

Airlift tends to get a low priority in peacetime, but that changes when conflict begins.

The Evolution of Air Mobility

By Bruce D. Callander



In 1908, the Army contracted with the Wright brothers to develop and produce the service's first airplane. Among numerous other stipulations of this historic agreement was a requirement that the Wrights deliver a flying machine small enough to be hauled in a big Army wagon.

Today, the Air Force's airlifters are enormous, and it is they who haul the Army's biggest vehicles, rather than the other way around. Moreover, experts predict, tomorrow's transports will be able to haul massive loads to any point on Earth within an hour, defend themselves en route, and land on parking lots.

It is this striking evolution of military airlift over the past century that formed the basis of a wide-ranging Air Mobility Symposium held late last year at Andrews AFB, Md., where it was sponsored by the Air Force Historical Foundation, the Office of the Air Force Historian, and Air Mobility Command.

In three sessions, experts explored the early development of airlift, the lessons learned in operations stretching from World War II to the Gulf War, and the probable shape of mobility in the next century. The conclusion of most papers was that airlift too often has been given low

priority in peacetime and has had to play catch-up after conflicts erupt.

Roger G. Miller, a senior historian with the Air Force History and Museum Program, traced the path of air mobility from the very earliest days of flight to 1915. It was in that year that Capt. Benjamin D. Foulois took command of the 1st Aero Squadron in Texas and equipped it with eight Curtiss aircraft and 11 trucks, including a mobile machine shop. When the squadron joined Gen. John J. Pershing's ground forces for the punitive expedition into Mexico, its airplanes carried the pilots, their rations, and spares.

Despite heavy fire, airlifters managed to deliver more than 300,000 pounds of supplies and equipment each day to support Marines at Khe Sanh during the Vietnam War. Here a C-130 drops off a load during the early days of the siege.





Infantrymen load a reluctant "piece" of cargo aboard this C-47, a modified commercial transport, for its flight over the "Hump." Airlift crews flew in 100 percent of the supplies used by US forces in the China-Burma-India Theater during World War II.

Through most of World War I, surface vehicles still hauled most cargo. Despite their notable technological improvements over the war years, aircraft still had little range or carrying capacity and depended on fixed bases. During the 1920s, however, commercial aviation began to blossom, and the Army began to take a strong interest. It set up the "Model Airway" to transport government officials and priority cargo. In the beginning, most of the Army's haulers were bombers with limited capacity. When the service did finally buy commercial carriers, they were designed for passengers, not cargo.

As the aircraft began to mature, Maj. Hugh J. Knerr, who was then the chief of the field service section for Air Corps Materiel Division, launched an air resupply system. He urged the Air Corps to buy airplanes built specifically to transport cargo, and, by the mid-1930s, the Army began looking at advanced carriers, such as the Douglas all-metal DCs, for this very purpose.

The Big War

World War II, of course, brought enormous advances. Even before the US became directly involved in the fighting, a buildup of major proportions had been launched. The Army had bought and begun construction of 600 C-47s and 60 four-engine C-54s by the time Japanese forces attacked Pearl Harbor in December 1941. However, they were far from

delivery and would not enter action for some time. Of the 12,297 military aircraft actually in the US inventory, only 254 were transports, most of them light carriers.

The world war generated an immediate demand for far more transport airplanes than planned and for more extensive uses than anyone could have imagined in the prewar days. By war's end, said Miller, air transport had been firmly established as the third leg of the nation's developing air strategy.

According to Daniel L. Haulman, a historian with the Air Force Historical Research Agency, the war also proved the need for specialized cargo aircraft. The Army Air Forces acquired more than 10,000 Douglas C-47s, 3,000 Curtiss C-46s, and some Lockheed C-69s and Douglas C-54s. However, all were conversions of commercial aircraft and as such proved to be hard to load and unsuited to oversize cargo. Germany also used a commercial carrier for its trimotor Ju-52/3M, an air transport, troop carrier, and glider tow, and it faced the same limitations.

During the war years, the US did produce one aircraft specifically designed for airlift. The low-slung Fairchild C-82 (forerunner of the C-119) had a high wing and rear door for easy loading, a high tail for parachute drops, and range and lifting capacity close to the C-54's. Unfortunately, the first delivery was in June 1945, when the European

war was over and Japan was nearing defeat.

Despite their limitations, the transport aircraft on both sides proved themselves invaluable in new forms of warfare. Germany dropped paratroopers to invade the Low Countries and air-dropped soldiers to take Crete. The Allies launched airborne strikes in North Africa and Sicily and, on D-Day in June 1944, used 900 transports and 400 gliders to deliver onto the Continent more than 13,000 paratroopers.

Airlift proved to be an effective means for sustaining armies in the field. Airdrops relieved troops pinned down at Bastogne in the Battle of the Bulge, and transports flying the Asian "Hump" supplied forces in China when seaports were blocked. In the Pacific, forces depended on regular air deliveries of fuel and supplies to sustain the island-hopping offensive.

However, the war underscored the need for centralized control of airlift, according to the symposium experts. Early on, local commanders often diverted carriers for their own purposes. In time, Air Transport Command gained more power, but the struggle between theater and global control continued, as did problems of coordination between air and ground forces. The need for better airlift scheduling was only too apparent in the Allied invasion of southern France, an operation in which several closely spaced gliders collided. Setting up multiple traffic lanes and variable altitudes and speeds helped.

Also helpful were improved navigation aids such as pathfinder aircraft to mark landing and drop zones, radar to spot ground drop targets, and en route radio stations for Hump flights. Still, better navigation aids were needed.

One overall lesson of the war, Haulman said, was the fact that air superiority is essential to the success of airlift missions. Many German transports were shot down for lack of it, and Allied efforts were almost invariably successful when they had it.

Cold War Airlift

Airlift emerged from World War II as the most flexible component of airpower, said Roger D. Launius, chief historian of the National Aeronautics and Space Administration. Because the military role is to fur-

ther national defense and diplomatic objectives, he said, the more flexible the tool, the more useful it is. That flexibility was demonstrated in the first crisis of the Cold War, the Berlin Airlift. No other response could have maintained Allied presence and avoided conflict.

When the Soviet Union set up a blockade of land corridors into West Berlin, Brig. Gen. Joseph Smith, US military commander of Wiesbaden, West Germany, set up an air bridge and a closely timed supply schedule. Later, the new Military Air Transport Service took over and put Maj. Gen. William H. Tunner, architect of the World War II Hump lift, in charge.

As in World War II, the airlift became the center of jurisdictional battles, with Tunner's staff expecting to run an independent operation and USAFE demanding more control of the action. Despite such conflicts, the lift fell into what Tunner called a necessary steady rhythm with a logistics system to support the flow and a maintenance system to keep the airplanes running. Aircraft were assigned specific altitudes and speeds and tracked by radar. One pilot, Jack O. Bennet, said they were like pearls on a necklace.

To shorten the amount of time spent on the ground, operations and weather officers met the airplanes when they landed. Pilots unable to land visually were sent back with their loads. Time-study experts cut unloading



The Berlin Airlift quickly settled into a steady pace despite jurisdictional battles. However, Maj. Gen. William H. Tunner was convinced of the need for a single command and larger aircraft. Here, airfield crews prepare a C-54 at Wiesbaden AB, Germany, to carry another load into beleaguered Berlin.

time by two-thirds and refueling time by three-fourths. Turnaround time eventually dropped from one hour to 30 minutes.

Like World War II, the Berlin Airlift was a learning experience. Tunner emerged from it arguing for a single airlift command and for larger cargo aircraft, as the only way to increase the flow in saturated air corridors.

Korean Woes

World War II and the Berlin Airlift had not prepared the Allies for the next Cold War crisis, however. At the outbreak of the Korean War,

MATS was better equipped to deliver troops and supplies to the theater, but, within Korea itself, airlifters faced a whole new set of problems, said William T. Y'Blood of the Air Force History Support Office. Intra-theater transport responsibilities fell to Far East Air Forces, which had only two troop carrier squadrons (with 13 C-54s each) in 5th Air Force and another with 13th Air Force in the Philippines.

Gen. Douglas MacArthur's first major order—for the evacuation of civilians—caught FEAF with most of its major carriers scattered for other duties. Commanders mustered seven of the big airplanes along with 10 C-47s and four C-46s and brought out about 850 people. The delivery of troops and supplies was harder. The C-54s proved too vulnerable and too heavy for available airfields. FEAF turned to C-47s and C-46s.

When the North Koreans pushed the defenders back, FEAF mounted an emergency airlift and called the third squadron of C-54s in from the Philippines. Still, the requirements overwhelmed the available resources. Often, demands were unrealistic. Instead of using available water transport, units wanted airlift for even routine cargo. Scheduling and maintenance became a shambles. Officials said some central agency was needed to rule on which cargo required airlift and which could move by surface transport.

Meanwhile, FEAF, helped by the



The C-119 Flying Boxcar, one of the first military-specific transports, supported US troops during the Korean War. Maintaining a breakneck pace, the few available C-119s began to suffer maintenance problems from overuse.

addition of newer carriers such as the C-119, supported the Inchon landing and the push into North Korea. Before long, it was delivering 800 to 900 tons per day from Japan to Kimpo, and that pace steadily increased.

When officials thought the war was about over, however, Chinese Communist forces moved in, UN forces fell back, and FEAF mounted a massive support effort. Through the winter of 1950-51, Combat Cargo Command airlifted ammunition and other supplies to ground forces at a breakneck pace. At one point, it airdropped an eight-span bridge so that retreating Allied troops could bring out their equipment.

Eventually, UN forces recovered and headed north again. Airdrops tapered off and landings increased. The C-119 became the transport of choice, but FEAF had a limited number of them. Overuse produced maintenance problems. USAF sent newer C-124s, but their weight limited them to a few fields, and they developed fuel leaks and generator problems.

The Korean War again underscored the need for specialized aircraft. The available airplanes (from C-47s to C-124s) often were unsuited for the demands of small wars. USAF began development of new airlifters such as the Fairchild C-123 and the Lockheed C-130 Hercules. This still did not settle the old questions of jurisdiction. Both the Army and some elements of the Air Force wanted

control over airlift for their own purposes.

After Korea, some basic airlift problems were still papered over, said retired Air Force Col. Raymond Bowers, director of the Southeast Asia Branch in the Air Force History Support Office. Vietnam, a war without fronts, exposed the shortcomings and posed new difficulties.

In the late 1950s, USAF airlift doctrine had put troop carriers under Tactical Air Command in the US and under theater commanders overseas. It called for landing troops onto prepared runways and gave little attention to developing aircraft for rough terrain, for which the Army's answer was organic transport with helicopters. The Army and Air Force often were at odds over the best aircraft to use, and both largely ignored problems of aerial port, medical evacuation, communications, and control.

The Vietnam Experience

As US efforts grew in Vietnam, USAF used C-47s and C-123s, both of which had limitations. Army helicopters proved inadequate for heavy hauling. Its fixed-wing Caribou airplanes were better suited to the primitive airfields but had little capacity.

With the major buildup after 1964, airlift requirements increased sharply, and, fortunately, USAF now had Lockheed C-130s. The services agreed that the Hercules should be used routinely and the availability

of airstrips suitable for them became an element in planning operations.

The Army and Air Force also worked out effective operations at various levels, but some problems remained. As Bowers said, the stage was set for a postwar decision to organize tactical and strategic airlift under a specified command.

While the services were working out their tactical airlift problems in Korea and Vietnam, they struggled with the equally important challenge of strategic transport.

With the World War II demobilization, it was clear that future wars would require even more massive airlifts and that smaller peacetime forces would not have enough in-house transports to meet them all. Col. Ronald N. Priddy, USAF (Ret.), vice president for safety operations with the National Air Carrier Association, described the evolution of what would become the Civil Reserve Air Fleet.

As early as the 1930s, Brig. Gen. William L. Mitchell had proposed that all aviation developments be led by the military, but the US chose to encourage a separate commercial carrier system that could be drawn on in emergencies.

Even before it entered World War II, Army Air Corps Ferrying Command contracted with Pan American Airways to deliver some lend-lease aircraft to Britain. After Pearl Harbor, the AAF bought or commandeered transports from the airlines, which also provided training for military transport pilots and continued to fly airlift while the AAF built its own resources. During the Berlin Airlift, airlines replaced military transports on many intercontinental routes, and in Korea, they supplied much of the initial airlift.

In the 1950s, a government commission studied a more permanent program for using civilian resources in national emergencies. The result was CRAF. By the Gulf War, it represented more than 50 percent of the nation's airlift capability, and, for the first time in its nearly 50-year history, it was activated for a combat operation.

The Desert War

The Gulf buildup, Operation Desert Shield, soon became the most massive airlift in the history of airpower, said John W. Leland, senior



The huge C-5 (background) and the C-141—each undergoing extensive modernization efforts over the years to extend their useful lives—have been “modern” mainstays of USAF’s airlift fleet.



USAF airlifters, such as this C-141, are in near-constant demand as the Pentagon engages in increasing numbers of Military Operations Other Than War, like this humanitarian airlift to Africa.

historian of Air Mobility Command. CRAF and USAF airplanes flew more ton-miles in six weeks than during the entire 15-month Berlin Airlift.

To support the 7,500-mile pipeline to the Gulf, the Air Force used not only its own carriers and en route tankers but commercial airline elements of the reserve forces.

For all its efforts to be prepared, however, Military Airlift Command did not have an approved transportation plan to fit Desert Shield. Gen. H.T. Johnson, commander in chief of US Transportation Command and MAC, later said a major result was that too many airlift users wanted to move troops and cargo quickly and MAC tried to satisfy them all. Often, too much or too little airlift was scheduled or the wrong type was used.

MAC set up a Requirements Validation Cell to recheck with requesting units to determine their true needs, but it was effective only to a point. Requirements changed quickly with developing operations, and officials later admitted some changes were inevitable.

Another complication was the lack of a staging base on the Arabian Peninsula so incoming crews could rest. MAC assigned extra pilots to the carriers and set up pilot pools at other bases to spell off the incoming crews. But a RAND Corp. study later reported that lack of an in-theater staging base had reduced the strategic airlift capability by 20 to 25 percent.

MAC fought many small fires. It

set up one-day express services in the US and Germany for high-priority cargo. When cargo piled up at US bases, it set up teams with representatives from all services to divert low-priority items to sealift. When CRAF airlines had problems getting war-risk insurance MAC cut the red tape, and when they refused to send crews within Scud range without chemical warfare gear and training, MAC provided both at en route stops.

But, again, Leland said, the operation showed the need for a single organization to control airlift and tanker forces, a need finally answered in 1992, with activation of Air Mobility Command.

Since the Gulf War, new problems have arisen. Some overseas bases have closed and others have been put on standby status so future operations may depend more on in-flight refueling. Some CRAF resources have been affected by airline failures, consolidations, and foreign funding.

On the bright side, the new C-17 offers advantages USAF did not have in the Gulf War. It carries twice the payload of the C-141, hauls outsize cargo, and uses austere airfields, freeing more ramp space for fighters.

Other recent contingencies have

given the services experience in supporting combat operations for the kind of post-Cold War situations they are likely to encounter in the future—those Maj. James Ayers of the Air Force Doctrine Center described as Military Operations Other Than War.

In Bosnia, Somalia, and Haiti, USAF carriers supported multinational forces and nongovernment organizations such as the Red Cross and CARE. From those experiences, Ayers said, leaders learned that even peacetime operations require security.

To increase safety, USAF now varies flight schedules, routes, and billeting arrangements. It uses Terrorist Assessment and Awareness Teams to provide force protection and anti-terrorist training at AMC locations and supplies trained teams called Ravens to accompany aircraft into high-risk areas.

Security will become even more important in the future, when even Third World nations gain more sophisticated strike platforms, said Maj. John R. Stafford, a former C-141 pilot now assigned to the Pentagon.

Future airlifters may well use everything from stealth technology to laser or microwave directed energy. AMC already has modified some C-141s with defensive flare systems, and countermissile missiles are another possibility being discussed. The use of pilotless airlifters also has been considered, but Stafford said it appears unlikely, particularly in aircraft carrying passengers.

Nor will future carriers necessarily be much larger, the major said. Rather, they are likely to be lighter and fly faster and, because of increased fuel efficiency, farther. Thus, they will deliver more goods faster than present carriers without added size per airplane.

One promising idea calls for a reusable launch vehicle able to reach orbit with a single stage. Even in suborbital flight, such vehicles could reach Mach 25, deliver payloads of up to 50,000 pounds anywhere on Earth within an hour, and land vertically on pads no larger than 300 square feet. ■

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