness of U.S. strategic airlift aircraft.
- Provide in-flight refueling capability for C-5 aircraft.
- Improve command-and-control operations for emergency situations.

## CHAPTER 8

### SCOPE OF REVIEW

We interviewed officials and examined documents, procedures, and practices relating to the 1973 airlift to Israel at the following locations.

#### Department of Defense:

Office of the Assistant Secretary of Defense,  
Installations and Logistics, Pentagon

Office of the Assistant Secretary of Defense,  
Comptroller, Pentagon

Office of the Assistant Secretary of Defense,  
Program Analysis and Evaluation, Pentagon

Office of the Assistant Secretary of Defense,  
International Security Affairs, Pentagon

Joint Chiefs of Staff, Pentagon

#### Department of the Air Force:

Assistant Secretary of the Air Force,  
Installations and Logistics, Pentagon

Deputy Chief of Staff, Systems and Logistics,  
Pentagon

Office of the Comptroller of the Air Force,  
Pentagon

MAC headquarters, Scott AFB, Illinois

Headquarters, 21st Air Force, McGuire AFB,  
New Jersey

Headquarters, 22d Air Force, Travis AFB,  
California

Headquarters, 436th Military Airlift Wing,  
Dover AFB, Delaware

Headquarters, Barksdale AFB, Louisiana

Ogden Air Logistics Center, Utah

Warner-Robins Air Logistics Center, Georgia

Department of the Army:

Pueblo Army Depot, Colorado

Red River Army Depot, Texas

Department of the Navy:

Alameda Air Terminal, Naval Air Station,  
California

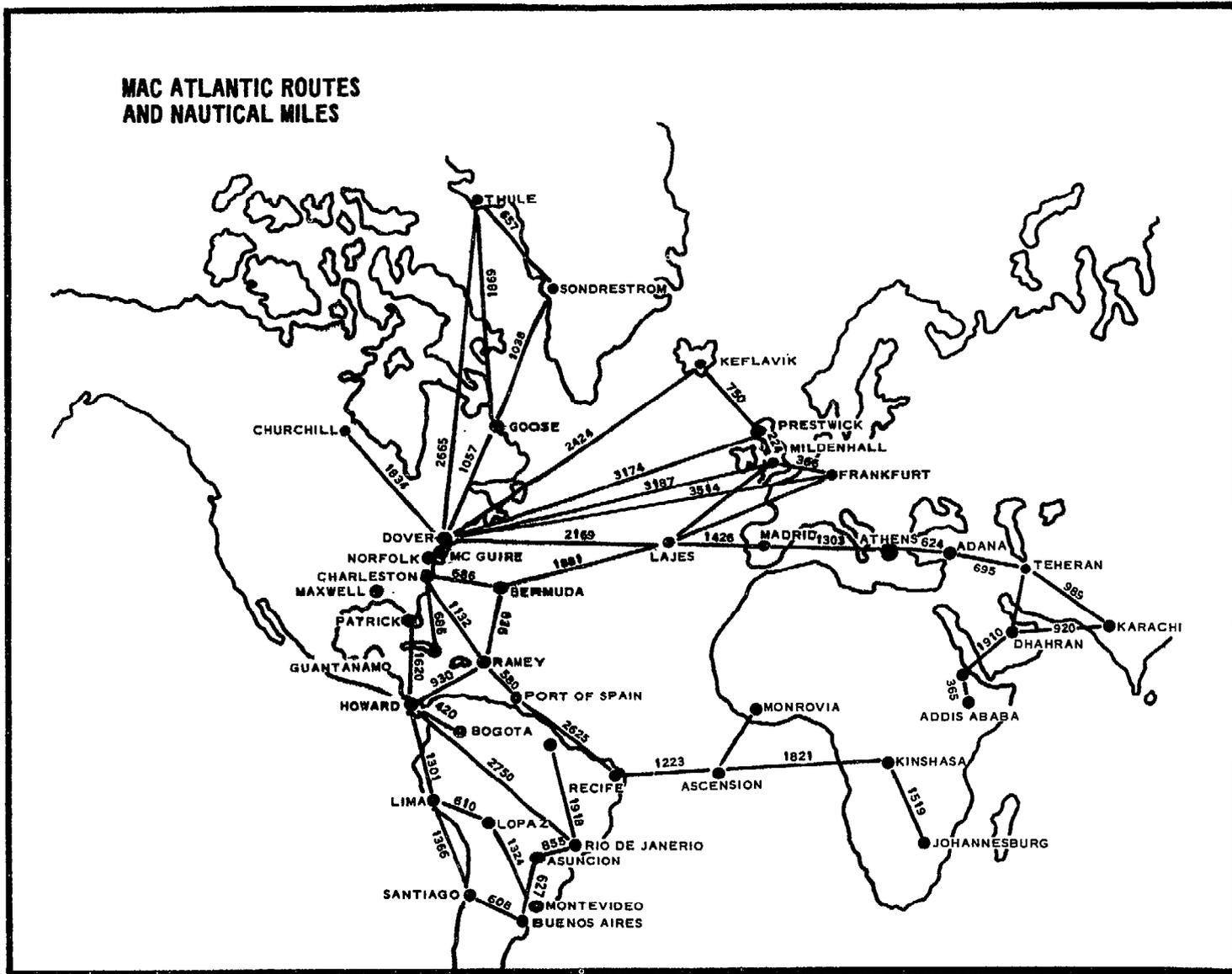
Headquarters, Naval Air Station, Corpus  
Christi, Texas

Norfolk Air Terminal, Naval Air Station,  
Virginia

MILITARY AIRLIFT COMMAND  
ASSIGNMENT OF C-5 AND C-141 AIRCRAFT  
OCTOBER AND NOVEMBER 1973

	<u>Number of C-5s assigned</u>	<u>Number of C-141s assigned</u>	<u>Total</u>
21st Air Force, McGuire AFB, New Jersey:			
436th wing, Dover AFB, Delaware	34	-	34
437th wing, Charles- ton AFB, South Caro- lina	2	60	62
438th wing, McGuire AFB, New Jersey	<u>-</u>	<u>59</u>	<u>59</u>
	<u>36</u>	<u>119</u>	<u>155</u>
22d Air Force, Travis AFB, California:			
60th wing, Travis AFB, California	36	40	76
62d wing, McChord AFB, Washington	-	40	40
63d wing, Norton AFB, California	-	59	59
443d wing, Altus AFB, Oklahoma	<u>5</u>	<u>18</u>	<u>23</u>
	<u>41</u>	<u>157</u>	<u>198</u>
Total	<u><sup>a</sup>77</u>	<u>276</u>	<u>353</u>

<sup>a</sup>The two other C-5s in the U.S. fleet were assigned to the Air Force Systems Command.

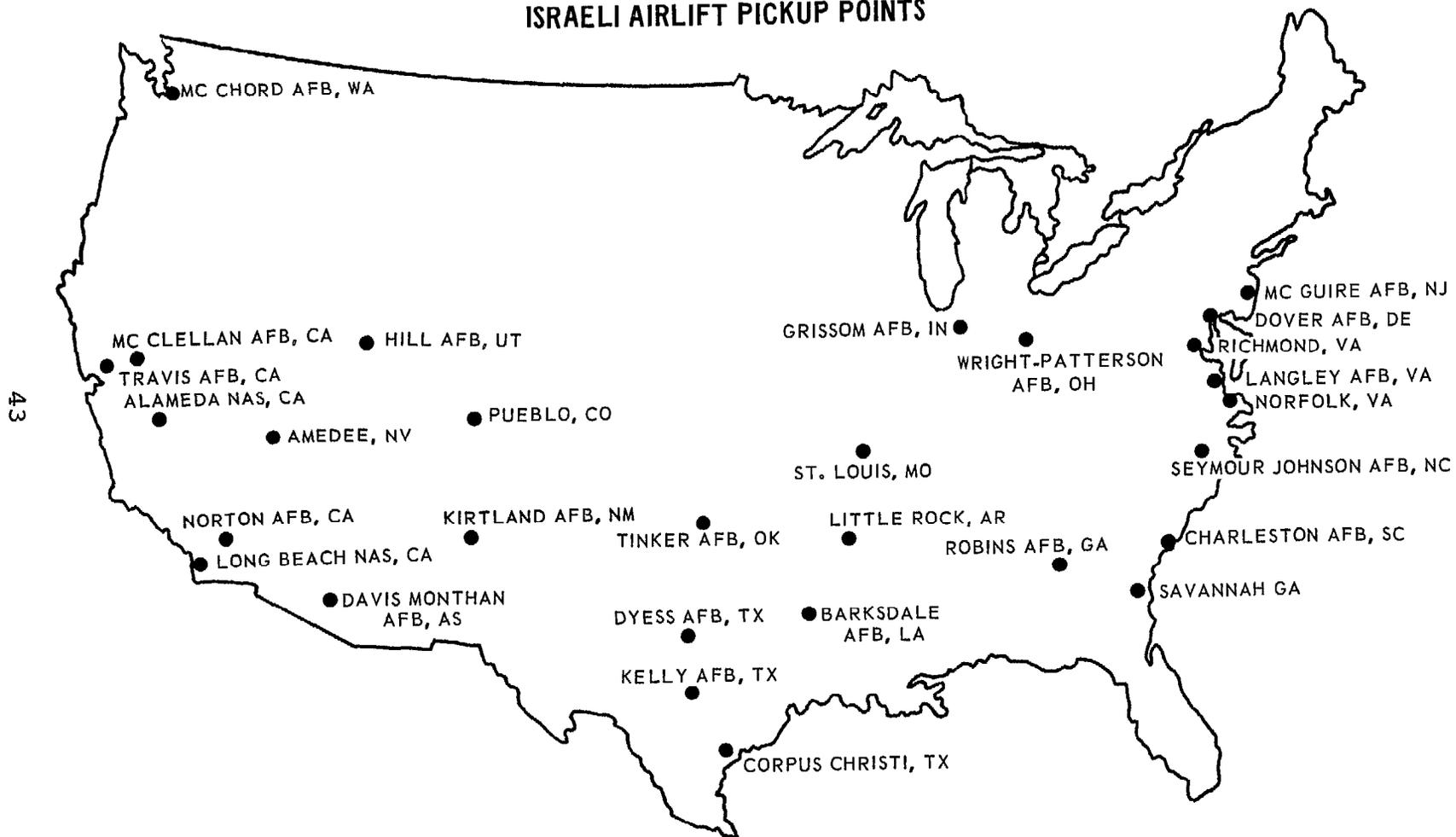




AIRCRAFT PERFORMANCE AND CHARACTERISTICS

Normal weight data (pounds):	<u>C-141</u>	<u>C-5</u>
Takeoff gross weight	323,100	712,500
Operating weight	140,309	343,565
Normal passenger seats available	100	73
Maximum allowable cabin load (cargo)	64,311	154,435
Dimensions (feet):		
Length	145.0	247.9
Height	39.3	65.1
Wingspan	160.0	222.7
Range (nautical miles):		
Maximum range with maximum allowable cabin load	3,306	2,948
Speed (knots):		
Average cruise airspeed	425	450
Tactical capability:		
Maximum passengers:		
Ground troops	152	73
Paratroops	122	73
Maximum cargo (pounds)	64,311	215,339

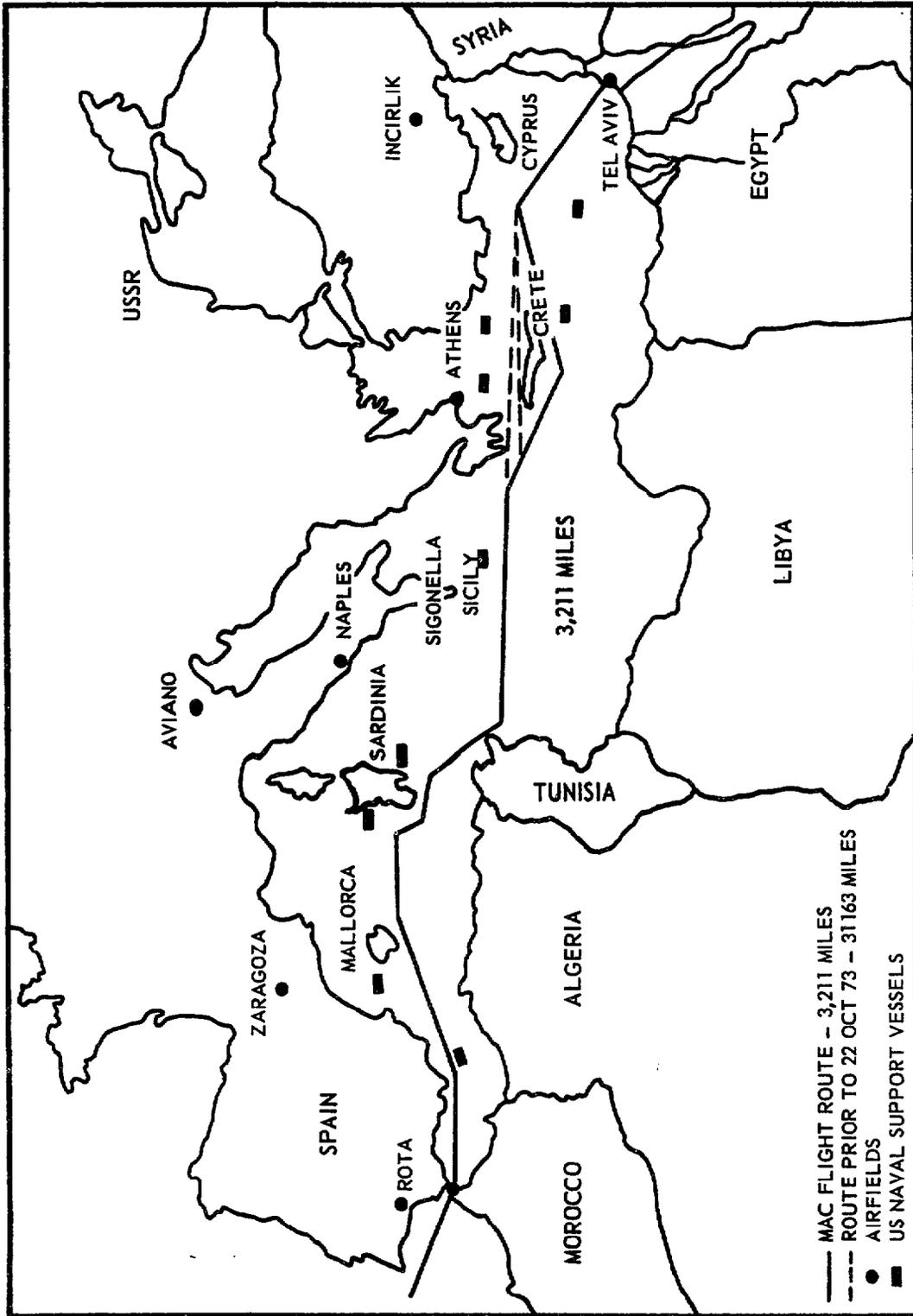
# ISRAELI AIRLIFT PICKUP POINTS



APPENDIX V

APPENDIX V

MAC AIRLIFT ROUTE



TONS OF EQUIPMENT AND SUPPLIES LOADED  
ON C-5s BY ONLOADING POINTS

	<u>Onloading points</u>	<u>Description of materiel</u>	<u>Tonnage onloaded</u>	
			<u>Equipment and supplies</u>	<u>Mission-support equipment</u>
United States:				
	Alameda Naval Air Station	A4 aircraft tail/fuselage sections and unidentifiable supplies	66.00	-
	Barksdale AFB	XM48 Chapparel missile carriers, XM163 Vulcan 20mm cannon carrier and ammunition, M109 self-propelled 155mm howitzers and ammunition, and communications vans	639.45	11.98
	Charleston AFB	Fuel truck and aircraft cargo-loading equipment	-	34.27
	Corpus Christi Naval Air Station	A4 aircraft tail/fuselage sections and unidentifiable supplies	16.88	-
	Davis Monthan AFB	Maverick missiles and C-97 aircraft engines	95.41	-
	Dover AFB	Maverick, Shrike, Walleye and Hawk missiles; M107 self-propelled 175mm guns and ammunition; C-5 engines; engine servicing platform; and self-propelled aircraft towing vehicle	1,587.64	68.03
	Grissom AFB	Rockeye bombs	153.50	-
	Hill AFB	Fuel tanks, tents, aircraft wheels, clothing, and support for Maverick missiles	575.42	40.82

TONS OF EQUIPMENT AND SUPPLIES LOADED  
ON C-5s BY ONLOADING POINTS

<u>Onloading points</u>	<u>Description of materiel</u>	<u>Tonnage onloaded</u>	
		<u>Equipment and supplies</u>	<u>Mission-support equipment</u>
United States:			
Little Rock AFB	Bombs, 105mm ammunition, and aircraft cargo-loading equipment	1,590.49	23.50
Long Beach Naval Air Station	A4 aircraft tail/fuselage section	6.05	-
McClellan AFB	Fuses, 2.75mm rockets, chaff, and bomb pins	233.20	-
McGuire AFB	Fuel trucks	-	21.14
Norfolk Naval Air Station	CH-53 helicopters and wheel power supply vans	110.46	-
Norton AFB	Fuel trucks	-	31.70
Pueblo Airport	Hawk battery radar and illuminators	154.50	-
Robins AFB	M-60 main battle tanks, M-48 battle tanks, chaff, bombs, racks, missiles, 155mm fuses and ammunition, and aircraft cargo-loading equipment	3,460.27	23.50
St. Louis Airport	F-4 aircraft wing	6.75	-
Tinker AFB	Power and transformer vans	-	46.00
Travis AFB	Aircraft cargo-loading equipment and unidentifiable supplies	37.96	23.50

## APPENDIX VII

## APPENDIX VII

	<u>Onloading points</u>	<u>Description of materiel</u>	<u>Tonnage onloaded</u>	
			<u>Equipment and supplies</u>	<u>Mission-support equipment</u>
United States:				
	Wright-Patterson AFB	155mm and 175mm ammunition and 2.79 mm rockets	2,321.45	-
Germany:				
	Ramstein Air Base	175mm gun tubes	<u>51.65</u>	<u>-</u>
	Totals		<u>11,107.08</u>	<u>324.44</u>
	Combined			11,431.52
	Onloaded at Lajes Air Base (transshipments)			<u>486.77</u>
	Total tonnage			<u>11,918.29</u>

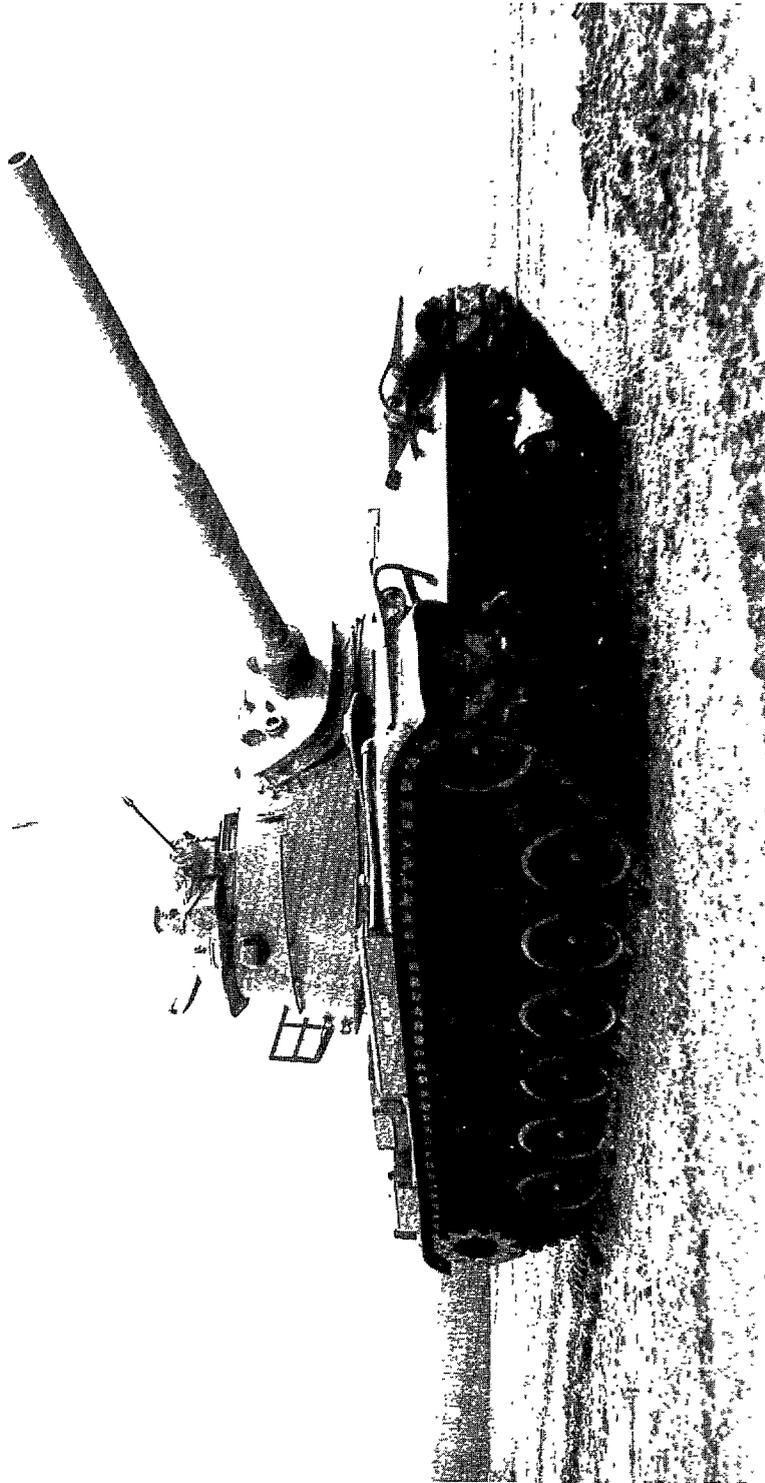
OUTSIZE EQUIPMENT AIRLIFTED BEFORE AND AFTER  
THE MIDDLE EAST CEASE-FIRE AGREEMENT ON OCTOBER 24, 1973

THE INFORMATION CONTAINED IN THIS APPENDIX IS  
CLASSIFIED (SECRET). IT WILL BE MADE AVAILABLE  
TO APPROPRIATELY CLEARED OFFICIALS UPON REQUEST.

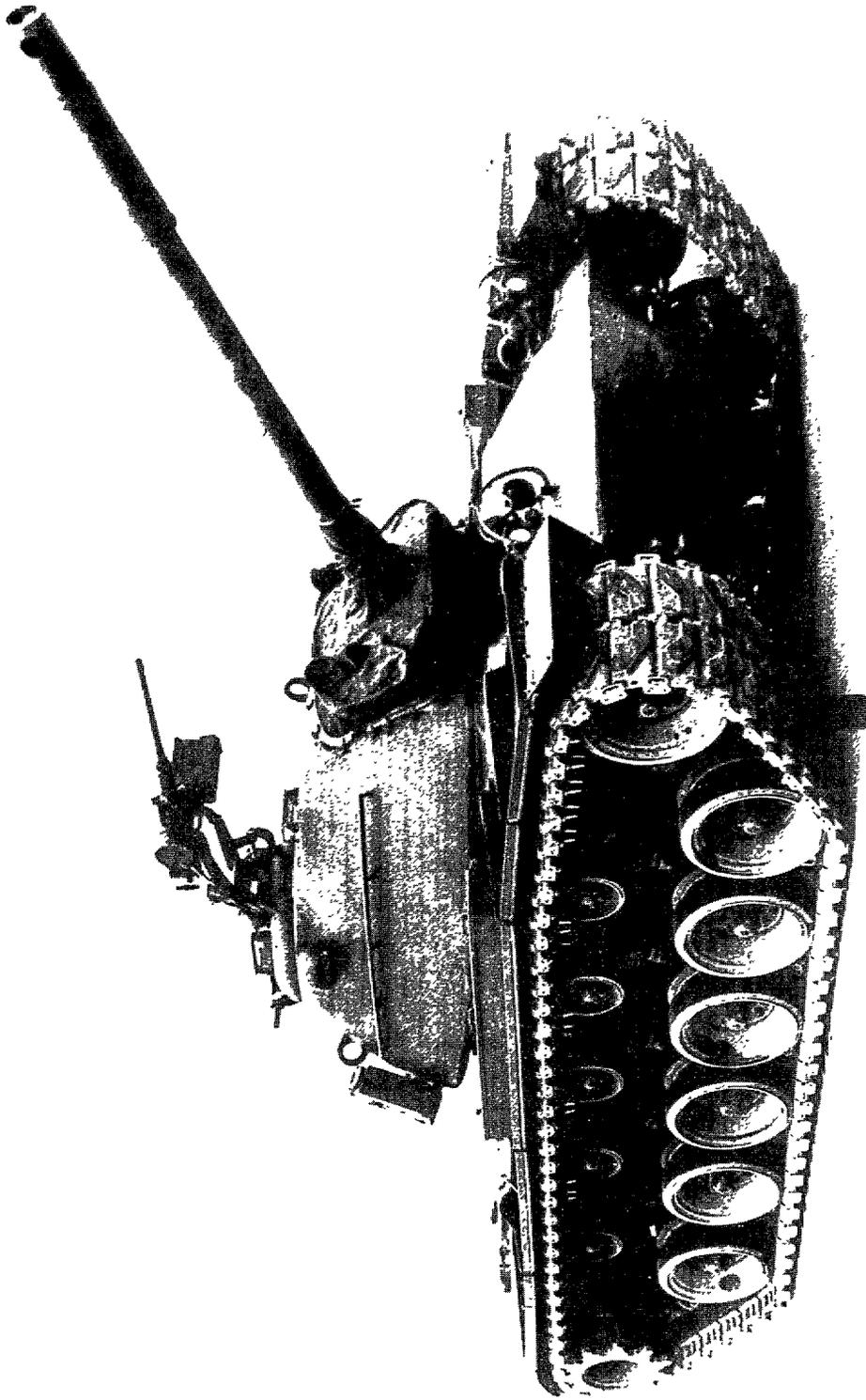
OUTSIZE EQUIPMENT AIRLIFTED AND SEALIFTED TO ISRAEL  
AS OF NOVEMBER 2, 1973

THE INFORMATION CONTAINED IN THIS APPENDIX IS  
CLASSIFIED (SECRET). IT WILL BE MADE AVAILABLE  
TO APPROPRIATELY CLEARED OFFICIALS UPON REQUEST.

PHOTOGRAPHS AND CHARACTERISTICS  
OF MOST OUTSIZE EQUIPMENT  
AIRLIFTED

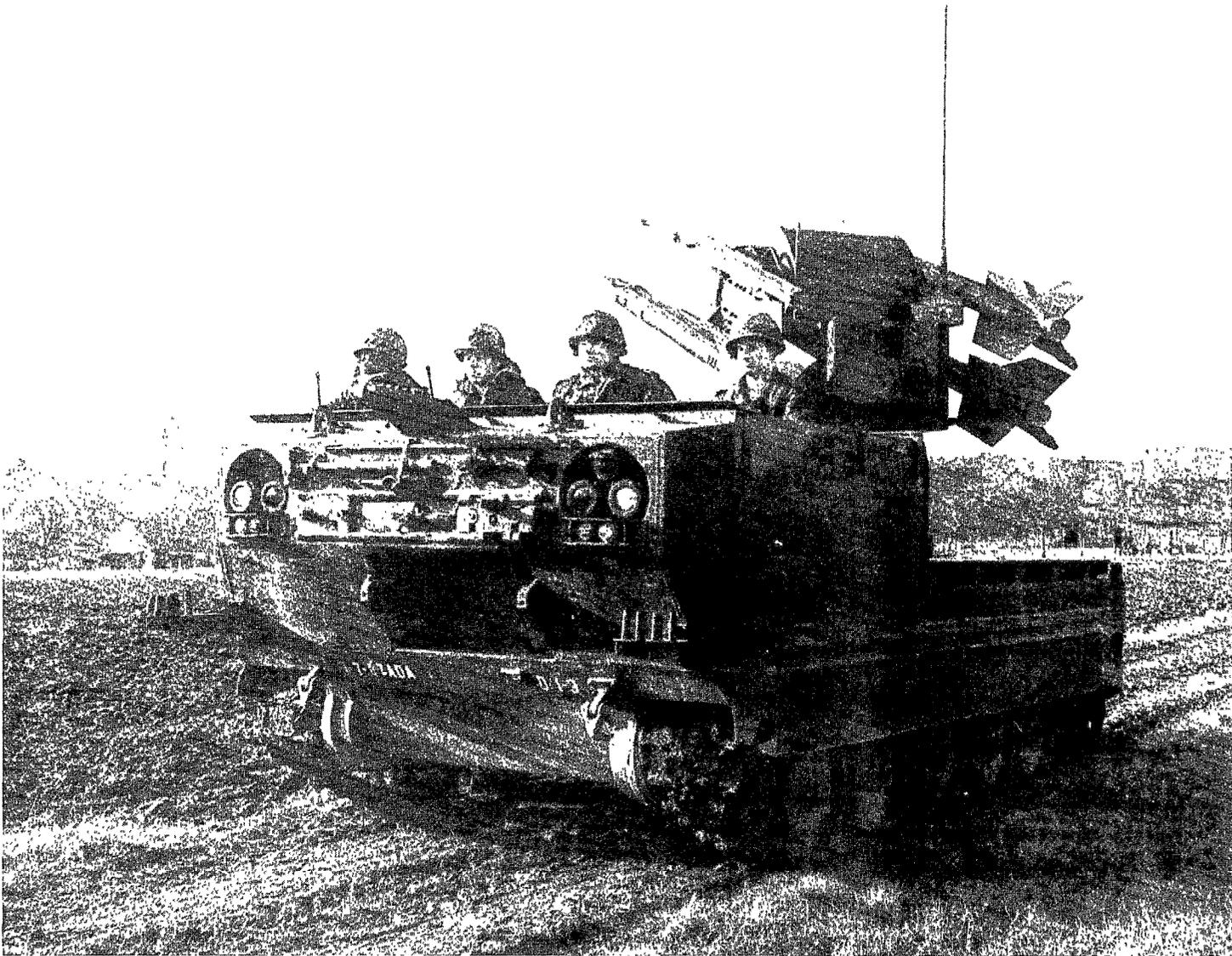


	<u>Weight</u>	<u>Height</u>	<u>Length</u>	<u>Width</u>
M-60 Main Battle Tank	97,494 Lbs.	128"	325"	144"



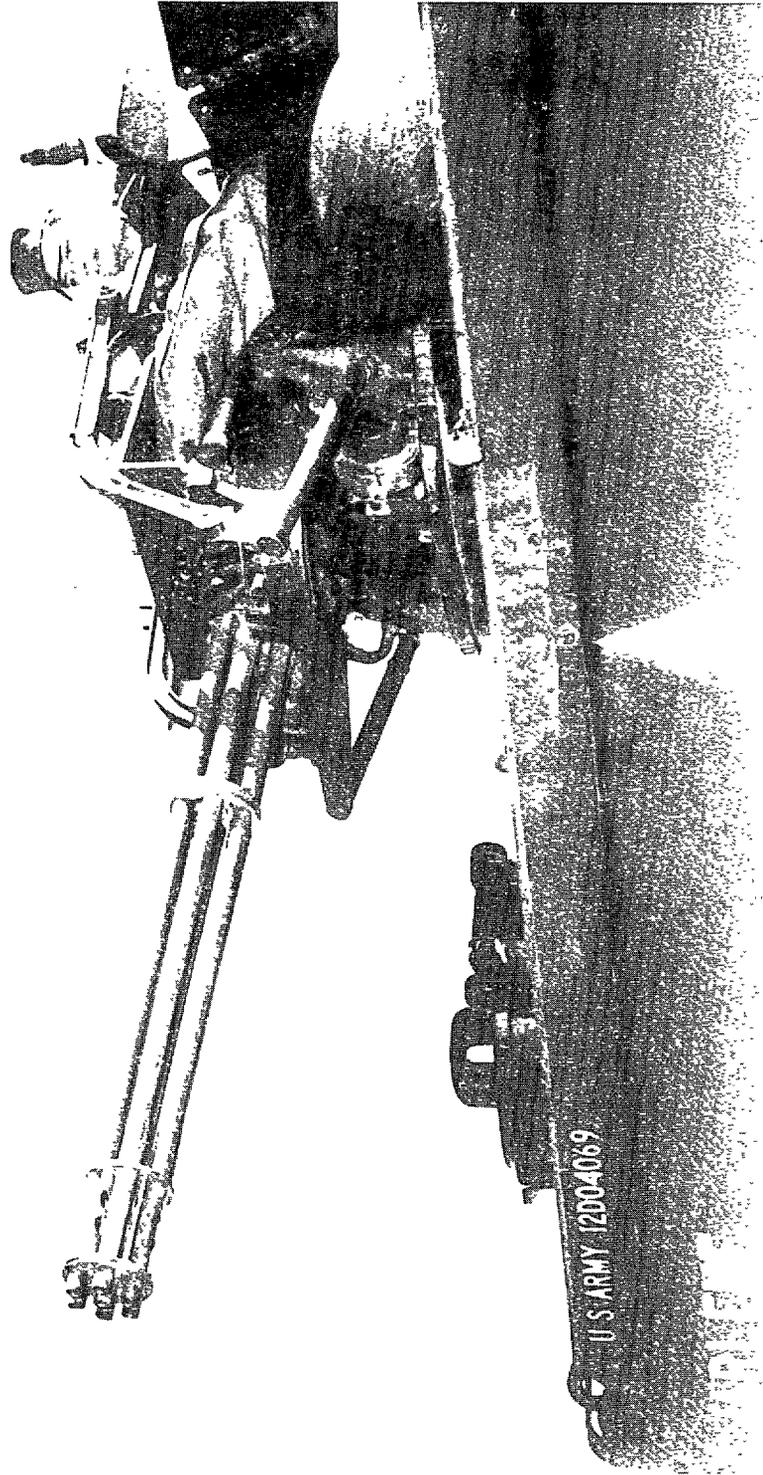
M-48 Main Battle Tank

<u>Weight</u>	<u>Height</u>	<u>Length</u>	<u>Width</u>
97,000 Lbs.	122"	292"	143"



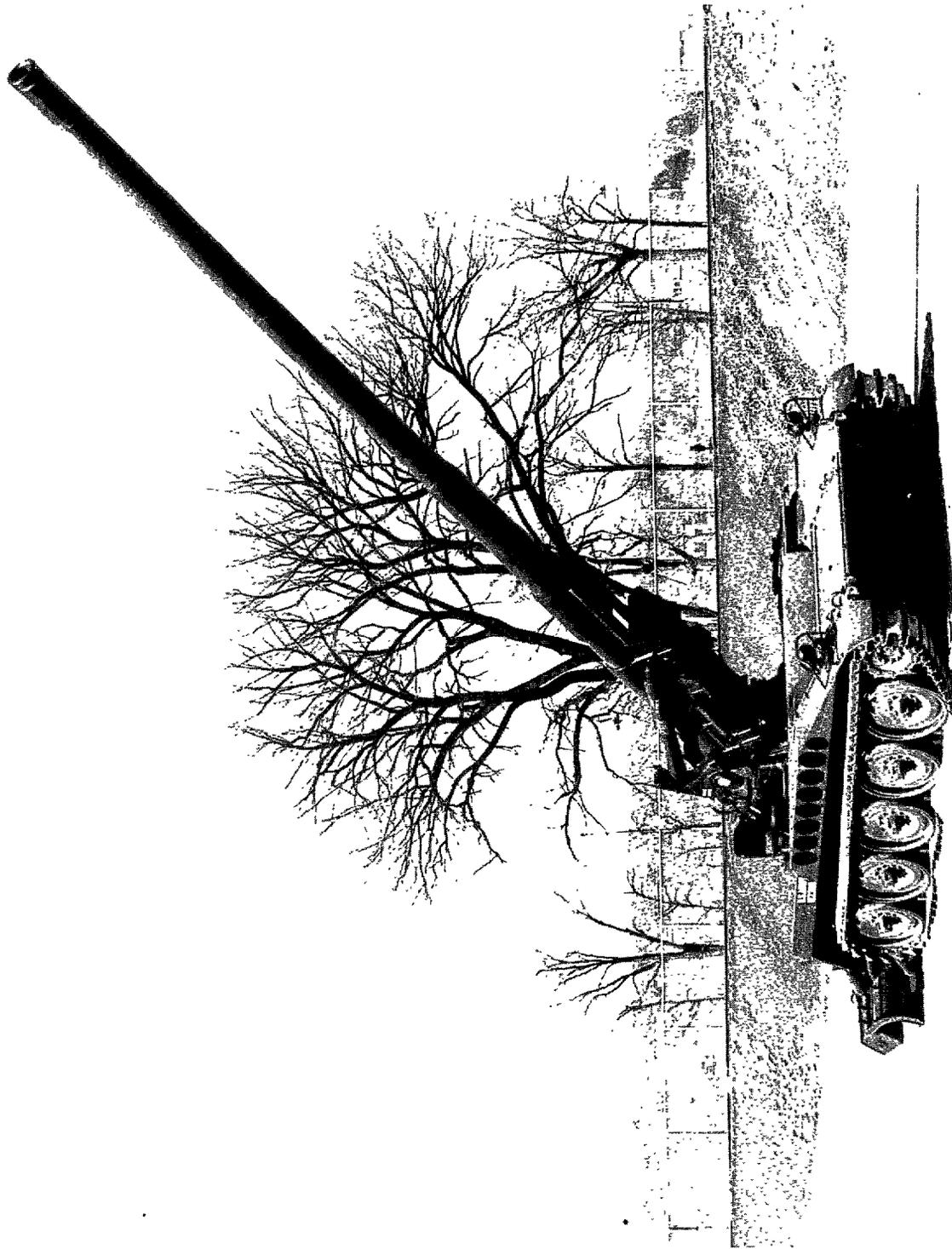
XM-48 Chapparel Missile Carrier

<u>Weight</u>	<u>Height</u>	<u>Length</u>	<u>Width</u>
24,000 Lbs.	107"	240"	106"



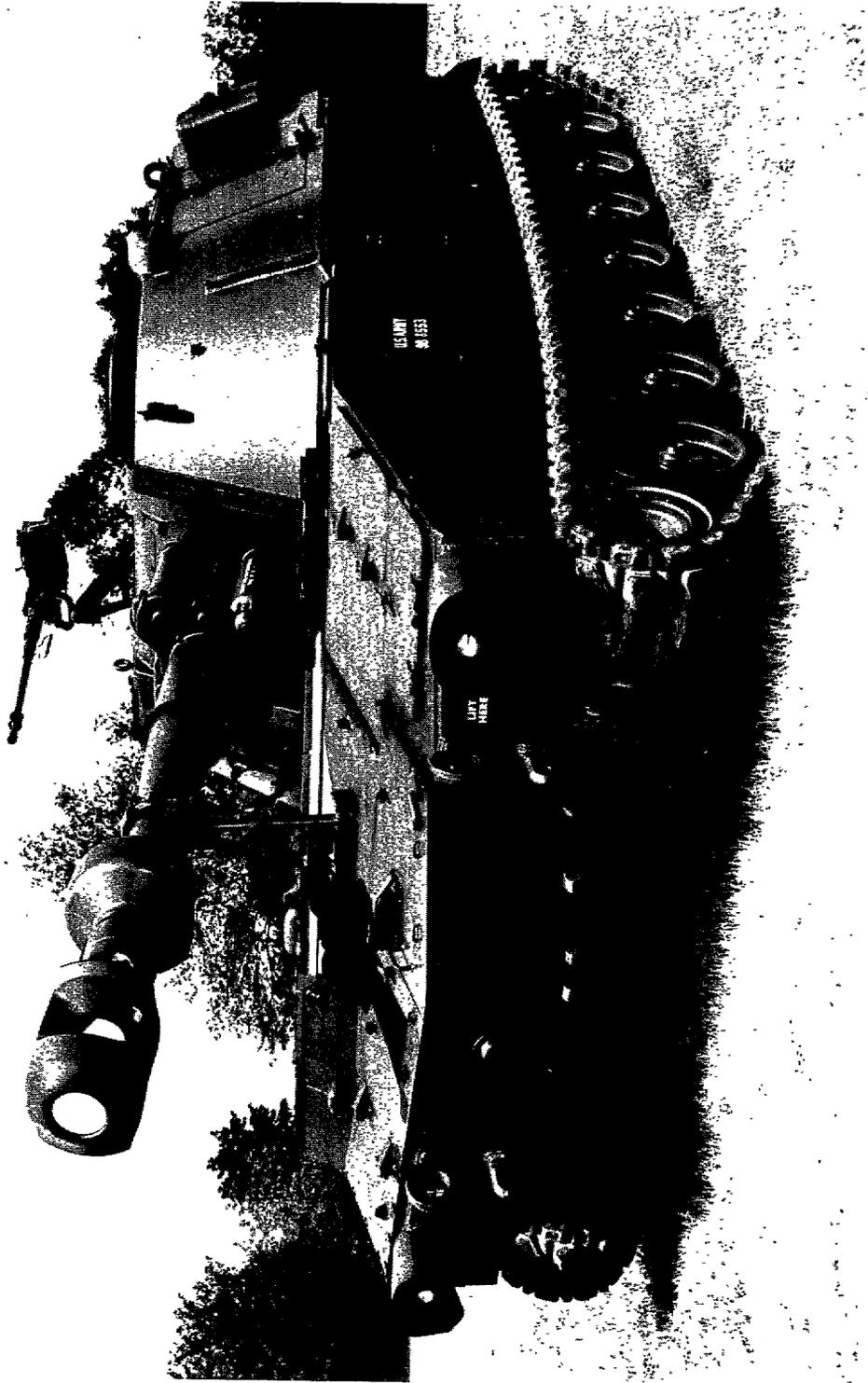
XM-163 Vulcan 20mm Cannon Carrier

<u>Weight</u>	<u>Height</u>	<u>Length</u>	<u>Width</u>
24,370 Lbs.	106"	191 1/2"	106"



M-107 Self-Propelled 175mm Gun

<u>Weight</u>	<u>Height</u>	<u>Length</u>	<u>Width</u>
55,800 Lbs.	137"	445"	124"



M-109 Self-Propelled 155mm Howitzer

<u>Weight</u>	<u>Height</u>	<u>Length</u>	<u>Width</u>
52,461 Lbs.	120"	261"	124"



<u>Weight</u>	<u>Height</u>	<u>Length</u>	<u>Width</u>
14,419 Lbs.	160"	678"	186"

C-5 OPERATIONAL STATUS DURING ISRAELI AIRLIFT  
OCTOBER 13 THROUGH NOVEMBER 14, 1973

1973 (note a)	Aircraft assigned	Operational aircraft								Inoperable aircraft grounded due to					Inoperable aircraft due in commission (note b)
		Aircraft on missions				Aircraft without missions				Depot maintenance	Unit maintenance	Lack of parts	Total		
		To Israel	Other	Total	Percent	Total	Percent	Total	Percent				Total	Percent	
Oct. 13	77	7	17	24	31.2	8	10.3	32	41.6	15	20	10	45	58.4	7
14	77	7	15	22	28.6	9	11.7	31	40.3	15	18	13	46	59.7	7
15	77	11	12	23	29.9	12	15.6	35	45.5	16	11	15	42	54.5	14
16	77	17	8	25	32.5	5	6.5	30	39.0	17	18	12	47	61.0	8
17	77	17	5	22	28.6	12	15.6	34	44.2	17	15	11	43	55.8	10
18	77	17	6	23	29.9	9	11.7	32	41.6	18	16	11	45	58.4	14
19	77	18	7	25	32.5	2	2.6	27	35.1	18	24	8	50	64.9	13
20	77	17	5	22	28.6	8	10.3	30	39.0	18	18	11	47	61.0	4
21	77	21	6	27	35.1	8	10.4	35	45.5	17	14	11	42	54.5	8
22	77	18	5	23	29.9	10	13.0	33	42.9	17	16	11	44	57.1	7
23	77	17	7	24	31.2	10	13.0	34	44.2	18	16	9	43	55.8	6
24	77	17	10	27	35.1	2	2.6	29	37.7	18	19	11	48	62.3	10
25	77	15	10	25	32.5	9	11.7	34	44.2	18	18	7	43	55.8	11
26	77	14	9	23	29.9	8	10.4	31	40.3	18	20	8	46	59.7	9
27	77	18	14	32	41.6	4	5.2	36	46.8	18	15	8	41	53.2	8
28	77	15	11	26	33.8	6	7.8	32	41.6	18	19	8	45	58.4	7
29	77	13	11	24	31.2	10	13.0	34	44.2	18	16	9	43	55.8	5
30	77	12	12	24	31.2	7	9.1	31	40.3	18	19	9	46	59.7	8
31	77	15	8	23	29.9	9	11.7	32	41.6	18	19	8	45	58.4	10
Nov. 1	77	14	10	24	31.2	8	10.4	32	41.6	18	17	10	45	58.4	6
2	77	16	11	27	35.1	3	3.9	30	39.0	18	19	10	47	61.0	8
3	77	18	7	25	32.5	3	3.9	28	36.4	18	20	11	49	63.6	6
4	77	15	8	23	29.9	2	2.6	25	32.5	17	24	11	52	67.5	9
5	77	9	6	15	19.5	10	13.0	25	32.5	17	24	11	52	67.5	6
6	77	11	8	19	24.7	5	6.5	24	31.2	17	26	10	53	68.8	8
7	77	16	8	24	31.2	2	2.6	26	33.8	16	23	12	51	66.2	10
8	77	12	11	23	29.9	6	7.8	29	37.7	16	22	10	48	62.3	9
9	77	11	9	20	26.0	7	9.1	27	35.1	16	24	10	50	64.9	8
10	77	11	12	23	29.9	8	10.3	31	40.3	16	19	11	46	59.7	4
11	77	8	8	16	20.8	12	15.6	28	36.4	16	23	10	49	63.6	9
12	77	7	11	18	23.4	10	13.0	28	36.4	18	23	8	49	63.6	10
13	77	6	16	22	28.6	6	7.8	28	36.4	17	24	8	49	63.6	10
14	77	4	12	16	20.8	8	10.3	24	31.2	18	26	9	53	68.8	10
Total	<u>2,541</u>	<u>444</u>	<u>315</u>	<u>759</u>		<u>238</u>		<u>997</u>		<u>568</u>	<u>645</u>	<u>331</u>	<u>1,544</u>		<u>279</u>
33 day average	77.0	13.5	9.5	23.0		7.2		30.2		17.2	19.6	10.0	46.8		8.5
Percent	100	17.5	12.4	29.9		9.4		39.2		22.3	25.4	13.0	60.8		

a At midnight Greenwich mean time.

b Number of aircraft estimated due in commission within 12 hours of reporting time.

**C-141 OPERATIONAL STATUS DURING ISRAELI AIRLIFT**  
**OCTOBER 13 THROUGH NOVEMBER 14, 1973**

1973 (note a)	Aircraft assigned	Operational aircraft								Inoperable aircraft grounded due to					Inoperable aircraft due in commission (note b)	
		Aircraft on missions				Aircraft without missions				Total	Percent	Total	Percent	Total		Percent
		To Israel	Other	Total	Percent	Total	Percent	Depot maintenance	Unit maintenance							
Oct. 13	276	27	91	118	42.8	64	23.2	182	65.9	25	65	4	94	34.1	42	
14	276	40	87	127	46.0	69	25.0	196	71.0	20	47	13	80	29.0	24	
15	276	53	93	146	52.9	45	16.3	191	69.2	20	47	18	85	30.8	18	
16	276	49	103	152	55.1	42	15.2	194	70.3	26	49	7	82	29.7	25	
17	276	40	115	155	56.2	33	12.0	188	68.1	26	56	6	88	31.9	36	
18	276	36	115	151	54.7	35	12.7	186	67.4	24	60	6	90	32.6	30	
19	276	39	108	147	53.3	29	10.5	176	63.8	22	72	6	100	36.2	43	
20	276	41	113	154	55.8	38	13.8	192	69.6	22	54	8	84	30.4	35	
21	276	40	121	161	58.3	49	17.8	210	76.1	23	32	11	66	23.9	17	
22	276	36	108	144	52.2	51	18.5	195	70.7	22	48	11	81	29.3	25	
23	276	41	113	154	55.8	36	13.0	190	68.8	23	53	10	86	31.2	26	
24	276	33	118	151	54.7	35	12.7	186	67.4	27	55	8	90	32.6	33	
25	276	28	97	125	45.3	55	19.9	180	65.2	23	66	7	96	34.8	27	
26	276	34	90	124	44.9	55	19.9	179	64.9	17	73	7	97	35.1	47	
27	276	39	91	130	47.1	53	19.2	183	66.3	16	69	8	93	33.7	37	
28	276	33	100	133	48.2	54	19.6	187	67.8	16	64	9	89	32.2	30	
29	276	37	93	130	47.1	55	19.9	185	67.0	17	66	8	91	33.0	27	
30	276	23	114	137	49.6	42	15.2	179	64.9	19	71	7	97	35.1	39	
31	276	21	125	146	52.9	42	15.2	188	68.1	20	61	7	88	31.9	34	
Nov. 1	276	24	120	144	52.2	37	13.4	181	65.6	22	66	7	95	34.4	25	
2	276	21	117	138	50.0	35	12.7	173	62.7	21	73	9	103	37.3	29	
3	276	17	112	129	46.7	41	14.9	170	61.6	19	77	10	106	38.4	43	
4	276	22	105	127	46.0	46	16.7	173	62.7	19	72	12	103	37.3	37	
5	276	25	105	130	47.1	45	16.3	175	63.4	21	71	9	101	36.6	32	
6	276	25	96	121	43.8	46	16.7	167	60.5	23	76	10	109	39.5	37	
7	276	27	99	126	45.7	40	14.5	166	60.1	27	72	11	110	39.9	36	
8	276	21	93	114	41.3	38	13.8	152	55.1	25	88	11	124	44.9	34	
9	276	28	78	106	38.4	43	15.6	149	54.0	23	93	11	127	46.0	58	
10	276	26	81	107	38.8	37	20.7	164	59.4	23	74	15	112	40.6	35	
11	276	24	81	105	38.0	63	22.8	168	60.9	24	66	18	108	39.1	29	
12	276	20	99	119	43.1	51	18.5	170	61.6	24	64	18	106	38.4	31	
13	276	10	111	121	43.8	39	14.1	160	58.0	26	76	14	116	42.0	35	
14	276	8	106	114	41.3	46	16.7	160	58.0	28	75	13	116	42.0	39	
Total	<u>9,108</u>	<u>988</u>	<u>3,398</u>	<u>4,386</u>		<u>1,509</u>		<u>5,895</u>		<u>733</u>	<u>2,151</u>	<u>329</u>	<u>3,213</u>		<u>1,095</u>	
33 day average	276	29.9	103	132.9		45.7		178.6		22.2	65.2	10.0	97.4		33.2	
Percent	100	10.8	37.3	48.1		16.6		64.7		8.0	23.7	3.6	35.3			

<sup>a</sup> At midnight Greenwich mean time.

<sup>b</sup> Number of aircraft estimated due in commission within 12 hours of reporting time.

BEST DOCUMENT AVAILABLE

AIR FORCE-REVISED BILLING RATE  
FOR CHARGING ISRAEL FOR AIRLIFT SUPPORT  
DURING THE QUARTER ENDED DECEMBER 31, 1973

	<u>C-5</u>	<u>C-141</u>	<u>Total</u>
Direct operating costs	\$ 3,241.93	\$ 675.45	\$ 3,917.38
Indirect-systems support	283.51	104.19	387.70
Mission-support equipment depreciation	34.00	11.00	45.00
Military pay (includes amount for support personnel)	<u>2,337.23</u>	<u>823.12</u>	<u>3,160.35</u>
Total	<u>5,896.67</u>	<u>1,613.76</u>	<u>7,510.43</u>
X flying hours of 4,967.1 and 13,584.2, respectively	\$29,289,349.56	\$21,921,638.59	\$51,210,988.15
Aircraft depreciation per day: (20-year life; 15% residual) (note a)			
Unit cost	41,384,000.00	6,320,000.00	47,704,000.00
Research and develop- ment	13,495,000.00	-	13,495,000.00
Major aircraft modifica- tion	<u>354,437.00</u>	<u>683,600.00</u>	<u>1,038,037.00</u>
Total	<u>55,233,437.00</u>	<u>7,003,600.00</u>	<u>62,237,037.00</u>
Daily rate	6,431.00	815.00	
X Number of days of 620 and 1,398, re- spectively	<u>3,987,220.00</u>	<u>1,139,370.00</u>	<u>5,126,590.00</u>
Total	<u>33,276,569.56</u>	<u>23,061,008.59</u>	<u>56,337,578.15</u>
Additional charge to recover increased fuel cost			<u>1,144,500.00</u> <u>57,482,078.15</u>
Amount billed			<u>43,414,848.00</u>
Balance			<u>\$14,067,230.15</u>

<sup>a</sup>The Airlift Service Industrial Fund computes depreciation for the C-5 and C-141 aircraft using a 16- and 14-year life, respectively, with a 15% residual value per aircraft and charges the depreciation on a flying-hour basis rather than by day.

BEST DOCUMENT AVAILABLE

COSTS NOT INCLUDED IN MAC BILLING  
FOR AIRLIFT SERVICE AS COMPUTED BY GAO

Airlift Service Industrial Fund  
unfunded costs not billed \$20,550,131 (note a)

Interest on investment:

C-5 \$13,203 x 620 = \$8,185,860 (note b)  
C-141 \$ 1,266 x 1,398 = \$1,769,868 (note b)

Research and development:

C-5	\$13,495,000	Research and development cost
	<u>-2,024,250</u>	Residual value (15%)
	11,470,750	
	x 72	Number of aircraft
	<u>825,894,000</u>	
	÷ 16	Airlift fund life of aircraft in years
	51,618,375	
	+ 4	Quarters in year
	<u>12,904,593.75</u>	
	÷ 12,435	Hours flown in quarter
	1,037.76	Airlift fund flying-hour research and development cost
	x 4,967.1	Hours flown in airlift
	<u>\$ 5,154,657.70</u>	Cost applicable to airlift

C-141 Information not available

Major aircraft modifications:

C-5	\$ 354,437	Modifications cost
	<u>- 53,166</u>	Residual value (15%)
	301,271	
	x 72	Number of aircraft
	<u>21,691,512</u>	
	+ 16	Airlift fund life of aircraft in years
	1,355,719.50	
	+ 4	Quarters in year
	<u>338,929.88</u>	
	+ 12,435	Hours flown in quarter
	27.26	Airlift fund flying-hour modifications cost
	x 4,967.1	Hours flown in airlift
	<u>\$ 135,403.15</u>	Modifications cost applicable to airlift

C-141	\$ 683,600	Modifications cost
	<u>- 102,540</u>	Residual value (15%)
	581,060	
	x 258	Number of aircraft
	<u>149,913,480</u>	
	+ 14	Airlift fund life of aircraft in years
	10,708,105.71	
	+ 4	Quarters in year
	<u>2,677,026.43</u>	
	+ 82,132	Hours flown in quarter
	32.59	Airlift fund flying-hour modifications cost
	x 13,584.2	Hours flown in airlift
	<u>\$ 442,709.08</u>	Modifications cost applicable to airlift

Pay:

C-5	\$ 2,337.23	Airlift fund figure for military pay accelerated 60%
	<u>- 1,460.77</u>	Airlift fund military pay (see p. 25.)
	876.46	Difference
	x 4,967.1	Hours flown in airlift
	<u>\$ 4,353,464</u>	Military pay applicable to airlift

C-141	\$ 823.12	Airlift fund figure for military pay accelerated 60%
	<u>- 514.45</u>	Airlift fund military pay (see p. 25.)
	308.67	Difference
	x 13,584.2	Hours flown in airlift
	<u>\$ 4,193,035</u>	Military pay applicable to airlift

Summary of Airlift Costs

Unfunded costs not billed according to MAC's Airlift Service Industrial Fund	\$20,550,131
Interest on investment	9,955,728
Research and development	5,154,658
Major aircraft modifications	578,112
Military pay	8,546,499
Depreciation of mission-support equipment	<u>318,308</u>
Costs not billed	\$45,103,436
Costs billed	<u>43,414,848</u>
Total cost of airlift services provided to Israel	<u>\$88,518,284</u>

\*Figure represents \$23,072,240 (see p. 25) as adjusted for changes in depreciable value of aircraft not reflected in Airlift fund cost data.

†Figures for computation obtained from the Air Force Office of the Comptroller (daily interest x number of days used for airlift).



ASSISTANT SECRETARY OF DEFENSE  
WASHINGTON, D.C. 20301

INSTALLATIONS AND LOGISTICS

22 JAN 1975

Mr. F. J. Shafer  
Director  
Logistics and Communications Division  
United States General Accounting Office  
Washington, D. C. 20548

Dear Mr. Shafer:

This is to acknowledge receipt of your letter of October 23, 1974, to the Secretary of Defense which forwarded for our review and comment copies of your draft report "Airlift Operations of the Military Airlift Command During the 1973 Middle East War," OSD Case No. 3931.

In that certain aspects of the report and its recommendations are requiring further intensive study, we will necessarily be unable at this time to fully respond to the report. However, our initial comments and observations regarding this draft report are enclosed as a partial reply. The final comments of this office will be forwarded as soon as possible.

Sincerely,

A handwritten signature in cursive script that reads "A. I. Mendolia".

ARTHUR I. MENDOLIA  
Assistant Secretary of Defense  
(Installations & Logistics)

Review of Draft GAO Report, "Airlift Operations of the Military Airlift Command During the 1973 Middle East War"

1. Subject report is basically factual and accurate. However, there are several serious misinterpretations of the facts which were amassed. These pertain primarily to contingency planning, the utility of the airlift as measured by amount and type of equipment delivered prior to the cease-fire, and the efficiency of management of airlift. These misinterpretations are discussed in detail in subsequent paragraphs.

2. The draft report states at various places (e.g., pages 2, 3, 13, 15) that the DoD did not have a contingency operations plan for the Middle East and recommends (pages 8, 48, 49, 54) that SecDef develop such a plan. The report states on page 14 that "Under the Nixon Doctrine the United States is obligated to support friendly countries in emergencies by providing, when needed, military supplies and equipment necessary to maintain a balance of power." (Emphasis added).

a. Neither Mr. Nixon's Guam statement of 25 July 1969, which was the first formulation of the "Nixon Doctrine," nor his Report to the Congress of February 18, 1970, "US Foreign Policy for the 1970's: A New Strategy for Peace," support this formulation of the doctrine. In the latter document (page 55-56), in discussing Asia and the Pacific, Mr. Nixon summarized the key elements of the doctrine as:

"-The United States will keep all its treaty commitments.

"-We shall provide a shield if a nuclear power threatens the freedom of a nation allied with us, or a nation whose survival we consider vital to our security and the security of the region as a whole.

"-In cases involving other types of aggression we shall furnish military and economic assistance when requested and as appropriate. But we shall look to the nation directly threatened to assume the primary responsibility of providing the manpower for its defense."

b. In the context of the Nixon Doctrine, the DoD plans with selected countries the development of programs to fulfill their legitimate defense needs. These plans are reflected in the Security Assistance legislation proposed to the Congress annually.

c. (See GAO note below.)

d. Contingency plans for the emergency logistic support of "a nation allied with us, or a nation whose survival we consider vital to our security and the security of the region as a whole" can only be developed if that nation is willing to provide the data necessary. Such data includes such things as weapons systems in their armed forces, the density of such weapons systems, the level of stocks on hand to support each weapon system, projected consumption rates under various conditions of combat, the "length" of the in-country pipeline, etc. Most countries are extremely reluctant to provide such data. In fact, Israel refused, during the height of their logistic crisis experienced in the October War, to provide some such information. Provision of such information would permit US authorities to develop rather precise estimates of the strategic planning and goals of the nation involved, something which most nations hold extremely close within their own circles. As a result of the Israeli refusal during the October War to provide some of the data requested, US authorities had no basis on which to judge the criticality of items and amounts thereof requested by the Israelis. Further, they were unable to analyze the Israeli logistic situation and to project or anticipate potential requirements.

e. Even if contingency plans for the emergency logistic support of allies had been developed, the Congress had not approved the procurement of stocks for such a purpose. Therefore, the emergency logistic support of Israel had to come from stocks procured primarily for the support of US forces. If the DoD is to be charged with the mission of developing contingency plans for the emergency logistic support of allies it must receive Congressional approval and the funding necessary to procure sufficient stocks to permit fulfilling the emergency requirement without degradation of the readiness of or the capability to support US Forces.

3. The draft report states at various places (pages 5, 17, 21, 22, 25, 52) that only 39% of the 22,497 tons of material airlifted by MAC arrived before the cease-fire, that the majority of the 72 outsize items did not arrive until after the cease-fire or the arrival of the first ship, and that, in GAO's opinion, the airlift of such equipment in such small quantities did not have a decisive effect on the outcome of the war.

GAO note: Paragraph deleted due to security classification.

a. As noted on page 16 of the draft report, US logisticians designated the original division between airlift and sealift of material to be provided Israel. This was done because the Israelis would not or could not stratify their priorities at the time such priorities were required. The Israeli priorities, when received, primarily applied to emergency requirements for ammunition and repair parts. The US logisticians originally designated for surface lift between 3/4 and 5/6 of each type ammunition to be provided and all the tanks, self-propelled howitzers, HAWK batteries, and other vehicles.

b. The outsize items were airlifted, as attributed to MAC officials on page 23, to demonstrate that the US had the capability, will, and resolve to airlift that kind of equipment in an emergency. A secondary purpose was to provide a "shot in the arm" to Israeli morale, a purpose which was successfully achieved as graphically attested to by Mrs. Meir's statement of the impact on her of the sight of the first tank rolling off a C-5.

4. The draft report states (pages 8, 48, 50) that MAC learned: that it should in large measure, control the flow of aircraft; that requirements should be levied on MAC in terms of types of cargo to be moved, number of passengers to be moved, and time frames for movement; and that equipment and supplies to be airlifted should be moved by surfact transportation or feeder aircraft to a relatively small number of selected on-load points.

a. Neither MAC nor the US logisticians needed to learn the first two points. This was recognized at the outset, and attempts were made to accomplish the support in that fashion. The "troublesome problem," cited on pages 2 and 15, of the method by which support was to be provided, and the rate at which airlift could proceed, once the decision to employ MAC was made, were both due to political factors and not due to any lack, on the part of MAC and the US military involved, of recognition of requirements or inability to plan for the efficient movement of materiel once provision of such materiel was approved.

b. USREDCOM was tasked, effective 23 October 1973 to support MAC with C-130 airlift to consolidate at major on-load points small quantities of materiel coming from widely scattered locations. Such support was used repeatedly thereafter. In addition, such systems as LOGAIR and QUICKTRANS were used to consolidate small shipments at major on-load points.

c. Several on-load points, e. g., Wright-Patterson AFB and Little Rock AFB, not normally used by MAC were designated for use in this operation because of the proximity of these bases to the source of heavy tonnage items. While this caused some augmentation of airlift control capabilities at these bases, it was necessary because of the need to reduce the length of surface transportation hauls for the heavy tonnage items.

**ASSISTANT SECRETARY OF DEFENSE**

WASHINGTON, D.C. 20301

MAR. 20, 1975

**INSTALLATIONS AND LOGISTICS**

Mr. F. J. Shafer  
Director  
Logistics and Communications Division  
United States General Accounting Office  
Washington, D. C. 20548

Dear Mr. Shafer:

This is in further response to your letter of October 23, 1974, to the Secretary of Defense which forwarded for our review and comment your draft report "Airlift Operations of the Military Airlift Command During the 1973 Middle East War," OSD Case No. 3931.

The initial comments of this Department were forwarded to you by our memorandum of January 22, 1975. Attached herewith are our final additional comments and observations relative to your above referenced report.

Sincerely,

  
JOHN J. BENNETT  
Principal Deputy Assistant Secretary of Defense  
(Installations and Logistics)

Enclosure

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DoD Additional Comments and Observations Relative to the Draft  
GAO Report "Airlift Operations of the Military Airlift Command  
During the 1973 Middle East War" OSD Case No. 3931

GAO statement - MAC should continue its efforts to provide an operational in-flight refueling capability for the C-5 aircraft.

DoD comment - MAC aerial refueling (AR) training program is well advanced. As of 1 November 1974 there were 27 crews fully qualified in AR procedures. A total of 77 crews were fully qualified by the end of December 1974.

GAO statement - MAC's command and control operations for emergency situations should be improved

DoD comment - Subsequent to the US airlift to Israel, the MAC Contingency Support Staff has expanded its briefing aids, communications and working areas to provide more flexibility for emergency response and capability in command and control of such operations.

GAO statement (page 7) - "Services to airlift equipment and supplies to Israel were provided under the Foreign Military Sales Act of 1968. According to the act, goods or services provided to foreign governments shall be billed to recover the total cost incurred by the United States. In billing the airlift services, MAC did not include all of its costs. As a result, Israel was billed at least \$43.5 million less than the cost of the services. However, Headquarters U.S. Air Force believes that the amount underbilled was only about \$14.1 million."

DoD comment - The Foreign Military Sales Act (22 U.S.C. 2761) provides for payment not "less than the value" for goods or services. The term, "total cost," is an interpretation made by the GAO. The Non-U.S. Government Rate Tariffs published in AFR 76-28 are developed at Headquarters USAF because of the application of the tariffs to all Air Force commands. Although data provided by MAC are used in the construction of rates for certain aircraft, MAC does not directly formulate such rates. MAC, therefore, is not responsible for including "all of its costs." The third sentence in the paragraph should be corrected to read, "In billing the airlift services, not all costs were included." The statement that Israel was billed at least \$43.5 million less than the cost of the services is not concurred in. As indicated in the GAO report, the initial billing to Israel was made using

rate tariffs published in AFR 76-28 in 1970. Work was in progress during the Israeli billing period to update this regulation. This included identification of cost components to be included to assure compliance with published DoD policies and determination of methodologies to be used for costing these components for AFR 76-28 tariffs. Following extensive analysis, positions were reached, in concert with the Office of the Assistant Secretary of Defense (Comptroller), on all components and methodologies except interest on investment. MAC was advised of the new rate, which increased the amount to be billed by about \$14.1 million, and the fact that the billing should not be closed pending determination of a DoD policy with respect to interest on investment. The rate included computation of aircraft depreciation by a methodology which provides for the determination of depreciation based on time, i. e., daily rate. This results in a significantly lower depreciation cost from what would be derived from the methodology used by MAC, and the one used by the GAO in reaching its conclusion that Israel had been under-billed by at least \$43.5 million. The methodology for computing depreciation developed by the Air Force, in concert with the Office of the Assistant Secretary of Defense (Comptroller), is believed to meet acceptable accounting practices and is consistent with those used by industry in the transportation field. The Air Force, therefore, believes that the amount billed is correct subject to a possible adjustment for interest on investment.

GAO statement (Page 8) - "The Secretary of the Air Force and MAC should continue their efforts to . . . properly bill the Government of Israel for all of the airlift services provided. "

DoD comment - The Government of Israel has been properly billed for all of the airlift services provided subject to an adjustment for interest on investment.

GAO statement (Page 10) - "The total MAC operating budget for fiscal year 1974 was \$1.7 billion . . . Aircraft depreciation amounted to \$270 million. "

DoD comment - The implication of this paragraph is that aircraft depreciation is funded when, in fact, it is only recorded as a statistical cost. Further, although the amount shown for the aircraft depreciation was computed in accordance with procedures in AFM 170-12, "Airlift Service Air Force Industrial Fund," this procedure is now under review. Deletion of this sentence is recommended.

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GAO statement (Page 15) - "US commercial air carriers were approached to obtain airlift capability to augment the small Israeli fleet being used to airlift material from the United States. The international scheduled carriers were opposed to furnishing such airlift primarily because US military aircraft were not operating in the war zone, aircraft losses would not be indemnified, and expected retaliation by the Arabs."

DoD comment - For purposes of clarity and accuracy it is recommended that this paragraph be rewritten as follows: "US commercial air carriers were approached to obtain airlift capability without invoking the provisions of the CRAF agreements to augment the small Israeli fleet being used to airlift materiel from the United States. The international scheduled carriers were opposed to furnishing such airlift unless the CRAF provisions were invoked primarily because US military aircraft were not operating in the zone and because of possible retaliation by the Arabs."

GAO statement (Page 38) - "This directive, which is based on the Foreign Military Sales Act, also states that foreign governments shall be charged at rates determined to secure reimbursement to total costs including unfunded costs."

DoD comment - DoD Directive 7410.4 is based on Section 2208 of title 10, U. S. C., and not the Foreign Military Sales Act.

GAO statement (Page 39) - "Accordingly, had MAC's current recorded costs, as shown below, been applied to compute the billings, instead of the rates shown in the four-year old Air Force regulations, the billings would have been at least \$23 million more. The \$23 million mainly represents unfunded costs for military pay and aircraft depreciation."

DoD comment - As stated in the comments regarding page 7, MAC's recorded costs are not applied to compute billings for airlift service provided under the provisions of AFR 76-28. The billings are to be computed by MAC based on AFR 76-28 tariffs. While \$23 million represents the statistical costs recorded by MAC for military pay and aircraft depreciation in accordance with AFM 170-12, it is not the billing cost.

GAO statement (Page 39) - "Prior to preparing the billings, the Deputy Director of the Airlift Services Industrial Fund contacted the Comptroller's Office, Headquarters USAF, and requested guidance as to the rates to be charged for the Israeli airlift."

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DoD comment - The words, "the Comptroller's Office" should be deleted. The office contacted was that of the Director of Transportation.

GAO statement (Page 40) - "The costs of other items such as interest on the Government's investment, research and development, aircraft major modifications, and pay for military support personnel were not recovered in MAC's billing for Israeli airlift services. ... We believe, however, that the including of these costs would increase the amount not billed to about \$43.5 million."

DoD comment - MAC uses Non-U.S. Government Rate Tariffs provided in accordance with AFR 76-28 for computing the cost of providing airlift services for non-U.S. Government users. As stated previously, these tariffs are developed by Headquarters USAF. The rate given to MAC, which increased the billings to Israeli by \$14.1 million, included the cost of research and development, aircraft major modifications, and pay for military support personnel. As stated previously, inclusion of interest on the Government's investment is still under consideration. If included, the billing would be increased another \$10.0 million. This would make the total increase about \$24.0 million rather than \$43.5 million.

GAO statement (Page 41) - "MAC does not charge the unfunded costs for research and development, aircraft major modifications and pay for military support personnel under its policy of charging only industrial fund direct cost to airlift services. Since these costs are also substantial, they should generally be recovered under the full user charges policy."

DoD comment - As indicated above, the unfunded costs cited are included by Headquarters Air Force in computing the tariff rate to be used by MAC

GAO statement (Page 44) - "We believe that the inclusion of the cost of interest on investment and the proper computation and allocation of depreciation charges would increase the Air Force's recomputed billing rate by about \$29.5 million."

DoD comment - As stated previously the inclusion of the cost of interest on investment is still under consideration by DoD. The charges for depreciation have been computed in accordance with generally accepted accounting principles and are similar to those used by industry.

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PRINCIPAL OFFICIALS RESPONSIBLE  
FOR ACTIVITIES DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
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<u>DEPARTMENT OF DEFENSE</u>		
SECRETARY OF DEFENSE:		
James R. Schlesinger	June 1973	Present
DEPUTY SECRETARY OF DEFENSE:		
William P. Clements, Jr.	Feb. 1973	Present
ASSISTANT SECRETARY OF DEFENSE (INSTALLATIONS AND LOGISTICS):		
Arthur I. Mendolia	Apr. 1973	Present
ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER):		
Terence E. McClary	May 1973	Present
ASSISTANT SECRETARY OF DEFENSE (PROGRAM ANALYSIS AND EVALUATION):		
Leonard Sullivan	May 1973	Present
ASSISTANT SECRETARY OF DEFENSE (INTERNATIONAL SECURITY AFFAIRS):		
Robert Ellsworth	June 1974	Present
A. A. Jordan	Apr. 1974	June 1974
Ray Peet	Jan. 1974	Apr. 1974
Robert C. Hill	Oct. 1973	Jan. 1974
CHAIRMAN, JOINT CHIEFS OF STAFF:		
Gen. George S. Brown	July 1974	Present
Adm. Thomas H. Moorer	July 1970	July 1974
<u>DEPARTMENT OF THE AIR FORCE</u>		
SECRETARY OF THE AIR FORCE:		
John L. McLucas	July 1973	Present

Tenure of office  
From                      To

DEPARTMENT OF THE AIR FORCE (continued)

ASSISTANT SECRETARY OF THE AIR FORCE:  
(INSTALLATIONS AND LOGISTICS):

Frank A. Shrontz	Oct. 1973	Present
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COMMANDER MILITARY AIRLIFT COMMAND:

Gen. Paul K. Carlton	Sept. 1972	Present
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DEPARTMENT OF THE ARMY

SECRETARY OF THE ARMY:

Howard H. Callaway	May 1973	Present
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DEPARTMENT OF THE NAVY

SECRETARY OF THE NAVY:

J. William Middendorf II	June 1974	Present
J. William Middendorf II (acting)	Apr. 1974	June 1974
John W. Warner	May 1972	Apr. 1974



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