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FOR DOCTRINE DEVELOPMENT AND EDUCATION



AIR FORCE DOCTRINE PUBLICATION (AFDP) 3-36 AIR MOBILITY OPERATIONS

AIRLIFT OPERATIONS

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Airlift conducts several basic operations: passenger and cargo movement including operational support aircraft, combat employment and sustainment, [aeromedical evacuation](#) (AE), [nuclear](#) airlift, and [special operations](#) support. Air Force airlift forces perform these operations to create strategic, operational, and tactical level effects that support national objectives across the range of military operations.

Delivery Options

Payloads are delivered via two methods: airland or airdrop. Each method has its distinct advantages and disadvantages.

Airland Delivery

Airland delivery occurs when a transport or tanker aircraft lands and unloads its cargo. Airland is the preferred method of delivery because it is usually the most efficient, safest, and least expensive way to deliver personnel and cargo. Airland operations also allow for back-haul capability, including AE. Airland can be conducted in austere airfields with minimal ground support and security on a limited contingency basis. Extended basing operations require secure, suitable, and conveniently located airfields with appropriate air mobility support assets to facilitate offload. Sound operational procedures, well-planned base defense, and rapid offloading and onloading techniques associated with various airlift aircraft can minimize some of the constraints of airland delivery. Commanders should view airland delivery as the method of choice for most air movements.

Advantages of Airland over Airdrop Delivery:

- ✿ Provides greater unit integrity and rapid unit deployment after landing.
- ✿ Eliminates payload dispersal associated with airdrop.
- ✿ Carries the least risk of injuring personnel and damaging loads.
- ✿ Requires minimal specialized training and equipment for transported personnel.

- ★ Requires less special rigging and packaging of materiel than airdrop.
- ★ Permits the maximum use of allowable cabin loads by eliminating the volume and weight penalties of preparing loads for airdrop deliveries.
- ★ Maximizes the opportunity to backhaul cargo and evacuate personnel.

Constraints of Airland Delivery:

- ★ Requires suitable airfields or assault landing zones (ALZs) that are moderately level, unobstructed, able to sustain the aircraft's weight, of appropriate length, and available for the anticipated operation.
- ★ Increases intervals between aircraft deliveries depending on an airfield's infrastructure and support capability.
- ★ May require mission support such as ground-handling equipment, transportation assets, and onward movement and distribution networks.
- ★ Prolongs exposure to air or ground attacks.
- ★ Most effective with suitable lighting and instrument-approved equipment for anything other than day operations in good weather.

Operation DESERT STORM's Left Hook

From 18–28 January 1991, C-130s airlifted elements of the XVIII Airborne Corps from King Fahd International Airport to Rafha, in northern Saudi Arabia, near the Iraqi border. This intense airlift supported General H. Norman Schwarzkopf's flanking maneuver to the west, which he described as a "Hail Mary Pass." C-130s flew mission corridors at 10-minute intervals in radio silence. During the airlift, C-130 sorties increased from 200 to more than 300 daily and peaked at more than 350 sorties in one 24-hour period. Nearly 14,000 troops and over 9,300 tons of cargo were moved. General Schwarzkopf said of this fast-paced demonstration of air mobility: "I can't recall any time in the annals of military history when this number of forces has moved over this distance to put themselves in a position to attack."

—Air Mobility Command Historian

Operation VITTLES

In February 1948, a Soviet-backed coup seized power in Czechoslovakia tightening communism's grip on Eastern Europe. West Berlin remained as a lone democratic holdout in the communist sea. In June of that year Soviet forces closed all overland routes into West Berlin, isolating the city from the outside world. This development led to the first humanitarian airlift of the Cold War, and the largest in history. "We are going to stay, period!" remarked President Truman. The US would sustain the city through the air.

Before the blockade, the city imported 15,500 tons of materiel daily to meet its needs. Minimum requirement for survival was estimated at 4,000 tons a day. C-47s and C-54s were only able to airlift 80 tons of supplies on the first day of the operation. However, once maintenance inefficiencies, turn-around delays and air traffic flows were ironed out, tonnage airlifted increased. With the help of airlifters from the Royal Air Force, the daily tonnage to Berlin climbed to nearly 13,000. Operation VITTLES would eventually bring over 1.5 million tons of food, medicine, coal, and other supplies into West Berlin. For 462 days, the allies provided an airborne lifeline to West Berlin. By September 1949 the Soviets conceded that its blockade had failed, and reopened the roadways into Berlin.

Operation VITTLES preserved West Berlin, which became a democratic foothold in East Germany. This historic effort proved that joint and combined airlift capability could be massed under a single airlift task force commander to sustain an isolated city-sized population through only three airfields. Besides demonstrating US political commitment, the airlift proved the impetus for an expanded long-range heavy airlift fleet.

—Airlift Doctrine, Lt Col Charles E. Miller, USAF

Airdrop

Airdrop⁶ is defined as "the unloading of personnel or materiel from aircraft in flight." Most airdrop procedures use parachutes to deliver loads to the ground, such as heavy equipment, container delivery systems, and personnel. This delivery method allows rapid insertion of combat forces to numerous target areas. Another airdrop procedure is free fall delivery. This involves dropping relatively small items, such as packaged meals or unbreakable objects like hay bales without the use of a parachute. Airdrop allows commanders to project and sustain combat power into areas where a suitable airfield, ALZ, or a ground transportation network may not be available.

⁶ Common Access Card enabled site

Advantages of Airdrop over Airland Delivery:

- ✿ Uses principle of surprise in supporting combat operations.
- ✿ Minimizes aircraft and personnel exposure to threats at the target area.
- ✿ Permits sustainment deliveries to units operating away from airfields and ALZs.
- ✿ Permits the delivery of combat forces and materiel, concentrated and in mass, in minimal space and time.
- ✿ Permits the delivery of personnel and materiel in conditions that would prevent airland delivery operations.
- ✿ Eliminates the need for airlift ground support infrastructure and personnel.

Constraints of Airdrop:

- ✿ Carries an increased risk of injury to personnel or damage to cargo.
- ✿ Requires special training for riggers, transported personnel, and aircrew.
- ✿ Limits cargo loads because additional rigging is required for airdropped materiel.
- ✿ May decrease aircraft range due to low-level ingress or egress and formation tactics employed.
- ✿ Increases mission planning time and complexity; requires additional intelligence preparation.
- ✿ Increases cost of resupply due to decelerators, rigging, and lost opportunity of the additional cargo that could have been carried on an airland mission.
- ✿ Increases likelihood of dispersed airdrop cargo vs. airland delivery
- ✿ More susceptible to unfavorable weather conditions that may reduce the effectiveness of airdrop.

Operation ENDURING FREEDOM

Since 2005, yearly airdrop requirements have nearly doubled each year, from approximately 2 million pounds delivered in 2005 to an estimated 97 million pounds in 2011. Airdrop requirements will continue to grow as US and Coalition troops remain in forward operating bases (FOBs) over the course of the long war.

Not only have airdrop requirements increased, but they have also become much more challenging with the complex terrain, weather, an adept adversary, and the proximity of civilian populations to the FOBs. The MAF has met this challenge with more precise, flexible, survivable, and sustainable tactics, techniques and procedures (TTPs). As this airdrop requirement continues to grow, and we gather lessons learned from these missions, the TTPs will continue to adapt to the changing environment.

--2011 International Airdrop Symposium

Airlift Missions

There are a variety of airlift missions conducted across the range of military operations. The nature of what is to be carried drives the type of airlift mission. These missions are not mutually exclusive, and may be accomplished even on the same sortie. Different types of missions require differing levels of support, planning, experience, crew qualifications, equipment, and resources to complete. Missions may be subject to different constraints and operational guidance. Airlift missions at their core move people and cargo.

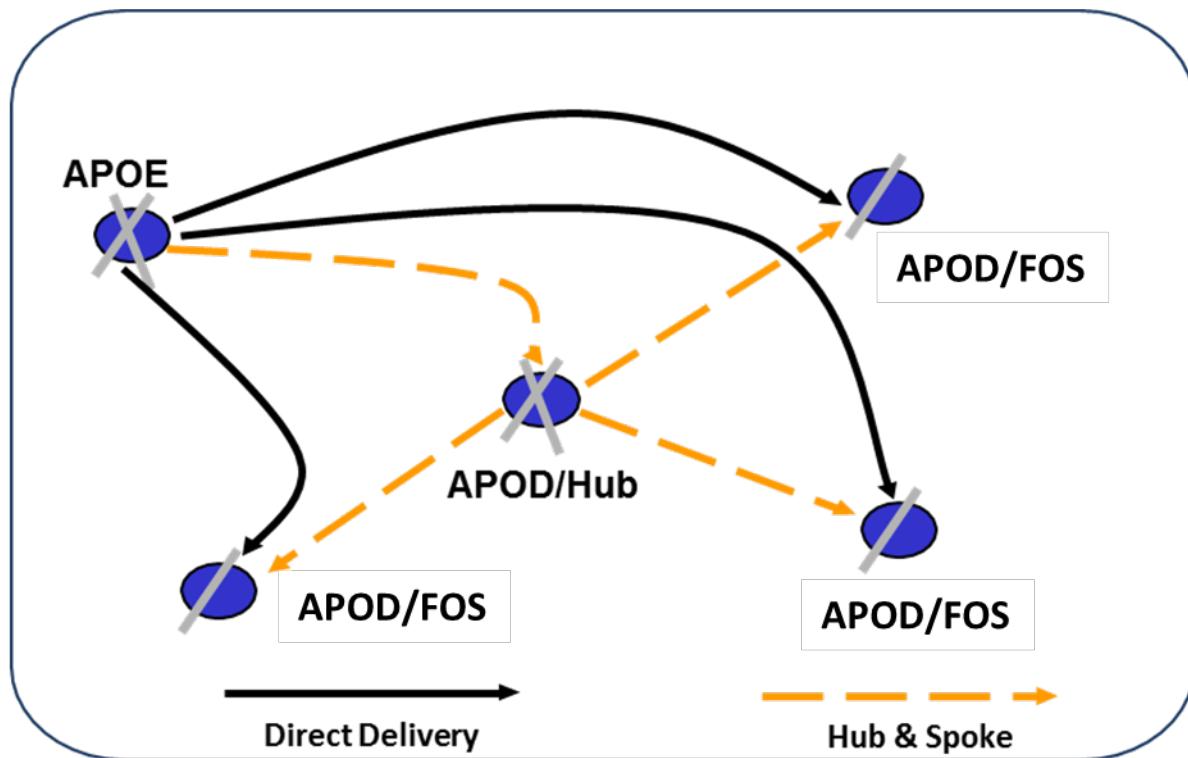
Airlift Employment Methods

The [commander, Air Force forces](#) (COMAFFOR) normally determines how best to employ [intertheater and intratheater](#) airlift operations in the theater or joint operations area (JOA) and when, based on the type of airlift operations and the dynamics of the environment, to assume command and control of intertheater airlift operations. The COMAFFOR may recommend that the [joint force commander](#) (JFC) request additional forces from the Secretary of Defense to meet the JFC's intent and objectives. The following discussion presents the different employment and delivery methods for airlift operations.

Hub and Spoke

Hub-and-spoke operations integrate both intertheater and intratheater airlift

operations. See the figure, “Employment methods; Direct Delivery and Hub & Spoke,” for an illustration of the hub and spoke concept. Starting from an aerial port of embarkation (APOE), the movement of cargo and personnel progresses through one or more en route staging bases to arrive at a main operations base (the hub) or aerial port of debarkation (APOD) within a theater.



Employment Methods: Direct Delivery and Hub & Spoke

APOD - aerial port of debarkation
APOE - aerial port of embarkation
FOS - forward operating site

The hub is the focal point for follow-on intratheater airlift missions. Cargo and personnel are processed and readied for transshipment by intratheater assets to forward operating sites (FOSs)—the spokes—throughout the theater. The hub and spoke method optimizes air mobility operations when supporting multiple operational commanders and operations. It permits load consolidation to maximize lift capability and allows for transload to specialized aircraft (e.g., landing zone (LZ)-capable, defensive system equipped, smaller aircraft, etc.). This method is comparable to a move that goes from door to central warehouse to door.

During contingency operations, especially against a peer- and near-peer adversary in a contested environment, intertheater hub-and-spoke deliveries may be restricted from landing at a particular APOD or FOS due to JOA dynamics (e.g., threats) and

consequently required to land at another location. In these scenarios, intertheater movements typically transload to intratheater forces for movement onward to the destination. To ensure this process flows properly, the [director of mobility forces](#) (DIRMOBFOR) should deconflict intertheater hub-and-spoke operations with the COMAFFOR.

Intertheater airland operations normally offload personnel and materiel at a main operating location within the theater. Subsequently, intratheater airlift moves designated personnel and equipment to forward operating sites. Units should consider the required materials handling equipment and transportation assets needed to transfer personnel, equipment, and cargo from one aircraft to another.

Intertheater Direct Delivery

Direct delivery is normally an intertheater flight that can bypass en route stops by airlifting personnel and materiel from the APOE directly to final destinations within a theater. It serves as the method of choice for timely, effective delivery of cargo and passengers. As with hub-and-spoke deliveries described above, during contingency operations, intertheater direct deliveries may be restricted from landing at a particular APOD or FOS due to JOA dynamics (e.g., threats) and consequently be required to land at another location. In these scenarios, intertheater movements typically transload to intratheater forces for the movement onward to the destination. To ensure this process flows properly, the DIRMOBFOR should deconflict intertheater direct delivery operations with the COMAFFOR.

Direct delivery has advantages and disadvantages associated with its effectiveness. The advantages include quicker arrival and an avoidance of transloading cargo to intratheater aircraft at an intermediate staging base. Direct delivery shortens in-transit time, reduces congestion at main operating bases, and enhances the sustainment of contingency locations. It also reduces cargo handling and transloading. The disadvantages include limited aircraft maintenance, cargo and passenger handling, parking, and less fuel servicing capability than a hub airfield, which may complicate mission planning. It also emphasizes the need for a full load going to a location to maximize lift capability. Direct delivery may also necessitate longer, less flexible flight profiles, which can reduce payload capability or require air refueling (AR) and augmented airlift aircrews, thereby increasing resource requirements. Direct delivery is at its optimum when carrying a full cargo load. This method is comparable to a move that goes from door to door.

Intratheater Direct Support (Theater Direct Delivery)

Direct support intratheater air mobility missions are coordinated between the [air operations center's](#) (AOC) [air mobility division](#) (AMD) and the joint deployment and distribution operations center (JDDOC), if one exists, and tasked by the appropriate AOC.

Stage, or "Lily Pad" Operations

Aircraft ranges, crew requirements, and mission limitations may dictate the need for intermediate stops, referred to as stage or “lily pad” operations. The final leg into the operational area may terminate at the final destination or at a theater hub. These intertheater operations leverage existing en route support locations and may place a heavier burden on the [Global Air Mobility Support System](#). In a contested environment, these “lily pad” locations may need to be used as more permanent basing options.

Intratheater Channel or Round Robin

Intratheater channel or Round Robin operations are regularly scheduled intratheater missions. These missions typically follow the same routing on the same days and allow predictability for users and planners, though may not always be efficient. This concept should be used when requirements are stable and predictable enough to allow sufficient use of the asset. The predictable nature of these missions may present an elevated threat risk in hostile or contested environments. The benefit is that no requirement to stop en route is necessary.

Contract Airlift

Contract airlift is a cost-effective method for delivery of combat supplies when US military assets are unavailable or unsuited for the mission. Several contract carriers now exist that specialize in logistics support. Their smaller, specialized aircraft are often more suitable for missions in remote areas where it is unsafe or ineffective to operate larger aircraft. The larger assets can provide alternative outsized cargo delivery options comparable to C-5s or C-17s.

Transload Operations

Transload is a concept for deploying into a high-threat operational area under conditions that restrict the use of strategic deployment assets (i.e., large aircraft such as the C-5 or KC-10 or Civil Reserve Air Fleet [CRAF] aircraft). In coordination with the affected geographic combatant commander, [US Transportation Command](#) (USTRANSCOM) establishes a transload operation outside the operational area at a safe installation permissive to civilian Department of Defense contract or CRAF operations. From this forward transload operation, MAF military aircraft equipped with aircraft defensive systems, if required, are used to complete the sustainment, evacuation, or delivery of personnel and materials on aircraft that can operate on more austere airfields. MAF use one or a combination of three deployment options: direct delivery to the theater, air-to-air transload, or air and sea transload (multimodal transload).

Transload operations are how the hub and spoke works. While an airbridge supports the movement of airlift aircraft from one location to another, transload operations involve

the transfer of assets from one aircraft or mode of transportation to another.

Multimodal Operations

USTRANSCOM conducts multimodal operations when combatant commanders place requirements moving large equipment items in volume. Recent examples entail moving US Army combat aviation brigade helicopters or several hundred vehicles to landlocked operational areas. Multimodal operations serve as USTRANSCOM's effort to achieve effectiveness and efficiency. An example of a multimodal operation is where equipment departs CONUS via sealift (the most economical means for transporting large equipment items) and arrives at a permissive seaport near the operational area. Success in seaport selection lies in securing an adjacent airfield capable of supporting wide-body aircraft operations. Upon port arrival, USTRANSCOM uses its ground transportation options in moving equipment from the seaport to the airfield. USTRANSCOM then uses cargo aircraft for the final leg placing the equipment in the operational area. This blend of sealift, ground transportation, and airlift serves as the most efficient and effective method of moving large numbers of large equipment items.

Airlift Control in Vietnam

The airlift system which evolved over the years spanned the entire country of South Vietnam. This enabled the US forces to exploit the inherent flexibility of airlift and ensure rapid response to priority and emergency requirements.

The system was tailored to the in-country logistics patterns. Basically, Vietnam comprised four logistics "islands," with shipping lanes and Military Airlift Command airlift channels connecting them to the [continental US] or Western Pacific supply sources....

From the Air Force point of view the key to responsive airlift was the centralized command and control structure which unified the various control elements into an airlift system. Objectives were positive control, continuous customer liaison, deployed turn-around capability, and real time monitoring of aircraft and cargo movements. A centralized control structure permitted the airlift commander to be in immediate contact with all flying units, operating locations, customer representatives, and aircraft in flight. The commander could redirect the airlift effort as required and thus respond to tactical demands.

—Tactical Airlift in Southeast Asia, a Project CHECO (Contemporary Historical Examination of Current Operations) Report, 1972