Transportation

CIVIL RESERVE AIR FLEET LOAD PLANNING

ACCESSIBILITY: Publications and forms are available for downloading or ordering on the e-Publishing website at http://www.e-publishing.af.mil/

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: HQ AMC/A3BC
Certified by: HQ AMC/A3B
(Merlin L. Lyman, GS-15)
Pages: 46

Supersedes: AMCPAM 24-2V4,
1 December 2001

This pamphlet series enables application of DTR 4500.9-R, Defense Transportation Regulation – Part III Mobility, Appendix V, Aircraft Load Planning and Documentation; as well as AMCI 10-402, Civil Reserve Air Fleet (CRAF). The guidance contained herein is applicable to all United States Air Force (USAF), Air Force Reserve Command (AFRC), Air National Guard (ANG) and Department of Defense (DOD) agencies whenever they are charged with using the CRAF assets contained herein, in accordance with DOD, inter-service, and/or Major Command (MAJCOM) agreements. This pamphlet series is intended as a load planning guide and provides the basic information, data, and technical specifications needed in order for planners (both long range and individual movement) to load plan aircraft in the Civil Reserve Air Fleet (CRAF). Equipment and methods listed are compatible with all CRAF aircraft and cargo areas discussed. It must be noted that, unlike military cargo aircraft, civilian airframes are not standardized, and can vary widely, even within each carrier’s fleet. Final approval, therefore, ultimately rests with the individual contractor providing airlift services to the Department of Defense (DOD). Ensure all records created as a result of processes prescribed in this publication are maintained In Accordance With (IAW) Air Force Manual (AFMAN) 33-363, Management of Records, and disposed IAW the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

Refer recommended changes and questions on this publication to the Office of Primary Responsibility (OPR) using AF Form 847, Recommendation for Change of Publication; route form through the appropriate functional command channel to: Headquarters (HQ) Air Mobility Command (AMC)/DOD Commercial Airlift Division A3B, 402 Scott Dr., Unit 3A1, Scott AFB,
This publication may be supplemented at any level, but all Supplements must be routed to the OPR of this publication for coordination prior to certification and approval. Submit requests for waivers through the chain of command to this Publication OPR for non-tiered compliance items. When new/additional information is received, it will be provided as a change to this publication. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items.

SUMMARY OF CHANGES

This publication is substantially revised and must be reviewed in its entirety. Major changes include: The series has been renumbered, reorganized, AMCPAM2-2 Volumes 4, 8, and 9 have been merged into this publication adding additional data to this product.

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Chapter 1

GENERAL INFORMATION

1.1. **Purpose.** This pamphlet series is non-directive in nature. It provides the basic information, data, and technical specifications needed in order for planners to more efficiently and effectively load plan commercial aircraft during CRAF activation. While most guidelines in this pamphlet are similar to those used in routine/non-activation operations involving commercial carriers, some changes come into play during actual CRAF activations.

1.2. **Scope.** CRAF aircraft specifications listed herein are current as of the date of this printing. Equipment and methods listed are compatible with all CRAF aircraft and cargo areas discussed. It must be noted that, unlike military cargo aircraft, civilian airframes are not standardized, and can vary widely, even within each carrier's fleet. Final approval, therefore, ultimately rests with the individual contractor providing airlift services to the DOD.

1.3. **Arrangement.** This pamphlet series is designed for easy reference and access to the most commonly needed information for planning purposes. Essentially, Volume 1 will contain all information common to the entire CRAF program and most, if not all, carriers. Volumes 2 through 4 contain information specific to a particular manufacturer’s airframes, with each sub-volume addendum addressing a different aircraft series or type. Each can be referenced separately from another; however, each addendum must be used in conjunction with Volume 1.

1.4. **Supplements.** Changes or supplements to this pamphlet by agencies, other than AMC, are prohibited. This does not preclude its use as a reference document for preparation of intra-agency instructional directives.

1.5. **Acronyms.** An explanation of the acronyms used in this pamphlet is in Attachment 1.

1.6. **Responsibilities.** The roles and responsibilities of various agencies supporting the CRAF program are beyond the scope of this publication; a more detailed explanation can be found in AMCI 10-402. The intent of this section is to give general guidance on what may be expected in the load planning process when assigned a CRAF carrier for movement.

1.6.1. **USTRANSCOM.** The Commander, US Transportation Command (TCCC), with the approval of the Secretary of Defense (SECDEF), can activate any of the three stages of the CRAF. Per Memorandum of Understanding (MOU), Department of Transportation (DOT) concurrence is required for allocation of aircraft for CRAF Stage III activation. CRAF aircraft may be selectively activated and used up to the full numbers composing whichever stage has been approved by the SECDEF. In addition, USTRANSCOM, through TCAQ-C generates, manages, and maintains the contracts and admission process into the CRAF program.

1.6.2. **Contract Administrators.** The Air Mobility Command Instruction (AMCI) 10-402 *Civil Reserve Air Fleet* and United States Transportation Command Instruction (USTRANSCOMI) 24-9 *Civil Airlift Programs* provide the policies and procedures for management of commercial airlift and CRAF related contracts, agreements, and programs. USTRANSCOM maintains overall administration of CRAF contracts, while the TCAQ-C Operating Locations (OL) generally manages the administration of their geographic or
regional area’s missions. While most users of this volume will go through normal channels (i.e., use of their service’s movement validation process) to make airlift requests, the following table is provided for information.

Table 1.1. Contract Administrators.

<table>
<thead>
<tr>
<th>Contract Administrator Office</th>
<th>Location</th>
<th>DSN Contact Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>USTRANSCOM TCAQ-CM</td>
<td>Scott AFB, IL</td>
<td>(312) 770-7077</td>
</tr>
<tr>
<td>OL-R TCAQ-CM</td>
<td>Ramstein AB, Germany</td>
<td>(314) 479-4215</td>
</tr>
<tr>
<td>OL-T TCAQ-CM</td>
<td>Yokota AB, Japan</td>
<td>(315) 225-8574</td>
</tr>
</tbody>
</table>

1.6.3. Individual CRAF Carrier (Contractor).

1.6.3.1. FARs. The contractor shall provide safe on-loading and off-loading, transportation, protection, accountability, and timely delivery of government cargo in accordance with applicable Federal Aviation Regulations (FARs) and the provisions of their contract. When cargo is loaded by government personnel, the contractor shall ensure cargo loaded is secure and in accordance with FARs.

1.6.3.2. Load Plan. The contractor shall be responsible for load planning, weight and balance, secure fastening, and any required special handling.

1.6.3.3. Civil Airlift Support Specialist (CASS). For passenger missions, a contractor representative shall be available in person or via telephone at all points at least 3 hours in advance of all schedule trip departures or actual arrivals, whichever is earlier. For cargo missions, CASS personnel shall be available at the originating location 4 hours prior to scheduled departure time for narrow body aircraft and 6 hours prior to scheduled departure time for wide body aircraft. At all enroute, turnaround, and terminating points, CASS shall be available at least 3 hours in advance of all scheduled trip departures or actual arrivals, whichever is earlier. This representative shall be responsible for providing necessary information and coordinating with government personnel, and shall have the authority to react to and effect necessary changes.

1.6.4. AMC. The normal support provided by HQ AMC through 618 Air and Space Operations Center (Tanker Airlift Control Center) AOC (TACC); Fixed, Enroute, or Mobile Global Air Mobility Support System (GAMSS) assets; and/or Contingency Response Groups (CRG)/Contingency Response Elements (CREs) still exists with activated CRAF assets. In addition, AMC’s CRAF Cell (HQ AMC/A3B) works to provide long and short-range international section and national segment mission oversight during CRAF activations.

1.6.5. Users of CRAF Airlift Assets. In addition to the roles and responsibilities listed in DTR 4500.9-R it is emphasized that the user MUST:
1) Load in accordance with the load breakdown provided by the contractor on AF Form 4080, Load/Sequence Breakdown Worksheet, or equivalent.

2) Provide to the contractor actual weights for all items transported in the cargo compartment. Actual, or interrogated weights (where currently calibrated scales are not available) for passengers will be provided to the contractor.
Chapter 2

LOAD PLANNING

2.1. General Principles. This pamphlet will NOT make you an AMC certified Load Planner, nor is it intended, in any way, to replace AMC’s Equipment Preparation and/or Airlift Planners Course. Some basic load planning concepts will be touched upon. The focus of this chapter, however, is to expand on the similarities and the differences of commercial airlift versus military airlift load planning. Sub-topics will be expanded upon in their own chapters.

2.2. Definitions and Meaning.

2.2.1. CRAF. The CRAF is a voluntary contractual program where civil carriers agree to augment military airlift during a crisis in exchange for peacetime defense business. During peacetime, regional contingencies, and major exercises, CRAF carriers voluntarily contract to fulfill personnel and cargo movement requirements. CRAF carriers are contracted daily to fly various categories of airlift, to include channel airlift, SAAMs, exercise support, contingency support, and charter airlift. This augmentation is crucial to all common-users since it allows USTRANSCOM to continue to meet routine scheduled and surge commitments simultaneously. When needed, carriers participating in the CRAF program can be activated in one of three stages with each stage providing greater airlift capacity. These stages include Stage I—Committed Expansion (Regional Crisis or Small-Scale Contingency); Stage II—Defense Airlift Emergency (Major Theater War); and Stage III—National Emergency (Multiple Theater Wars and National Mobilization). CRAF carriers must be a U.S. entity or citizen owning U.S. registered aircraft that are certificated under Federal Aviation Administration (FAA) FAR Part 121 rules. These aircraft are allocated by the DOT in accordance with DOD requirements and aircraft capabilities into segments, such as international (long-range, short-range, cargo, and passenger), national, and other segments as mutually agreed upon by the DOD and the DOT.

2.2.2. Long-Range International. The standard long range capability is 3,500NM for both passenger and cargo aircraft while carrying a productive payload. A productive payload is 75% of the aircraft’s maximum payload.

2.2.3. Historic Usage. Up to 93% of all passengers and approximately 40% of all cargo moved via CRAF during its Stage II activation for Operation DESERT STORM and its Stage I (passenger only) activation for Operation IRAQI FREEDOM. Furthermore, historical data has shown that CRAF typically operates at a sustainment average of 87% of the maximum allowable cabin load (ACL) listed in this pamphlet.

2.2.4. Meaning for Load Planning. While some, if not most carriers, are a part of the CRAF year in and year out, one cannot necessarily count on any one particular carrier’s fleet for a given movement plan. Also, a consideration is that carriers may offer different airframes to the CRAF or even update their fleet since their last usage.

2.2.5. Load Planning Factors. History has proven that the CRAF is a vital part of DOD’s airlift capability. However, the safe planning factor to use is 90% of the maximum ACLs listed until the Guaranteed ACL (GACL) for a given movement is known. This can be derived by referencing the carrier’s contract GACL.
2.3. Aircraft Safety Considerations. It must be remembered that most civilian aircraft and aircrews will not have defensive/protective equipment. The Craf Enabling Concept described in AMCI 10-402 allows for Craf assets to transit Intermediate Staging Bases (ISBs) before going into any particular area of responsibility, area of operations, or theater of operations. Even with additional protective measures and support issued at ISBs, Craf assets may still NOT be allowed to fly directly to a planned offload location, dependent on the threat level.

2.4. Loading Restrictions. See: Chapter 3 – DIMENSIONAL PLANNING FACTORS

2.5. Center of Balance Considerations. The carrier is responsible for load planning, weight and balance, secure fastening, and any required special handling. The carrier will ensure cargo loaded is secure and in accordance with FARs and individual aircraft CG limits. This applies even when cargo is loaded by government personnel. When an aircraft is overloaded, the carrier shall decide the number of passengers, weight, or articles that shall be carried. The passenger ACL will be reduced with the concurrence of the administrative contracting officer (ACO).

2.6. Ease of Onload/Ease of Offload Considerations. See: Chapter 4 – MATERIAL HANDLING EQUIPMENT (MHE)

2.7. Cargo Categories and Considerations. See: Chapter 5 – ROLLING STOCK / LOOSE CARGO CONSIDERATIONS and: Chapter 6 – PALLETIZED CARGO CONSIDERATIONS

2.7.1. Bulk. General cargo, typically loaded on 463L pallets (108 inches by 88 inches) or containers. Craf cargo aircraft will at a minimum, arrive at onload site with their main decks prepared for 463L pallets and lower lobes ready for bulk (floor loaded) cargo.

2.7.2. Oversize. Cargo exceeding the usable dimension of a 463L pallet loaded to the design height of 96 inches, but equal to or less than 1,000 inches in length, 117 inches in width, and 105 inches in height. This cargo is air transportable on most civilian contract cargo carriers, but dimensional compatibility must be checked.

2.7.3. Outsize. Exceeds oversize dimensions (over 1,000 inches long, 117 inches wide, and/or 105 inches high in any one dimension) and requires the use of a C-5 or C-17 aircraft or surface transportation. Exception: Dependent on the actual piece of cargo, certain series of B747 and/or AN-124 may be able to accept it.

2.7.4. Rolling Stock. Equipment that can be driven or rolled directly into the aircraft cargo compartment. Most civilian aircraft will not accept rolling stock. Those that do, will usually want it pre-loaded on a pallet sub-floor. Check individual addenda.

2.7.5. Special. Items requiring specialized planning/preparation and handling procedures, such as mail, satellites, hazardous cargo, or nuclear weapons. Check with individual Craf carrier representative (CASS) for detailed information regarding special cargo.

2.8. Hazardous Cargo (HAZMAT) Considerations. Airlift of military HAZMAT utilizing contract air carriers during Craf activation is authorized IAW Department of Transportation Special Permits (DOT-SP) 7573 and 9232, and is prepared IAW DTR 4500.9-R, Part III, App. J and App. BB, and AFMAN24-204(I), Attachment 23. However, if contract airlift is used for other than a national emergency, ensure hazards are prepared IAW 49 CFR 100-199. See AMCI10-402; Section 10M – “DOT Exemptions”, for detailed Craf HAZMAT procedures.

2.9. Passenger Considerations. See Chapter 7 – PASSENGER CONSIDERATIONS.
2.10. **Restraint Criteria.** Air Transportability Test Loading Activity (ATTLA) standards for restraint criteria are listed in Table 2.1. While these limits apply to securing loads onto USAF military cargo aircraft, they can be used as a guide for CRAF aircraft. NOTE: These are minimum levels of restraint. Individual carriers can require more than this, if deemed necessary.

**Table 2.1. Restraint Criteria.**

<table>
<thead>
<tr>
<th>Direction</th>
<th>Level</th>
<th>Input Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward (fwd) 1</td>
<td>3G</td>
<td>Hard landing or sudden deceleration</td>
</tr>
<tr>
<td>Aft or rear</td>
<td>1.5G</td>
<td>Sudden acceleration</td>
</tr>
<tr>
<td>Lateral (side)</td>
<td>1.5G</td>
<td>Skidding</td>
</tr>
<tr>
<td>Up (vertical)</td>
<td>2G</td>
<td>Extreme turbulence</td>
</tr>
<tr>
<td>Down 2</td>
<td>4.5G</td>
<td>Hard landing</td>
</tr>
</tbody>
</table>

1. If personnel are located in front of cargo, the cargo item(s) must be restrained to 9Gs forward.
2. Primary cargo must be restrained by cargo floor; secondary cargo must be restrained by primary cargo.

2.11. **Commercial Aircraft Ground Times.** TACC planners and controllers will ensure commercial contracted cargo mission ground times are be based on narrow body or wide body aircraft types as listed in Table 2.2 and commercial contracted passenger mission ground times are based on contracted allowable cabin load (ACL) as listed in Table 2.3.

2.11.1. Station Delay. When a commercial aircraft departs a station in delay, TACC/XOC controllers will contact the commercial carrier and USTC/TCAQ. The commercial carrier will provide a plan that attempts to return the mission back onto the originally scheduled times as allowed by follow-on arrivals, slot times, and mission needs. TACC/XOC controllers will ensure prior coordination with applicable agencies (Air Mobility Command Center, Command Post, Base Ops, Aerial Port, Etc...) is accomplished and appropriate deviation codes are accurately applied to all mission types.

**Table 2.2. CRAF Planning Ground Times (Cargo Aircraft)**

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Originating</th>
<th>Terminating Stations</th>
<th>Enroute Stations</th>
<th>Turn-around Stations</th>
<th>Exception L-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow-Body</td>
<td>2+00</td>
<td>2+00</td>
<td>2+00</td>
<td>2+30</td>
<td>1+00</td>
</tr>
<tr>
<td>Wide-Body</td>
<td>3+00</td>
<td>3+00</td>
<td>3+30</td>
<td>3+30</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Notes:**
1. When a Wide-Body aircraft terminates an active mission and originates to another mission, ground time is 3+30 hours.
2. When establishing schedules, TACC planners and commercial schedulers retain flexibility to determine actual ground times based on particular mission needs.
### Table 2.3. CRAF Planning Ground Times (Passenger Aircraft)

<table>
<thead>
<tr>
<th>Contracted ACL</th>
<th>Originating Missions</th>
<th>Terminating Missions</th>
<th>Enroute Missions</th>
<th>Turn-around Missions</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 or less</td>
<td>2+00</td>
<td>2+00</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>251 or more</td>
<td>3+00</td>
<td>3+00</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>170 or less (small aircraft)</td>
<td>N/A</td>
<td>N/A</td>
<td>1+30</td>
<td>2+00</td>
</tr>
<tr>
<td>171 – 260 (medium aircraft)</td>
<td>N/A</td>
<td>N/A</td>
<td>2+00</td>
<td>3+00</td>
</tr>
<tr>
<td>261 or more (large aircraft)</td>
<td>N/A</td>
<td>N/A</td>
<td>3+00</td>
<td>3+00</td>
</tr>
<tr>
<td>Mixed</td>
<td>2+00</td>
<td>2+00</td>
<td>2+00</td>
<td>2+00</td>
</tr>
</tbody>
</table>

**Notes:**
1. When a Wide Body Aircraft terminates an active mission and originates to another mission, ground time is 3+30 hours.
2. When establishing schedules, TACC planners and commercial schedulers retain flexibility to determine actual ground times based on particular mission needs.
Chapter 3

DIMENSIONAL PLANNING FACTORS

3.1. Types. As previously discussed, civilian airframes vary widely from carrier to carrier and quite often, within a carrier’s own fleet. It is not uncommon that notable variations occur between the same type, model, and series of civil aircraft, depending upon the needs of the carrier. Therefore, use the information in this publication for general planning purposes only. Specific information (such as the number of passenger seats) may not be known until a specific aircraft arrives at the onload station.

3.1.1. Body Types. Generally, there are two basic body types – narrow and wide-body.

3.1.1.1. Narrow-body. Narrow-body aircraft have a cabin diameter of approximately 10-13 ft. across and two rows of passenger seats (2-6 abreast) with a single center aisle.

3.1.1.2. Wide-body. Wide-body aircraft have a wider cabin diameter (about 16-20 ft. across), have twin aisles for passengers (seating up to 11 abreast) and are more often used to ship cargo than narrow-body aircraft.

3.1.2. Compartments.

3.1.2.1. Types. The FAA defines the various compartments in an aircraft from Class A-E based on ventilation, fire detection/protection, and accessibility. When planning for loading, most compartments are simply referred to as: passenger, cargo, bulk, and baggage compartments. Furthermore, geographic locations are also attached (e.g., forward lower cargo compartment, main deck). The words “deck” and “lobe” are virtually synonymous with compartment.

3.1.2.2. Dimensions. Most civilian aircraft do NOT present a uniform loading dimension throughout each compartment. Expect narrowing/tapering along any compartment shape. Potentially, cargo needs to be contoured to fit into a given compartment, so cargo/pallet buildup and placement needs to account for this.

3.1.3. Passenger Compartment Categories. There are primarily three categories that are referred to: passenger, freight, and COMBI. While all three categories can ship both cargo and passengers, the main difference is in how the main deck/passenger compartment is configured. For example, if the main deck is configured in COMBI mode, it means it will hold both cargo and passengers. NOTE: The COMBI mode will have the most variations in configuration.

3.2. Carrier Information. The carrier shall provide the following minimum information to 618 AOC (TACC) no later than 24 hours prior to departure time: type aircraft; tail number; ACL in passenger seats and pounds for all scheduled segments; cube allowable in the belly compartments and belly weight by compartment.

3.3. Manufacturer Specifications. The dimensional information presented in these pamphlets has been derived from the manufacturers’ factory specifications. While a relatively good basic starting point, all dimensions should be verified, since many civilian airframes have been modified. Door opening dimensions, cargo compartment/lobe height, length, width, and seating are subject to change with each airframe.
3.4. **Loading time.** The clearance available during loading influences both the amount of time necessary to load an item and the skill level required of the loading crew. In general, whenever minimum clearance between the item and the aircraft structure exists, ground maneuvering and flight operations are influenced. When the dimensions listed in the AMCPAM 24-2 Series become an issue with the dimensional compatibility of an item of cargo, the loading times listed in Table 2.2 should be questioned.

3.5. **Unauthorized Dimension Restrictions.** Prior to positioning the aircraft for flight, the carrier shall remove all unauthorized cube restrictions from the cargo compartment. As applicable, aircraft must be equipped with cargo sill guards when on/offloading cargo.

3.6. **Permissible Reductions of ACL.** Carriers are allowed 3% of available ACL, by weight, for necessary self-support.

3.7. **Air Transport Certification Requirement.** Just because an item is shipped via CRAF assets, it does NOT exempt it from being certified for air transport with ATTLA if it is deemed an “air transportability problem item” by exceeding ANY of the following parameters. Contact ATTLA at attla@wpafb.af.mil for further guidance.

**Table 3.1. ATTLA Certification Parameters.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length: 20 ft. (240 in)</td>
<td>Load Concentration: 1,600 lbs. per linear ft.</td>
</tr>
<tr>
<td>Width: 8 ft. (96 in)</td>
<td>Floor contact pressure: 50 psi</td>
</tr>
<tr>
<td>Height: 8 ft. (96 in)</td>
<td>Axle loads: 5,000 lbs.</td>
</tr>
<tr>
<td>Weight: 10,000 lbs.</td>
<td>Wheel loads: 2,500 lbs.</td>
</tr>
<tr>
<td>Other: Any item that requires special equipment or procedures for loading.</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 4

MATERIAL HANDLING EQUIPMENT (MHE)

4.1. Definitions.

4.1.1. Global Air Mobility Support System (GAMSS). A key element of air mobility and provides responsive, worldwide support to airlift and air refueling operations. The three core functions provided through the GAMSS are: command and control, maintenance, and aerial port. GAMSS is normally provided by AMC at Fixed, Enroute, and Mobile locations.

4.1.2. MHE. Describes equipment used in packaging, handling, or transporting cargo in preparation for air shipment. Although this allows for a wide variety and can be a catch-all phrase, this chapter focuses mainly on the types that will enable on/offloading of cargo and/or passengers onto CRAF aircraft.

4.2. Responsibilities. The finest movement plans in the world have often been delayed due to lack of proper MHE and poor coordination of GAMSS elements. Although the following describes basic responsibilities for MHE coordination, taking the extra precaution to personally ensure all necessary MHE requests are accomplished will make both on/offloads easier.

4.2.1. AMC. CRAF logistics support during activations will be coordinated with the AMC Crisis Action Team (CAT) and will be monitored by TCAQ and HQ AMC/A3B. 618 AOC (TACC) will be responsible for assuring availability of adequate cargo and passenger MHE, to support planned workload at all on-load and off-load locations. During periods of CRAF activation, AMC CAT will position any CRAF carrier-specific MHE that exceeds the contractor capability to position. Outside of times of activation (i.e., normal, commercial augmentation airlift support), positioning of carrier-specific MHE remains the responsibility of the carrier.

4.2.2. Military Host/Supporting Installation. The host/supporting installation will (1) provide Arrival/Departure Airfield Control Group (A/DACG) and support deploying mobility forces as requested (i.e., MHE, container handling equipment, manpower, fuel, or staging facilities), and (2) be the primary provider of mobility forces and MHE support when the aerial port/air terminal is the host.

4.2.2.1. Use of Government-furnished MHE. Government-furnished MHE will be used at military on/offload airfields whenever possible.

4.2.3. Individual CRAF Carrier (Contractor).

4.2.3.1. Use of Existing Carrier Assets. To the maximum extent possible, logistics support of CRAF aircraft will be provided by the participating carrier and obtained from existing carrier assets. Shortages in such support may be supplemented by carrier contract and/or arrangements with other sources. If CRAF carriers cannot support themselves, requests for assistance should be forwarded to HQ AMC/A3B.

4.2.3.2. Additional Tiedown Equipment. When additional tiedown equipment is necessary to secure the loaded pallet to the aircraft, and prior coordination is made, the contractor shall furnish it.
4.2.3.3. Commercial Pallets. In some cases, military necessity may require hand loading of cargo. When required, contractors shall furnish commercial pallets to be used as a subfloor for the lower lobes. Notification will be provided by the ACO.

4.2.3.4. Special MHE. Special handling equipment (which is not commonly used on military aircraft), such as tow bars, may not be available at military installations and must therefore, be furnished by the contractor. Contractor shall also furnish personnel to operate and maintain such equipment. Positioning of contractor MHE will normally be the contractor's responsibility.

4.2.4. Users of CRAF Airlift Assets.

4.2.4.1. User-Furnished Cargo Equipment. Cargo handling equipment, including 463L pallets and associated cargo restraining nets and tiedown equipment will be furnished by military customers being moved.

4.2.4.2. User-Furnished Services. The following will normally be provided by the user of CRAF assets whenever possible, unless on/offload locations have GAMSS/civilian aerial port assets to handle the movement:
- Passenger processing, manifesting, and documenting
- Baggage handling (weigh, tag, load and unload)
- Cargo manifesting and on/offloading

4.3. CRAF MHE Compatibility. In the past, most military MHE was designed to be specifically used on military airlift assets; however, this is no longer the case. Even still, some models of MHE may or may not be suitable for use on CRAF assets. See Attachment 2 and Attachment 3 for a guide to assist in planning for MHE needs with particular airframes.

4.4. MHE Characteristics. A detailed description of various MHE types and characteristics can be found in AMCI 10-202V4, CL-1.

4.5. Conclusion. AMC’s inventory of MHE is quite large; however, most MHE is dedicated to AMC’s fixed or enroute aerial ports for daily operations. If the need arises to reposition MHE to on/offload locations it will be expensive, time consuming, and most likely occupy a tremendous amount of available military airlift cargo space. Therefore, the user of CRAF assets needs to provide as much MHE from local sources as possible. By the same token, it must be remembered to plan and coordinate for the use of MHE at deployed locations. Cargo that cannot be removed and transported from the airplane after it arrives is of little value. If MHE support is required, contact an affiliated ALCF/CRE/CRG unit or AMC CAT as early as possible to arrange for assistance and coordination.
Chapter 5

ROLLING STOCK / LOOSE CARGO CONSIDERATIONS

5.1. Floor Loading Overview. The non-structural nature of many commercial aircraft floor surfaces requires cargo to be palletized or loaded upon a palletized or wood-shored subfloor. The air carrier’s procedures should address the airplane’s floor load limits (area load or linear-running load limits) if the air carrier allows cargo to be loaded directly on the airplane’s floor. Wheeled cargo/loose cargo can be loaded directly aboard the aircraft when a subfloor is installed. This subfloor can be either: a 463L pallet (HCU-6/E), a commercial pallet, or other type shoring. Normally, the 463L (HCU-6/E) pallet is used in military airlift operations.

5.1.1. Commercial Pallets. In some cases during CRAF activation, military necessity may require hand loading of passenger baggage on commercial aircraft. Should the need arise contractors shall be required to furnish commercial pallets to be used as a subfloor for their lower decks/lobes. Notification will be provided by the Contracting Officer.

5.1.2. Shoring. Shoring is a material used to distribute a load over a larger area. Thus it is possible to carry a load with a higher weight concentration than normally would be allowed. Shoring will only increase the area over which a load is distributed to whatever area is obtained by extending a plane drawn downward and outward, at an angle of 45°, until it intersects the surface on which shoring rests. Both plywood and dimension lumber are commonly used for shoring purposes. Shoring, when used as a subfloor, must consist of wood at least thick enough to support the load distribution, but generally a minimum of ¾ inch is used. The air carrier’s procedures should address how to distribute (shore) the weight of cargo having a load bearing weight greater than a floor load limit. The user of CRAF airlift assets will provide shoring as required.

5.2. Actual Weights. All items transported in the cargo compartment of a commercial aircraft will be weighed and actual (not planned) weights will be provided to the contractor.

5.3. Bulk vs. Loose/Floor Loaded Cargo. It must be noted that the military definition of bulk cargo (see paragraph 2.7.1) differs from what the FAA defines it as. According to FAA AC 120-85, bulk cargo is generally defined the same as what the military would term loose/floor loaded cargo. This distinction is important in that a civilian carrier cargo compartment will be categorized as either a “bulk load” or “non-bulk load” compartment. There may be certain cargo compartments that can ONLY accept loose/floor loaded cargo.

5.3.1. Bulk Load Compartment. A compartment that has provisions that prevent bulk cargo from: (1) shifting and damaging airplane systems/structures, and (2) shifting to the extent that the airplane CG exceeds the certified limits to include the requirement that the construction of the airplane ensures that unrestrained cargo, when subjected to the flight, ground, and landing forces, cannot damage airplane systems/structure by impact.

5.3.2. Non-bulk Load Compartment. A compartment that protects an airplane’s systems and structures by a cargo restraint system. The load restraints will ensure that the cargo structural loads are only applied to the airplane through the load-airplane interface of the cargo restraint system. The cargo restraint system may include barriers, unit load devices (ULDs), nets, straps, chains, tiedowns, and floor locks.
Chapter 6

PALLETIZED CARGO CONSIDERATIONS

6.1. Overview. This chapter will discuss any unitized load, which has been assembled and packaged in such a way as to move from source to destination (or as far forward as practical) without the need to break down or reassemble it for air transport. It is concerned with both containerized and palletized loads meant to be secured by an aircraft rail and locking system.

6.2. Military 463L Cargo Handling System. 463L is the common designation for a family of air cargo handling equipment. The 463L system consists of separate, but interdependent, equipment families including: air terminal Mechanized Material Handling Systems (MMHS), on-board aircraft cargo handling systems, ground handling equipment, pallets, and nets.

6.2.1. 463L Pallet Use. Normally, the HCU-6/E pallet is used in military airlift operations; however, CONEX and ISU containers with their own or incorporated integral base to lock into a 463L rail system can also be used. CRAF aircraft shall be equipped with mechanized roller systems or rail systems that are compatible with 463L configured pallets and equipment.

6.3. Civilian Cargo Handling System. The theme of this AMC pamphlet is paraphrased here. Civilian cargo handling systems are not standardized and can vary widely, even within each carrier’s fleet. However, even though each carrier is given wide latitude on developing a cargo handling system, most will use some form of restraint system designed for ULDs.

6.3.1. Unit Load Device (ULD). A ULD is any type of freight container, aircraft container, or aircraft pallet with a net that is capable of being locked into the aircraft cargo restraint system. A ULD may or may not be certified by government airworthiness authorities.

6.3.1.1. Certified ULD. Considered as a removable aircraft hold, structurally capable of fully restraining the load contained within, and/or providing adequate protection to the aircraft systems and structure.

6.3.1.2. Non-certified ULD. Not considered as a removable aircraft hold, and can only be loaded into aircraft holds that are compartment restraint certified and pursuant to the aircraft’s weight and balance manual. For containers, the base plate must be structurally attached to and an integral part of the assembly and the ULD must be capable of fully containing or restraining the cargo or baggage contained within.

6.3.1.3. ULD Types. The two ULD types are pallets and containers. ULD pallets are rugged sheets of aluminum with rims to lock onto cargo net lugs. ULD containers (a.k.a. “cans” or “pods”) are closed containers made of aluminum or a combination of aluminum frame and fabric walls/door and may be contoured to fit a specific compartment’s profile.

6.4. Meaning for Load Planning. Although the military uses 463L pallets/containers for movements, be aware that most CRAF aircraft pallet capacities listed herein are measured by how many IATA code PAG- / P1P- type LD7s (88 inches × 125 inches) that can be stored. LD7s also inexplicably come in two different floor dimensions (96 inches × 125 inches as well as 88 inches × 125 inches).
6.5. Actual Weights. All items transported in the cargo compartment of a commercial aircraft will be weighed and actual (not planned) weights will be provided to the contractor.
Chapter 7

PASSENGER CONSIDERATIONS

7.1. Overview. Passenger planning for CRAF airlift assets is, for the most part, much easier than cargo planning. Passengers on CRAF airlift will be planned for and processed much the same as on military airlift, with only the major differences listed below.

7.2. Passenger Weights. The following weights and procedures apply to individuals transported on AMC-chartered commercial aircraft as per DTR 4500.9-R, Part III, App. V. Actual weights will always be used when manifesting passengers on commercial aircraft.

7.2.1. Planning Weights. The weights in Table 7.1 are for planning purposes only. No standard body weights will be used for troops transported on commercial aircraft.

Table 7.1. Planning Weights.

<table>
<thead>
<tr>
<th>Troop Type</th>
<th>Equipment</th>
<th>Planning Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-combatant equipped</td>
<td>175 lbs.</td>
<td></td>
</tr>
<tr>
<td>Combat-equipped</td>
<td>carry-on bag only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>210 lbs.</td>
<td></td>
</tr>
<tr>
<td>Combat-equipped</td>
<td>web gear weapon</td>
<td></td>
</tr>
<tr>
<td></td>
<td>210 lbs.</td>
<td></td>
</tr>
<tr>
<td>Combat-equipped</td>
<td>carry-on baggage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>web gear weapon</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230 lbs.</td>
<td></td>
</tr>
</tbody>
</table>

7.2.2. Actual Weights. Use actual scaled weights of individuals with uniform, boots, helmet, weapon, web gear, and hand-carried bag.

7.2.3. Interrogated Weights. If scales are not available, interrogated weights of individuals can be used. After asking each individual their weight, use the following additive item weights in Table 7.2 as necessary to determine total weight of the traveler.

Table 7.2. Additive Interrogated Weights.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Use for Interrogated Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boots</td>
<td>5 lbs.</td>
</tr>
<tr>
<td>Helmet</td>
<td>5 lbs.</td>
</tr>
<tr>
<td>Uniform</td>
<td>5 lbs.</td>
</tr>
<tr>
<td>Web gear</td>
<td>12 lbs.</td>
</tr>
<tr>
<td>Weapon</td>
<td>10 lbs.</td>
</tr>
<tr>
<td>Hand-carried bag</td>
<td>20 lbs.</td>
</tr>
</tbody>
</table>

7.3. Seating Charts. The seating charts listed in the accompanying volumes for individual airframes are meant for standard planning. A variety of seating configurations are possible, even without modifications to the seat rails. The exact seating number will be given when a particular airframe is assigned.

7.4. Seating Troops. Depending on the status of CRAF airlift (e.g., contract, charter, CRAF activation), as well as the point of embarkation (i.e., military or civilian airfield), seats may or may not be assigned by use of boarding passes. The troop commander should be prepared, in addition to their normal duties, to assign seats.
7.5. TSA Requirements. On or offload at a civilian airfield may require troops/passengers to follow the guidelines for travel by the Transportation Security Administration (TSA). Carry-on restrictions apply to all passengers required to process through the AMC passenger terminal or equivalent when at a non-AMC location. For most recent TSA travel guidelines, go to http://www.tsa.gov/traveler-information.


7.6.2. General Guidance. Although users of CRAF airlift must follow the appropriate procedures listed in the publication above, the following is meant to provide additional guidance in shipping individual weapons.

7.6.2.1. Weapons. The weapons talked about are individual, government-issue weapons. Crew-serviced weapons (e.g., M-240, 50 cal) must be transported as baggage or cargo.

7.6.2.2. Options. The only two options available for shipping individual weapons are:

1. Stowing inoperable, unloaded firearms with troops in the passenger compartment and shipping ammunition as baggage or cargo; or

2. Shipping assembled, unloaded, and containerized firearms and ammunition as baggage or cargo. Barring the highly unlikely event of using a CRAF airlift asset to ship troops directly to an area of immediate engagement of enemy forces, there is NO option of having troops in the passenger compartment with their basic combat load.

7.6.2.3. Use. Option (1) may only be exercised when the total cabin load of the aircraft consists exclusively of DOD-sponsored forces in support of training exercises or contingency operations, and when authorized in the operations plan or mission directive.

7.6.2.4. Authority. The authority for allowing troops to travel with inoperable, unloaded firearms in the passenger compartment will come from the Combatant Commander, based on needs of the movement. The troop/movement commander does not make this determination solely on the basis of ease of loading. Furthermore, advance coordination and approval with the contract carrier, civilian airfields and facilities, and individual aircraft commanders must all be obtained.

7.7. Loading of Baggage. In addition to following the guidance in Chapter 5, the guidance provided below is meant to aid in planning how to load baggage on an all-passenger configured aircraft.

7.7.1. Loading of Passenger Baggage. There are at least four different methods for the loading of baggage into civilian aircraft. They include commercial baggage containers, tri-wall containers, bulk loading by hand, and palletizing.

7.7.1.1. Commercial Baggage Containers. Baggage containers normally are not the most desirable for contingency deployments. The use of commercial baggage containers normally requires that the loading of bags be delayed until the aircraft arrives at the
onload location and may require specialized MHE be brought in to load the containers. However, in the event that commercial baggage containers are used, carriers will furnish the appropriate type.

7.7.1.2. Tri-Wall Containers. Tri-wall containers are essentially pre-built boxes that can be used as baggage containers. These are normally available through transportation facilities on military installations. Loading may be accomplished using a forklift or K-loader. For ease of handling, use the smallest tri-wall container available, with consideration for size of contents and shape of the compartment it will be loaded in.

7.7.1.3. Loose (Bulk) Loading by Hand. Bulk-loading baggage by hand can be an efficient use of available personnel and equipment under a contingency situation. Hand-loading requires minimal MHE. Hand-loading also permits the weighing and loading of bags onto flatbed trucks or similar type vehicle prior to aircraft arrival.

7.7.1.4. Palletizing. The use of 463L pallets (HCU-6/E) as a baggage pallet on civil aircraft is possible, but is dependent on type aircraft and which compartment will be used for loading.

7.7.2. Assumptions. All four of these methods assume that normal loading is done by the military at noncommercial fields and that loading teams are readily available. It also assumes that in some instances passengers/troops will help or be the loading teams. When using any vehicle for this purpose, remove the rear and/or side panels prior to the on/offloading the truck at the aircraft and pre-position a chock before backing to prevent vehicle from striking the aircraft fuselage. With any of these methods, prior coordination is essential to a smooth loading operation.

SCOTT M. HANSON, Maj Gen, USAF
Director of Operations
Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

Department of Defense/Unified Combatant Commands

DTR 4500.9-R, Defense Transportation Regulation – Part III Mobility, July 2011
DTR 4500.9-R, Appendix K – Hazardous Materials (HAZMAT) Special Permits (SP), July 2011
DTR 4500.9-R, Appendix V – Aircraft Load Planning and Documentation, July 2011

JP 3-17, Air Mobility Operations, 30 September 2013

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AMC Affiliation Workbook 36-101 Volume II, Airlift Planner’s Course

Other Agencies

FAA, Order 5300.7, Standard Naming Convention for Aircraft Landing Gear Configurations, 06 October 2005
ATTLA, MIL-HDBK-1791, Designing for Internal Aerial Delivery in Fixed Wing Aircraft, 14 February 1997
IATA, ULD Technical Manual (ULD)
Airbus, 198 Van Buren Street Suite 300 Herndon, VA 20170
Boeing, P.O. Box 3707 Seattle, Washington 98124

Prescribed Forms

No forms or IMT’s prescribed by this publication

Adopted Forms

AF Form 847, Recommendation for Change of Publication
DD Form 2130-5, DC 10-10/30CF Load Plan
DD Form 2130-8, DC 8-50 Series F/CF Load Plan
DD Form 2130-9, DC 8-61/71-63/73F/CF Load Plan
DD Form 2130-10, DC 8-62CF Load Plan
DD Form 2130-11, B707-300C Load Plan
DD Form 2130-12, B747-100F/200C/200F Load Plan
DD Form 2130C, Aircraft Load Plan Continuation

Abbreviations and Acronyms
A/DACG—Arrival/Departure Airfield Control Group
A/R—Aerial Refueling
A3—Directorate of Operations/HQ AMC
A3B—DOD Commercial Airlift Division/HQ AMC
A3BA—DOD Analysis & Automation Branch/HQ AMC
A3BC—DOD Civil Reserve Air Fleet Branch/HQ AMC
A3BS—DOD Surveillance & Evaluations Branch/HQ AMC
A4—Directorate of Logistics/HQ AMC
A4M—Maintenance Division/HQ AMC
A4TC—Cargo & Traffic Management Policy Branch/HQ AMC
A4TP—Passenger Policy/HQ AMC
AA&E—Arms, Ammunition, & Explosives
AACG—Arrival Airfield Control Group
AALPS—Automated Air Load Planning System
AB—Air Base
ABC—Aft Bulk Compartment
ABO—Air Base Operations
ACA—Airlift Clearance Authority
ACA—Airspace Control Authority
AC—Aircraft Commander
ACAS—Air Carrier Analysis Support System
ACC—Air Combat Command
ACL—Allowable Cabin Load
ACM—Additional Crewmember
ACO—Administrative Contracting Officer
ACO—Airspace Control Order
ADCON—Administrative Control
ADUSD (TP)—Assistant Deputy Under Secretary of Defense for Transportation Policy
ADVON—Advanced Team
AEF—Air and Space Expeditionary Force
AEG—Air Expeditionary Group
AETF—Air and Space Expeditionary Task Force
AEW—Air Expeditionary Wing
AFCAT—Air Force Catalog
AFCC—Air Force Component Commander
AFDD—Air Force Doctrine Document
AFDIR—Air Force Directory
AFH—Air Force Handbook
AFI—Air Force Instruction
AFIND—Air Force Index
AFMAN—Air Force Manual
AFMD—Air Force Mission Directive
AFOSH—Air Force Occupational Safety & Health
AFPAM—Air Force Pamphlet
AFPD—Air Force Policy Directive
AFPM—Air Force Policy Memorandums
AFRC—Air Force Reserve Command
AFRP—Air Force Recurring Periodical
AFSC—Air Force Specialty Code
AFSSI—Air Force Systems Security Instructions
AFSSM—Air Force Systems Security Memorandum
AFTN—Aeronautical Fixed Telecommunications Network
AFWA—Air Force Weather Agency
AGE—Aerospace Ground Equipment
AGL—Above Ground Level
AGW—Allowable Gross Weight
AHA—Alert Holding Area
ALCF—Airlift Control Flight
ALCT—Airlift Control Team
AMC—Air Mobility Command
AMC/CC—Commander, Air Mobility Command
AMCALT—Air Mobility Command Alternate Headquarters
AMCH—AMC Handbook
AMCI—AMC Instruction
AMCMAN—AMC Manual
AMCMD—AMC Mission Directive
AMCOS—Air Mobility Combat Operations Staff
AMCPAM—AMC Pamphlet
AMCPD—AMC Policy Directive
AMCVA—AMC Visual Aid
AMD—Air Mobility Division
AMLO—Air Mobility Liaison Officer
AMOS—Air Mobility Operations Squadron
AMT—Air Mobility Tasking
ANG—Air National Guard
AO—Area of Operations
AOC—Air and Space Operations Center
AOR—Area of Responsibility
APC—Armored Personnel Carrier
APOD—Aerial Port of Debarkation
APOE—Aerial Port of Embarkation
APS—Aerial Port Squadron
ARC—Air Reserve Component
ARCT—Air Refueling Control Team
AS—Airlift Squadron
ASD—Aeronautical Systems Division
ASRR—Airfield Suitability and Restrictions Report
AST—Airfield Survey Team
ATA—Air Transport Association
ATACC—Alternate Tanker Airlift Control Center
AT—Assessment Team
ATC—Air Traffic Control
ATO—Air Tasking Order
ATOC—Air Terminal Operations Center
ATSG—Air Transportation Standards Guide
ATT—Affiliation Training Team
ATTLA—Air Transportability Test Loading Agency
BL—Bill of Lading
BL—Butt Line
C/B—Center of Balance
C2—Command and Control
C2IPS—C2 Information Processing System
C3—Command, Control, and Communications
C4I—Command, Control, Communications, Computers, and Intelligence
C4S—Command, Control, Communications, Computer Systems
CAM—Commercial Airlift Movement
CAMO—Contract Airlift Management Office
CAOC—Combined Air Operations Center
CARB—Commercial Airlift Review Board
CASS—Civil Airlift Support Specialist
CASF—Contingency Aeromedical Staging Facility
CAT—Crisis Action Team
CAT—D—Crisis Action Team Director
CBRNE—Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive
CCATT—Critical Care Air Transport Team
CC—Commander
CCDR—Combatant Commander
CDDOC—Coalition Deployment Distribution Operations Center
CF/F—Convertible Freighter or Freighter
CFACC—Coalition Force Air & Space Component Commander
CFR—Code of Federal Regulations
CG—Center of Gravity
CHOP—Change of Operation Control
CJTF—Commander, Joint Task Force
CL—Center Line
CLL—Center Lower Lobe
CLPT—Contingency Load Planning Team
CLS—Cargo Loading System
CMM—Component Maintenance Manual
COA—Course of Action
COCOM—Combatant Command
COMAFFOR—Commander of Air Force Forces
COMBI—Combination
COMM—Commercial
COMPT—Compartment (same as lobe)
COMSEC—Communications Security
CONEX—Container Express
CONF—Configuration
CONUS—Continental United States
CP—Command Post
CRAF—Civil Reserve Air Fleet
CRC—Control and Reporting Center
CRE—Contingency Response Element
CRG—Contingency Response Group
CRT—Contingency Response Team
CRW—Contingency Response Wing
CST—Contingency Support Team
CU FT—Cubic Feet/Foot (FT3)
D#—Distance One, Two, Three, etc…
DACG—Departure Airfield Control Group
DAMA—Demand Assigned Multiple Access
DCAPES—Deliberate Crisis Action Planning and Execution Segment
DCC—Deployment Control Center
DCS—Defense Courier Service
DDOC—Deployment Distribution Operations Center
DDT—Double Dual Tandem Type Landing Gear (B-747, etc.)
DEL—Deployment Equipment List
DHS—Department of Homeland Security
DIRMOBFOR—Air—Director of Air Mobility Forces
DIST—Distance
DODD—Department of Defense Directive
DOD—Department of Defense
DODI—Department of Defense Instruction
DO—Director of Operations
DOT—Department of Transportation
DOT—SP—Department of Transportation Special Permit
DPA—Defense Production Act
DSN—Defense Switched Network
DSS—Defense Security Service
DSSOCC—Defense Security Service Facility Clearance Office
DTR—Defense Transportation Regulation
DV—Distinguished Visitor
EAS—Expeditionary Airlift Squadron
EMTF—Expeditionary Mobility Task Force
EOD—Explosives Ordinance Disposal
EPC—Equipment Preparation Course
ERO—Engine Running Onload/Offload
ESCAT—Emergency Security Control of Air Traffic
EST—Estimate
ETA—Estimated Time of Arrival
ETB—Estimated Time Aircraft Will be on Blocks
ETD—Estimated Time of Departure
ETIC—Estimated Time in Commission
FAA—Federal Aviation Administration
FARs—Federal Aviation Regulations
FAW—Front Axle Weight
FCG—Foreign Clearance Guide
FEMA—Federal Emergency Management Agency
FFE—Front Forward Edge
FIR—Flight Information Region
FLIP—Flight Information Publication
FLL—Forward Lower Lobe
FM—Field Manual
FOA—Field Operating Agency
FOB—Forward Operating Base
FOH—Front Overhang
FOIA—Freedom of Information Act
FOUO—For Official Use Only
FS—Fuselage Station
FT—Feet/Foot
FT3—Cubic Feet/Foot (CU FT)
FWD—Forward
FY—Fiscal Year
GACL—Guaranteed Allowable Cabin (Or Cargo) Load
GAL—Gallon(s)
GAMSS—Global Air Mobility Support System
GATES—Global Air Transportation Execution System
GCCS—Global Command and Control System
GCCS—J—Global Command and Control System – Joint
GDSS—Global Decision Support System
GFM—Global Freight Management System
GLO—Ground Liaison Officer
GMT—Greenwich Mean Time
GPMRC—Global Patient Movement Requirements Center
GSS—Global Support Squadron
GTN—Global Transportation Network
GW—Gross Weight
GWT—Gross Weight
HA—Humanitarian Assistance
HAZDEC—Hazardous Declaration
HAZMAT—Hazardous Materials
HGT—Height
HN—Host Nation
HQ—Headquarters
HR—Hazard Report
HT—Height
HUMRO—Humanitarian Relief Operation
HW—Hazardous Waste
IATA—International Air Transportation Association
IAW—In Accordance With
IAW—Intermediate Axle Weight
ICAO—International Civil Aviation Organization
ID—Identification Number
IG—Inspector General
IN—Inches
IPL—Illustrated Part List
ISB—Intermediate Staging Base
ISR—Intelligence, Surveillance, & Reconnaissance
ISU—Internal Slingable Unit
ITV—In-Transit Visibility
JAOC—Joint Air Operations Center
JAOP—Joint Air Operations Plan
JCN—Job Control Number
JCS—Joint Chiefs of Staff
JDDOC—Joint Deployment Distribution Operations Center
JFACC—Joint Force Air Component Commander
JFC—Joint Force Commander
JI—Joint Inspection
JMC—Joint Movement Center
JOA—Joint Operation Area
JOSAC—Joint Operational Support Airlift Center
JP—Joint Publication
JRTC—Joint Readiness Training Center
JSCP—Joint Strategic Capabilities Plan
JSPS—Joint Strategic Planning System
JTAV—Joint Total Asset Visibility
JTF—Joint Task Force
JTTTP—Joint Tactics, Techniques, and Procedures
K—1000 Pounds
LAT—Lateral
LBL—Left Butt Line
LBS—Pounds
LCN—Load Classification Number
LMSR—Large Medium Speed Roll-On/Roll-Off
LOAC—Law of Armed Conflict
LOGAIS—Logistics Automated Information System
LOGREQ—Logistics Requirements
LONG—Longitude
LOSS—Liquid Oxygen Subsystem
LOX—Liquid Oxygen
LRC—Logistics Readiness Center
MAC—Mean Aerodynamic Chord
MAF—Mobility Air Force
MAJCOM—Major Command
MASSF—Mobile Aeromedical Staging Facility
MAX—Maximum
MCC—Movement Control Center
MCD—Medical Crew Director
MEGP—Mission Essential Ground Personnel
MGW—Maximum Gross Weight
MHE—Material Handling Equipment
MLW—Maximum Design Landing Weight
MLW—Maximum Landing Weight
MOA—Memorandum of Agreement
MMHS—Mechanized Material Handling System
MOBREP—Mobilization Representative
MOG—Maximum On Ground
MOM—Moment
MOOTW—Military Operations Other Than War
MOS—Medical Oxygen Subsystem
MOU—Memorandum ofUnderstanding
MRT—Maintenance Recovery Team
MRW—Maximum Design Ramp Weight
MSC—Mission Support Cell
MTOW—Maximum Take Off Weight
MTW—Maximum Design Taxi Weight
MZFW—Maximum Design Zero Fuel Weight
NAF—Numbered Air Force
NCOIC—Noncommissioned Officer in Charge
NCO—Noncommissioned Officer
NEO—Noncombatant Evacuation Operations
NEW—Net Explosive Weight
NGO—Non-Governmental Organization
NMC—Non-Mission Capable
NM—Nautical Mile (Statute Mile x 1.15)
NOTAM—Notices To Airmen
NSN—National Stock Number
O&M—Operations & Maintenance
OCONUS—Outside Continental United States
OEW—Operating Empty Weight
OIC—Officer in Charge
OI—Operating Instruction
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>OL</td>
<td>Operating Location</td>
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<tr>
<td>OPCON</td>
<td>Operational Control</td>
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<tr>
<td>OPLAN</td>
<td>Operation Plan</td>
</tr>
<tr>
<td>OPLIFT</td>
<td>Opportune Lift</td>
</tr>
<tr>
<td>OPORD</td>
<td>Operations Order</td>
</tr>
<tr>
<td>OPREP</td>
<td>Operations Report</td>
</tr>
<tr>
<td>OPR</td>
<td>Office of Primary Responsibility</td>
</tr>
<tr>
<td>OPSEC</td>
<td>Operations Security</td>
</tr>
<tr>
<td>ORM</td>
<td>Operational Risk Management</td>
</tr>
<tr>
<td>OSA</td>
<td>Operational Support Airlift</td>
</tr>
<tr>
<td>OSD</td>
<td>Office of the Secretary of Defense</td>
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<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration/Act</td>
</tr>
<tr>
<td>PAX</td>
<td>Passenger(s)</td>
</tr>
<tr>
<td>PDO</td>
<td>Publications Distribution Office</td>
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<tr>
<td>PERSCO</td>
<td>Personnel Support for Contingency Operations</td>
</tr>
<tr>
<td>PID</td>
<td>Plan Identification</td>
</tr>
<tr>
<td>PIN</td>
<td>Personnel Increment Number</td>
</tr>
<tr>
<td>PLF</td>
<td>Pounds per Linear Foot</td>
</tr>
<tr>
<td>PLI</td>
<td>Pounds per Linear Inch</td>
</tr>
<tr>
<td>PLS</td>
<td>Patient Loading System</td>
</tr>
<tr>
<td>PMEL</td>
<td>Precision Measurement Equipment Laboratory</td>
</tr>
<tr>
<td>PMI</td>
<td>Preventive Maintenance Inspection</td>
</tr>
<tr>
<td>PMRC</td>
<td>Patient Movement Requirement Center</td>
</tr>
<tr>
<td>PMR</td>
<td>Patient Movement Requirement</td>
</tr>
<tr>
<td>POC</td>
<td>Point of Contact</td>
</tr>
<tr>
<td>POD</td>
<td>Port of Debarkation</td>
</tr>
<tr>
<td>POE</td>
<td>Port of Embarkation</td>
</tr>
<tr>
<td>POL</td>
<td>Petroleum, Oils, &amp; Lubricants</td>
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<tr>
<td>POP</td>
<td>Performance Oriented Packaging</td>
</tr>
<tr>
<td>PP</td>
<td>Pallet Position</td>
</tr>
<tr>
<td>PPM</td>
<td>Pounds per Minute</td>
</tr>
<tr>
<td>PR</td>
<td>Phoenix Raven</td>
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</tbody>
</table>
PSF—Pounds per Square Foot
PSI—Pounds per Square Inch
PSP—Patient Support Pallet
PWR—Prepositional War Reserve
QA—Quality Assurance
QAR—Quality Assurance Representative
RAMCC—Regional Air Movement Control Center
RAW—Rear Axle Weight
RBL—Right Butt Line
RDD—Required Delivery Date
RDL—Reference Datum Line
RFID—Radio Frequency Identification
RF—ITV—Regional- In-Transit Visibility
RL—Reference Line
RO/RO—Roll On/Roll Off
ROH—Rear Overhang
RSP—Readiness Spares Package
RWY—Runway
SAA—Senior Airfield Authority
SAR—Search & Rescue
SBI—Special Background Investigation
SBTT—Single-Belly Twin Tandem Landing Gear (DC-10, KC-10, etc.)
SDDC—Surface Deployment & Distribution Command
SDDCTEA—Surface Deployment & Distribution Command Transportation Engineering Agency
SECAF—Secretary of the Air Force
SECDEF—Secretary of Defense
SECSTATE—Secretary of State
SECTRANS—Secretary of Transportation
SF—Security Forces
SID—Standard Instrument Departures
SL—Sea Level
SOFA—Status of Forces Agreements
SORTS—Status of Resources & Training System
SPIN—Special Instruction
SPR—Single Point Refueling
STD DAY—Standard Day (15°C/59°F)
STE—Secure Telephone Equipment
STN—Station
ST or STON—Short Ton (2,000 lbs.)
T/O—Takeoff
TACC—Tanker Airlift Control Center
TACON—Tactical Control
TACP—Tactical Air Control Party
TA—Transportation Agent
TALCE—Tanker-Airlift Control Element (obsolete term, but still used. See: CRE)
TC—AIMS II—Transportation Coordinator’s Automated Info for Movement Systems II
TCCC—Commander, US Transportation Command
TCMD—Transportation Control & Movement Document
TCN—Transportation Control Number
TCU—Transportation Control Unit
TDY—Temporary Duty
TMO—Traffic Management Office
TO—Technical Order
TPFDD—Time-Phased Force Deployment Data
TR—Transportation Request (as appropriate)
TSA—Transportation Security Administration
TSO—Technical Standards Order
TTP—Tactics, Techniques, & Procedures
TT—Twin Tandem (DC-8, B757, B767, etc.)
TWCF—Transportation Working Capital Fund
UCMJ—Uniform Code of Military Justice
UDL—Unit Deployment List
UIC—Unit Identification Code
ULD—Unit Load Device
ULN—Unit Line Number
ULS—Universal Loading Simulators
USAF—United States Air Force
USC—United States Code
USTRANSCOM—United States Transportation Command
UTC—Unit Type Code
UTE—Utilization
W#—Weight One, Two, Three, etc…
WBEL—Wide Body Elevator Loader
WBE—Wide Body Equivalent
WB—Wheel Base
WDT—Width
WL—Water Line
WOC—Wing Operations Center
WRM—War Readiness Materiel
WRSK—War Readiness Spares Kit
WT—Weight
ZFW—Zero Fuel Weight
Attachment 2

MHE REFERENCE CHARTS. USE REPRESENTATIVE DATA IN THIS ATTACHMENT TO COMPARE MHE COMPATIBILITY WITH DOOR HEIGHTS FOR THE VARIOUS CRAFT AIRFRAMES REFERENCED IN ATTACHMENT 3.

Table A2.1. Forklifts.

<table>
<thead>
<tr>
<th>MHE Type</th>
<th>Lifting Capacity (lbs.)</th>
<th>Load Center</th>
<th>463L Pallet Capacity</th>
<th>Tine Length</th>
<th>Lift Height (varies w/model)</th>
<th>Typical Manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>4K</td>
<td>4,000</td>
<td>24&quot;</td>
<td>None</td>
<td>30&quot;-60&quot;</td>
<td>0&quot;</td>
<td>104.5&quot;-167.5&quot;</td>
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<tr>
<td>(Note 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hyster, Yale, Drexel, Allis-Chalmers</td>
</tr>
<tr>
<td>6K</td>
<td>6,000</td>
<td>24&quot;</td>
<td>1</td>
<td>40&quot;</td>
<td>0&quot;</td>
<td>187&quot;</td>
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<tr>
<td>(Note 2)</td>
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<td></td>
<td>(Note 7)</td>
<td></td>
<td></td>
<td>Hyster, Clark, Allis-Chalmers</td>
</tr>
<tr>
<td>10K</td>
<td>10,000</td>
<td>48&quot;</td>
<td>1</td>
<td>X</td>
<td>0&quot;</td>
<td>150&quot;</td>
</tr>
<tr>
<td>Standard (Note 3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hyster, J I Case, Wiggins, Allis-Chalmers</td>
</tr>
<tr>
<td>10K AT</td>
<td>10,000</td>
<td>48&quot;</td>
<td>1</td>
<td>72&quot;</td>
<td>0&quot;</td>
<td>80&quot;</td>
</tr>
<tr>
<td>(Note 4,6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Liftking, J I Case</td>
</tr>
<tr>
<td>13K AT</td>
<td>13,000</td>
<td>48&quot;</td>
<td>1</td>
<td>72&quot;</td>
<td>0&quot;</td>
<td>79.5&quot;</td>
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<tr>
<td>(Note 5,6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Liftking, Clark</td>
</tr>
</tbody>
</table>

Note 1: Representative data taken from TO #36M2-2-189-1, model #J40XL.
Note 2: Representative data taken from TO #36M2-2-192-1, model #E60XL.
Note 3: Representative data taken from TO #36M2-2-107-21, model #H100C-AF-48.
Note 4: Representative data taken from TO #36M2-2-235-1, model #LKAF10.
Note 5: Representative data taken from TO #36M2-2-256-1, model #LKAF13-03.

Table A2.2. Loaders.

<table>
<thead>
<tr>
<th>MHE Type</th>
<th>Lifting Capacity (lbs.)</th>
<th>463L Pallet Capacity</th>
<th>Lift Height</th>
<th>Platform Dimensions</th>
<th>Typical Manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>25K</td>
<td>25,000</td>
<td>3</td>
<td>37.5&quot;</td>
<td>156&quot;</td>
<td>336&quot; 128&quot;</td>
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<tr>
<td>(Note 1)</td>
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<td></td>
<td></td>
<td></td>
<td>Emerson Electric, DRS</td>
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</table>
### Table A2.3. Air Stairs.

<table>
<thead>
<tr>
<th>MHE Type</th>
<th>Platform Capacity (lbs.)</th>
<th>Step Capacity (lb.)</th>
<th>Lift Height (in)</th>
<th>Chassis</th>
<th>Typical Manufacturers</th>
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<tr>
<td>SPS-2513</td>
<td>1,000</td>
<td>250</td>
<td>148</td>
<td>Ford F-350</td>
<td>Stinar</td>
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<tr>
<td>(Note 1)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SPS-3518</td>
<td>1,000</td>
<td>250</td>
<td>228</td>
<td>Ford F-350</td>
<td>Stinar</td>
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<tr>
<td>(Note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>A/S 32S-3</td>
<td>1,000</td>
<td>250</td>
<td>152</td>
<td>Ford F-250</td>
<td>SPACE Corp</td>
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<td>(Note 3)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AS228</td>
<td>1,000</td>
<td>250</td>
<td>228</td>
<td>Ford F-450</td>
<td>Lift-A-Loft</td>
</tr>
<tr>
<td>B-1 Maint. Platform</td>
<td>500</td>
<td>36</td>
<td>120</td>
<td>N/A</td>
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</tbody>
</table>

Note 1: Representative data taken from TO #35A3-21-1, model # SPS-2513.
Note 2: Representative data taken from TO #35A3-22-1, model # SPS-3518.
Note 3: Representative data taken from TO #35A3-11-1, model # 1500, 1500A.
Note 4: This is the total weight capacity that can be on the entire maintenance stand at one time.
Note 5: Recommended to always face stairs and hold railing when going up or down due to potential instability.
## Attachment 3

### CRAF DOOR HEIGHTS

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Door Ht from ground (in inches)</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Front/ Side Pax</td>
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<tr>
<td>A300-B4</td>
<td>176.7–188.2</td>
</tr>
<tr>
<td>A300-C4</td>
<td>176.7–188.2</td>
</tr>
<tr>
<td>A300-600</td>
<td>173.5–180.2</td>
</tr>
<tr>
<td>A300C4-600/ F4-600</td>
<td>173.5–180.2</td>
</tr>
<tr>
<td>A300-600R</td>
<td>173.5–180.2</td>
</tr>
<tr>
<td>A310-200</td>
<td>174–178.6</td>
</tr>
<tr>
<td>A310 C&amp;F</td>
<td>174–178.6</td>
</tr>
<tr>
<td>A310-300</td>
<td>173.9–179.0</td>
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<tr>
<td>A-318</td>
<td>133.2–135.6</td>
</tr>
<tr>
<td>A319-100</td>
<td>133.1–136</td>
</tr>
<tr>
<td>A320-200</td>
<td>133.4–137</td>
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<tr>
<td>A321-200</td>
<td>134.4–139.2</td>
</tr>
<tr>
<td>A330-200</td>
<td>174–183.6</td>
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<tr>
<td>A330-300</td>
<td>173.5–179.0</td>
</tr>
<tr>
<td>A340-200</td>
<td>173.2–183.4</td>
</tr>
<tr>
<td>A340-300</td>
<td>175.1–183.0</td>
</tr>
<tr>
<td>A340-500</td>
<td>177.8–187.3</td>
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<tr>
<td>A340-600</td>
<td>178.6–188.0</td>
</tr>
<tr>
<td>B727-200</td>
<td>96–121</td>
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<tr>
<td>B727-200F</td>
<td>X</td>
</tr>
<tr>
<td>B737-200</td>
<td>97–103</td>
</tr>
<tr>
<td>B737-200C</td>
<td>97–103</td>
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<tr>
<td>B737-300/400/500</td>
<td>103–109</td>
</tr>
<tr>
<td>B737-400C/F</td>
<td>103–109</td>
</tr>
<tr>
<td>B737-600/700/700C/800/900/900ER</td>
<td>102–108</td>
</tr>
<tr>
<td>Aircraft Type</td>
<td>Door Ht from ground (in inches)</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td>Front/ Side Pax</td>
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<tr>
<td>B747-400ER</td>
<td>187–205</td>
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<td>B757-300</td>
<td>149–158</td>
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<td>B767-200/200ER</td>
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<td>B767-200SF</td>
<td>163–177</td>
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<td>B767-300/300ER</td>
<td>162–177</td>
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<tr>
<td>B767-300F</td>
<td>163–173</td>
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<tr>
<td>B777-200ER/HGW</td>
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<tr>
<td>B777-300</td>
<td>185–197</td>
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<tr>
<td>B777-300ER</td>
<td>180–190</td>
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<tr>
<td>B777F</td>
<td>177</td>
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<tr>
<td>DC8-61F</td>
<td>163–177</td>
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<td>DC8-62F</td>
<td>162–177</td>
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<tr>
<td>DC8-63F</td>
<td>163–173</td>
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<tr>
<td>DC8-71F</td>
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<td>DC8-72F</td>
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<td>DC8-73F</td>
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<td>DC10-30F</td>
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<td>MD-87</td>
<td>185–199</td>
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<tr>
<td>MD90-30</td>
<td>185–197</td>
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</table>

Note: X = Non-Applicable. Additionally, information on each airframe type/series derived according to each aircraft’s manufacturer. Data shall be used for planning purposes only. Please refer to specific airframe manuals to ensure accurate data.
## Attachment 4

**PROPOSED NAMING CONVENTION WITH HISTORICAL FAA, U.S. AIR FORCE, AND U.S. NAVY NOMENCLATURES**

<table>
<thead>
<tr>
<th>Proposed Nomenclature</th>
<th>Reference Figure</th>
<th>FAA Name</th>
<th>Main Gear</th>
<th>Belly Gear</th>
<th>total # of wheels</th>
<th>FAA Designations</th>
<th>U.S. Air Force Designations</th>
<th>U.S. NAVY Designations</th>
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</thead>
<tbody>
<tr>
<td>S 3</td>
<td></td>
<td>Single Wheel</td>
<td>SW</td>
<td>2</td>
<td>S</td>
<td>Single, Tricycle</td>
<td>Single Wheel</td>
<td>Single Tricycle</td>
</tr>
<tr>
<td>S 4</td>
<td></td>
<td>Single Wheel</td>
<td>SW</td>
<td>2</td>
<td>S</td>
<td>Single, Tricycle</td>
<td>Dual wheel</td>
<td>Single Tricycle</td>
</tr>
<tr>
<td>D 5</td>
<td></td>
<td>Dual Wheel</td>
<td>DW</td>
<td>4</td>
<td>T</td>
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<td>Single Wheel</td>
<td>Single Tricycle</td>
</tr>
<tr>
<td>D 6</td>
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<td>Dual Wheel</td>
<td>DW</td>
<td>4</td>
<td>T</td>
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<td>Dual wheel</td>
<td>Dual Tricycle</td>
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<td>2S 7</td>
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<td>Single Tandem</td>
<td>4</td>
<td>S-TA</td>
<td>Single, Tandem</td>
<td>Single Tricycle</td>
<td>Single Tandem Tricycle</td>
<td>SITT</td>
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<td>2T 8</td>
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<td>12</td>
<td>TR-TA</td>
<td>Tricycle</td>
<td>Dual wheel</td>
<td>Triple Tandem Tricycle</td>
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<td>DT</td>
<td>8</td>
<td>T-TA</td>
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<td>Dual wheel</td>
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<tr>
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<td>DT DW</td>
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<td>2D/D2 11</td>
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<td>DT DT</td>
<td>12</td>
<td>T-TA I</td>
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<td>Single Tandem Tricycle</td>
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<td>2D/D2 16</td>
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<td>Double Dual Tandem</td>
<td>DT DT</td>
<td>12</td>
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<td>Twin-Tandem, Tricycle</td>
<td>Single Tandem Tricycle</td>
<td>DDT</td>
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<tr>
<td>3D 13</td>
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<td>Tandem</td>
<td>TDT</td>
<td>12</td>
<td>T-TA</td>
<td>Twin-Tandem, Tricycle</td>
<td>Dual wheel</td>
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<td>5D 14</td>
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<td>20</td>
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<td>4 across</td>
<td>Twin Delta Tandem</td>
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<tr>
<td>5D 15</td>
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<td>4 across</td>
<td>29</td>
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<td>4 across</td>
<td>Twin Tandem</td>
<td>Twin Tandem</td>
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<td>2D/3D 16</td>
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<td>T-D-TA</td>
<td>Twin-Delta Tandem, Tricycle</td>
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<td>A380</td>
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**Note:** A standard naming convention allows uniformity and consistency among federal agencies and external entities when naming aircraft gear configurations. Attachment 4 provides examples of known gear configurations.
MEMORANDUM FOR SEE DISTRIBUTION LIST

FROM: TCCC

SUBJECT: DOD Contract Flight Safety

1. A serious potential safety issue has surfaced regarding the transportation of our Soldiers, Sailors, Marines, Airmen, and Coast Guardsmen from active, guard, and reserve units on DOD contract commercial aircraft. Our Civil Reserve Air Fleet (CRAF) partners have reported several cases in the past few months in which passenger and baggage weights used to calculate the aircraft’s weight and balance have been off by as much as 20,000 lbs. Another note of concern is the improper documentation of hazardous materials and weapons handling/storage inside aircraft cabins. We have notified the commercial carriers to remain vigilant and have given them the authority to challenge suspect passenger and baggage weights, improper hazardous material documentation, and weapons handling/storage in aircraft cabins at the point of embarkation, even if the result may delay the mission.

2. DOD personnel and baggage weights are typically heavier than standard weights for the traveling public. As such, DOD guidance in the Defense Travel Regulation requires actual weights for personnel and cargo for all DOD commercial charter flights. The DOD mandated this requirement as a result of the fatal DC-8 Arrow Air Flight 1285 in 1985. Weight and balance calculations were inaccurate and cited as a primary contributing factor.

3. While my staff continues to work with your staffs to convey accurate and timely guidance, my top priority is the safe and expeditious transportation of our Nation’s all-volunteer Armed Forces around the globe. Proper weight and balance documentation, hazardous material reporting, and weapons handling ensure we get our warriors safely to and from the fight. Thanks for your continued support in disseminating this critical guidance.

DUNCAN J. MCNABB
General, USAF
Commander

Attachment:
Distribution List
## AMC PAMPHLET 24-2 SERIES OLD VS. NEW NUMBERING SYSTEM

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