

Chapter 2

Air Detachment Equipment Supervisor

Topics

- 1.0.0 Air Detachment Equipment Supervisor
Responsibilities

To hear audio, click on the box.



Overview

An Air Detachment, according to *Naval Construction Force Policy*, OPNAVINST 5450.46K, is an advance element of a Naval Mobile Construction Battalion, and generally consists of 2 officers and 87 enlisted deployed from the main Naval Mobile Construction Battalion body to rapidly perform construction and engineering operations. It is specifically organized, trained, and equipped for strategic rapid deployment via air asset to perform light to medium horizontal, vertical, and specialized construction. Typical tasking includes construction of base camps, roads, bridges, and utilities construction or repair, force protection support, and disaster recovery.

Operational readiness is of high importance. An Air Detachment must be capable of deploying within 48 hours of notification. Equipped with an organic Table of Allowance, an Air Detachment must also be capable of sustaining construction operations at the deployed site for 30 days without resupply, except for ammunition, subsistence, and petroleum, oil, and lubricants.

This chapter presents the basic information required to perform duties effectively when assigned as the Air Detachment Equipment Supervisor.

Objectives


When you have completed this chapter, you will be able to do the following:

1. Understand the responsibilities of the Air Detachment Equipment Supervisor.
2. Understand equipment platoon operations.

Prerequisites

None

This course map shows all of the chapters in Equipment Operator (EO) Advanced. The suggested training order begins at the bottom and proceeds up. Skill levels increase as you advance on the course map.

Well Drilling Supervisor and Operations		E
Asphalt Plant Supervisor and Operations		O
Concrete Batch Plant Supervisor and Operations		A
Crusher Supervisor and Operations		D
Quarry Supervisor and Operations		V
Project Supervisor		A
Crane Crew Supervisor		N
Air Detachment Equipment Supervisor		C
Transportation Supervisor		E

Features of this Manual

This manual has several features which make it easy to use online.

- Figure and table numbers in the text are italicized. The figure or table is either next to or below the text that refers to it.
- The first time a glossary term appears in the text, it is bold and italicized. When your cursor crosses over that word or phrase, a popup box displays with the appropriate definition.
- Audio and video clips are included in the text, with italicized instructions telling you where to click to activate it.
- Review questions that apply to a section are listed under the Test Your Knowledge banner at the end of the section. Select the answer you choose. If the answer is correct, you will be taken to the next section heading. If the answer is incorrect, you will be taken to the area in the chapter where the information is for review. When you have completed your review, select anywhere in that area to return to the review question. Try to answer the question again.
- Review questions are included at the end of this chapter. Select the answer you choose. If the answer is correct, you will be taken to the next question. If the answer is incorrect, you will be taken to the area in the chapter where the information is for review. When you have completed your review, select anywhere in that area to return to the review question. Try to answer the question again.

1.0.0 AIR DETACHMENT EQUIPMENT SUPERVISOR RESPONSIBILITIES

An Air Detachment (Air Det) is usually assigned a limited amount of Civil Engineer Support Equipment (CESE) and a portion of the Table of Allowance (TOA). However, an Air Det is usually task-organized in both manning and gear to meet a specific mission. The Officer in Charge (OIC) serves as the equipment officer for the CESE assigned to the Air Det; however, the daily management of CESE is the responsibility of the senior Alfa Company rating assigned to the Air Det, who serves as the Equipment Supervisor.

1.1.0 Crew Assignments

Each Naval Mobile Construction Battalion (NMCB) organizes and trains a sufficient number of personnel to be capable of deploying as an Air Det. Personnel are trained to ensure the Air Det possess the following capabilities:

- Well drilling
- Rapid runway repair
- Surveying and drafting
- Advanced base construction
- Water purification
- Camp sanitation
- Weapon maintenance
- Radio operators
- Post office operations
- Photography
- Barber
- Air retrograde requirements

Appointed in writing, an Air Det has two Navy Civil Engineer Corps (CEC) officers, a lieutenant or lieutenant commander who serves as the OIC, and a lieutenant junior grade who serves as the assistant officer in charge (AOIC). Additionally, it has 87 enlisted personnel.

As shown in *Figure 2-1*, an Air Det consists of one command element and three platoons: a support platoon, a horizontal construction platoon, and a vertical construction platoon. *Table 2-1* shows the number of personnel per rating and rank within the platoons.

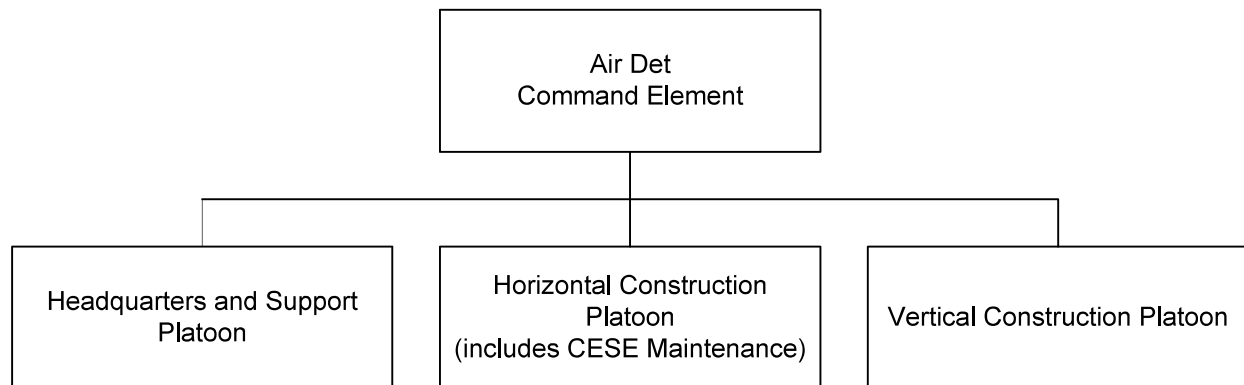


Figure 2-1 — Air Det organization.

Table 2-1 — Air Det table of organization.

POSITION	RATING/RANK	NUMBER OF PERSONNEL
OIC (AD6)	LT (O-3) LCDR (O4)	1
AOIC (AD6A)	LTJG (O-2)	1
AIR CHIEF (AD5)	SCPO (occupational field 13)	1
OPS CHIEF (AD3)	builder chief	1
EQUIPMENT CHIEF (AD4)	equipment operator chief	1
HQ & SUPPORT PLT	utilitiesman first class petty officer	1
HQ & SUPPORT PLT	utilitiesman second class petty officer	2
HQ & SUPPORT PLT	utilitiesman third class petty officer	3
HQ & SUPPORT PLT	utilitiesman constructionman	4
HQ & SUPPORT PLT	construction electrician first class petty officer	1
HQ & SUPPORT PLT	construction electrician second class petty officer	1
HQ & SUPPORT PLT	construction electrician third class petty officer	3
HQ & SUPPORT PLT	construction electrician constructionman	5
HQ & SUPPORT PLT	storekeeper first class petty officer	1
HQ & SUPPORT PLT	storekeeper seaman	1
HQ & SUPPORT PLT	engineering aide second class petty officer	1
HQ & SUPPORT PLT	engineering aide constructionman	1
HQ & SUPPORT PLT	gunner's mate second class petty officer	1
HQ & SUPPORT PLT	culinary specialist second class petty officer	1
HQ & SUPPORT PLT	culinary specialist seaman	1
HQ & SUPPORT PLT	hospital corpsman second class petty officer	1
HQ & SUPPORT PLT	hospital corpsman third class petty officer	1
HQ & SUPPORT PLT	yeoman third class petty officer/seaman	1
HORIZONTAL PLT	equipment operator first class petty officer	1
HORIZONTAL PLT	equipment operator second class petty officer	4
HORIZONTAL PLT	equipment operator third class petty officer	3
HORIZONTAL PLT	equipment operator constructionman	9
HORIZONTAL PLT	construction mechanic first class petty officer	1
HORIZONTAL PLT	construction mechanic second class petty officer	2
HORIZONTAL PLT	construction mechanic third class petty officer	3
HORIZONTAL PLT	construction mechanic constructionman	4
VERTICAL PLT	builder first class petty officer	1
VERTICAL PLT	builder second class petty officer	3
VERTICAL PLT	builder third class petty officer	4
VERTICAL PLT	builder constructionman	9
VERTICAL PLT	steelworker first class petty officer	1
VERTICAL PLT	steelworker second class petty officer	1
VERTICAL PLT	steelworker third class petty officer	1
VERTICAL PLT	steelworker constructionman	7
TOTAL		89

The Air Det can be under the operational control (OPCON) of the battalion commanding officer (CO) or another commander when designated by the command relationship specified by deployment orders; however, administration control (ADCON) for the Air Det usually remains with the battalion. In situation where the Air Det is required to have a standing embark organization, the Air Det's AOIC usually leads the Air Det's embarkation organization shown in *Figure 2-2*.

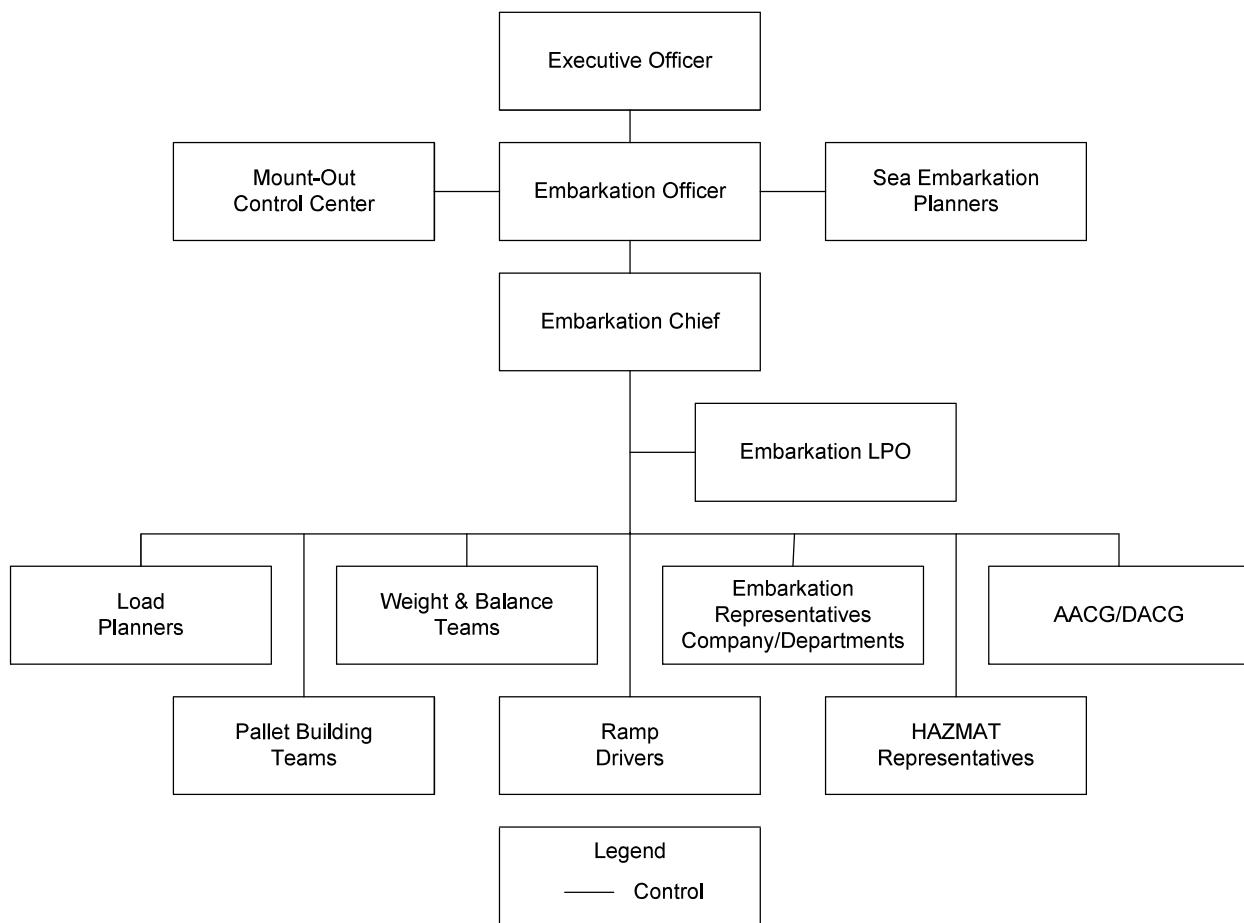


Figure 2-2 — Embarkation organization.

The Equipment Supervisor organizes the horizontal construction platoon and assigns military and job-related responsibilities. Job assignments are organized similar to an Alfa company operation. The job assignments are as follows: Dispatcher, Equipment Yard Supervisor ("Yard Boss"), and Collateral Equipment/Attachment Custodian, License Examiner, Maintenance Supervisor, Shop Work Center Supervisors, Inspectors, Det Repair Parts Petty Officer (RPPO), Technical Librarian, Floor Mechanics, Field Repair Crews, and project crews. Personnel may be assigned two or three job responsibilities, depending on the size of the platoon. These responsibilities are described in *Naval Construction Force (NCF) Equipment Management Instruction*, COMFIRSTNCDINST 11200.2.

1.1.1 Horizontal Construction Platoon Administration Readiness

Horizontal construction platoon administration readiness is the process of storing at least a 30-day supply of all required forms and office supplies in a mount-out box or location. This allows the Equipment Supervisor to manage the operations of a horizontal construction platoon effectively in the event of an Air Det mount-out. The Air Det Dispatcher, License Examiner, and Maintenance Supervisor should store the following forms:

- Daily Dispatching Record of Motor Vehicles (“Dispatcher’s Log”), NAVFAC Form 9-11240/2
- Operator’s Inspection Guide and Trouble Report (“Hard Card”), NAVFAC Form 9-11240/13
- Operator’s Daily PM Report, NAVFAC Form 9-11260/4
- Motor Equipment Utilization Record (“Trip Ticket”), DD Form 1970
- Collateral Custody Record Card, 1NCD CB 60 Form
- Non-National Stock Number (NSN) requisition, NAVSUP Form 1250-2
- Vehicle/Construction Equipment Preventive Maintenance Record Card, NAVFAC Form 11240/6
- Maintenance Action Form, “2K”, OPNAV Form 4790/2K
- Supplemental Form, “2L”, OPNAV Form 4790/2L
- Operator’s Identification Card, OF-346
- Construction Equipment Operator’s License, NAVFAC Form 11260/2
- Application for Vehicle Operator’s Identification Card, NAVFAC Form 11240/10
- Application for Construction Equipment Operator’s license, NAVFAC Form 11260/1
- Physical Fitness Inquiry for Motor Vehicle Operators, Standard Form 47
- Construction Equipment Operator License Record, NAVFAC 11260/3
- Miscellaneous office supplies

It is important that the Air Det Dispatcher, License Examiner, and Maintenance Supervisor not wait for notification of mount-out to start acquiring these required forms. They may find that there are not enough forms in stock to supply the needs for the daily operations of the horizontal construction platoon.

1.2.0 Table of Allowance

An organic TOA outfits an NMCB with the necessary supplies, tools, and CESE to perform the unit’s mission in contingency, wartime, and disaster recovery operations for 60 days (1,200 construction hours) without resupply, except ammunition is limited to 15 days, subsistence rations are limited to five days, and petroleum, oil, and lubricants (POL) are limited to three days. For planning and administration purposes, supplies are divided in various classes. Class I is substance, Class III is POL, and Class V is ammunition.

In both contingency and day to day operations, an NMCB may be required to support, simultaneously, multiple tasks in various locations. To support these tasks, an NMCB TOA is echeloned into an Air Det, an Air Echelon, and a Sea Echelon. The echelons are based on anticipated prioritization of personnel, material, equipment and the availability of Airlift versus sea support. An NMCB in the Advanced Base Functional Component (ABFC)/TOA system is designated “P-25,” whereas an Air Det is designated “P-25AD1.”

An organic TOA for an Air Det is designed to sustain for 30 days (600 construction hours) without resupply and has the same limited amount of ammunition, subsistence and POL as that of a TOA for an NMCB. *Table 2-2* lists the CESE organic to an Air Det.

Table 2-2 — Civil engineering support equipment organic to an Air Det.

EC CODE	TAMCN	DESCRIPTION	QTY
313502	B03907B	Compressor, Air Rotary, 250 cfm At 100 PSIG DED	1
252161		Distributor, Water 2,000-Gallon, MTRV	1
082902		Dolly Trailer Converter 18,000-lb Payload	3
511024	B06357B	Floodlight Set, Electric Self-Contained Trailer-Mounted	2
512231	B09717B	Generator Set, 30 Kw (TG) DED Skid MTD MEP 805B	2
442021	B10817B	Grader, Road Motorized DED 6x4 Open Canopy	2
452123		Loader, Scoop Wheel-Mounted 125 Net Hp Min	2
453211		Loader, Skid Steer DED 73HP Min with 78" Dirt	2
243301		Mixer Concrete 11 Cu Foot Wheel-Mounted	2
463520	B17857B	Roller, Motorized, Vibratory Compactor, Front	2
522021		Pump Water/Trash, Centrifugal DED 33,000 GPH (400)	1
590001		Saw Radial Overarm Woodworking Shop 16-Inch	1
081611	D02357K	Semitrailer, Stake Breakbulk/ISO Container	2
082655		Semitrailer, Lowbed, 55t, DED, Hydraulic Powered	4
483010		Tractor, Crawler, Size T-5, Straight Blade, Hydraulic	2
487510	B25677B	Tractor, Wheeled, Industrial 4x2 Net Hp Min	2
080451	D08607K	Trailer, Cargo, 2-Wheel, 1-1/4 Ton Payload (2,500-lbs)	2
088002	D08807K	Trailer, Tank, 400-Gallon, Stainless Steel Tank 2	2
58861	D10627K	Truck, Cargo, 7-Ton MTRV 6x6 Extra Long Wheel Base	4
058761	D10737K	Truck, Dump, 6x6, 7-Ton MTRV w/Winch MK30	4
182011		Truck, Forklift Rough Terrain 7,000-lbs	2
182012		Truck, Forklift 11K/7K-lbs, DED Pneumatic Tire 4x4	1
074661		Truck, Fuel/Water Tanker MTRV 2,000 Gallons	1
036361		Truck, Maintenance, Utility 4x4, DED, Automatic	1
060761	D11347K	Truck, Tractor, 7-Ton MTRV w/o Winch MK31	5
036055	D11597K	Truck Utility Expnd Capacity, HMMWV 4-Seat M1151	4
036057		Truck Utility Expnd Capacity, HMMWV 2-Seat M1152	3
517071	B19647B	Welder, Arc Electric, 300 Amps, AC/DC TIG DED	2

The Naval Facilities Expeditionary Logistics Center (NFELC) in Port Hueneme, California, is the system manager that maintains and annually reviews Naval Construction Force (NCF) TOAs, develops a new allowance as directed by the Chief of Civil Engineers (COMNAVFACENGCOM), and collects Allowance Change Request/Reports, NAVSUP Forms 1220-2 for revisions to TOAs.

The Equipment Supervisor and the lead mechanic should review the TA41 and request the tools and supplies required to support the Air Det horizontal construction platoon operation. Examples of these tools and supplies are as follows:

- Kit 80013, mechanic hand look for two men
- Kit 80031, metric support tools
- Kit 80057, tire service tools (small)
- Kit 80107, lubrication equipment and accessories

If you are serving as Equipment Supervisor do not forget other important items, such as a bundle of rags; a hand-operated fuel/oil dispensing pump for 55-gallon drums (commonly known in the NCF as a “hurdy-gurdy”); 55-gallon drums for fuel, oil cans, rigging gear, jumper cables; tools for the field maintenance truck, and tools to support any construction tasking. The request list is forwarded through the Air Det chain of command and reviewed and approved by the battalion staff.

The lead mechanic is responsible for coordinating with the Maintenance Supervisor when requesting POL products as well as both types of repair parts: parts particular and parts common.

Normally, the TA41 kits and supplies are stored in a supply warehouse. During the 48-hour mount-out, the requested kits and supplies are drawn out and staged at the marshaling area. The Equipment Supervisor follows up on the requested tools and supplies throughout the mount-out period. Overlooked and forgotten items can hamper a well-planned Air Det operation.

1.2.1 CESE Requirements

The equipment allowance may require local modifications due to availability of equipment, the mission assigned, and the aircraft limitations. The knowledge and expertise of the Equipment Supervisor enhances the ability of the Air Det to identify and request the required CESE, supplies, and POL for the Air Det mission. When identifying CESE, the Equipment Supervisor should consider the following:

- Convoy capabilities
- Equipment specification such as weight, cube
- Parts support
- Equipment conditions
- Aircraft certification and certificability

1.3.0 CESE Preparation

Upon notification of the Air Det to mount-out, the battalion re-organizes and sets up a mount-out control center (MOCC). The MOCC is under the direction of the battalion executive officer. The MOCC controls, coordinates, and monitors the movement of all personnel, supplies, and equipment to the marshaling area. The MOCC and the embarkation staff control all aspects of an NMCB mount-out and serve as the coordinating center for all the companies and battalion staff.

During this period, the battalion is normally organized into 12-hour shifts. Alfa Company is responsible for all CESE preparation. During this time period, the Air Det is usually involved in briefings, medical and dental checkups, administration office checkups, and personnel readiness inspections. However, the Air Det Equipment Supervisor needs to schedule time to communicate with Alfa Company, and follow up on the status of CESE requested.

Embarking on an aircraft requires special loading procedures for several types of CESE assigned to the battalion TOA. Alfa Company is responsible for following these procedures that include the following: the removal of dump truck headache racks, equipment exhaust stacks, dozer blades, counterweights, and equipment roll over protective structure (ROPS). Also, the fuel tank of a vehicle to be embarked by airlift must be between one-fourth and three-fourths full; however, when the vehicle has to be placed on the ramp inside the aircraft, the fuel tank should never be more than one-third full. Accomplishment of these procedures is a major area of responsibility for the Air Det horizontal construction platoon; therefore, the Air Det must know where Alfa Company placed the bolts, nuts, and parts for the disassembled equipment because the Air Det will be required to reassemble these items on site.

1.3.1 Collateral Equipment

All collateral equipment accompanies vehicles and equipment. The Alfa Company collateral custodian delegates the responsibility and accountability of the Air Det CESE collateral equipment and attachments to the Air Det Equipment Supervisor. This area of responsibility is usually then delegated to the assigned Air Det collateral equipment custodian. The custodian needs to acquire a list of the collateral equipment and attachments embarked with the Air Det CESE. The management of the Air Det collateral equipment and attachment is the same as for the battalion and is outlined in COMFIRSTNCDINST 11200.2. Proper management of collateral equipment and attachments enhances the equipment management program for the Air Det. When this area is neglected, a high cost Air Det collateral equipment and attachment turn-in can occur and detract from any effective equipment management program you may have attempted to enforce.

Test your Knowledge (Select the Correct Response)

1. An Air Det consists of what platoons?
 - A. Horizontal construction platoon, support platoon, and vertical construction platoon
 - B. Transportation platoon, headquarters platoon, and support platoon
 - C. CESE platoon, headquarters platoon, transportation platoon
 - D. Headquarters platoon, support platoon, horizontal platoon
2. Horizontal construction platoon administration readiness is the process of storing office supplies and forms to provide support for a minimum of how many days?
 - A. 30
 - B. 25
 - C. 20
 - D. 15
3. The Air Det must be self sufficient for a maximum of how many days?
 - A. 30
 - B. 25
 - C. 15
 - D. 10

1.4.0 Military Aircrafts

For airlift movement, the NCF relies on three types of military aircrafts: the C-130, C-5, and the C-17. These three military aircrafts have various differences, including allowable cabin load (ACL), which is the weight of cargo, baggage, and passengers that may be transported by a specific aircraft. ACL is limited by several factors such as distance, route to be flown, fuel load, weather, and airfield characteristics.

The following section briefly describes these aircrafts as well as covers the basic planning factors necessary to prepare for airlift aboard such aircrafts. For in-depth information regarding planning factors and loading restrictions and limitations, refer to *AMC Affiliation Workbook 36-101 Volume 2 Airlift Planner Course*.

1.4.1 C-130

The C-130 aircraft, also referred to as the Hercules (*Figure 2-3*), is used for ***intra-theater (tactical) airlifts***. Typical C-130 use includes moving cargo from main theater staging bases (positioned from the US by larger airlift aircrafts or ship) to front line areas.



Figure 2-3 — C-130 aircraft.

Dimensional Planning Factor – The size of the C-130 allows operation into airfields that prohibit the use of larger airlift aircraft (normally 5,000 feet or less). The cargo compartment is 624 inches long (612 inches usable), 123 inches wide (105-inch-wide usable floor width with dual rails installed), and 108 inches high. This cargo compartment cross section allows the loading of items with a maximum dimension of 102 inches long and 115 inches wide. Under certain circumstances and only after coordinating with the Tanker/Airlift Control Element (TALCE), these dimensions may be exceeded.

Weight Considerations – Weight is critical to safe aircraft operation. The load planner must adhere to maximum load weight limitations. The planning ACL is 25,000 pounds. Heavier loads are possible when permitted by the Operational Order or after coordinating with the affiliated TALCE. The cargo compartment has specific weight and height restrictions in different areas. The load planner must consider these limitations

when planning cargo placement. These restrictions and limitations are identified in Figure 2-4.

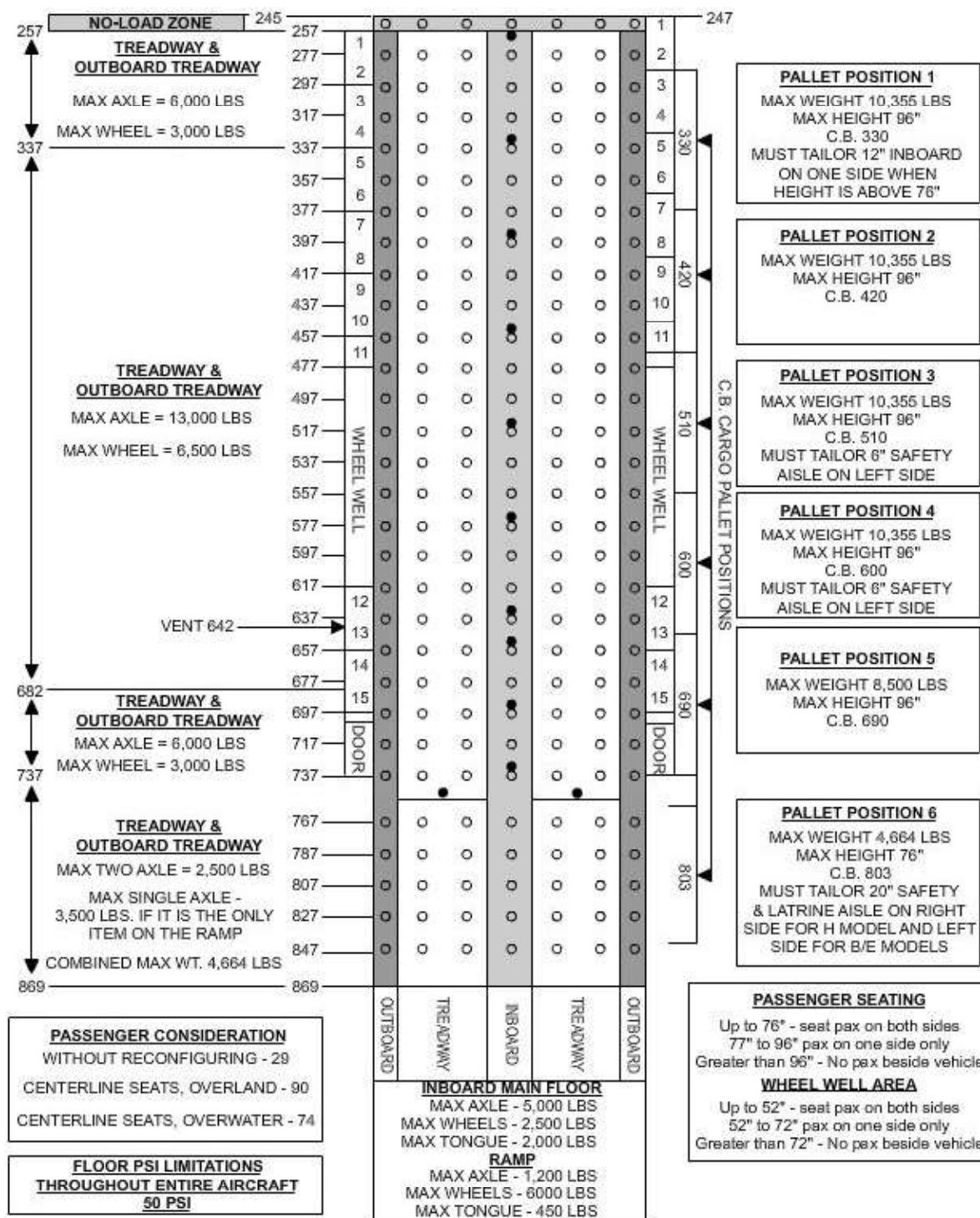


Figure 2-4 — C-130 floor schematic.

1.4.2 C-5

The C-5 aircraft, also referred to the Galaxy (*Figure 2-5*), is used for ***inter-theater (strategic) airlifts*** of outsized cargo. Typical C-5 use includes moving outsized cargo such as large helicopters, tanks, and communication vans.



Figure 2-5 — C-5 aircraft.

Dimensional Planning Factors – The C-5 is the largest US airlift aircraft. Its size allows it to carry cargo that will not fit into any other airlift aircraft. The cargo compartment is 1736 inches long, 228 inches wide and 162 inches high. The C-5 employs the use of two cargo-loading ramps. The forward ramp is 122 inches long and 228 inches wide, and the aft ramp is 155 inches long and 228 inches wide.

Weight Considerations – As with all aircraft, weight limitations are absolutely critical to flight. The normal planning ACL for the C-5 is 150,000 pounds, but you must adhere to the C-5's specific weight limitations. Specific weight restrictions apply to the cargo compartment floor. These restrictions and limitations are identified in *Figure 2-6*.

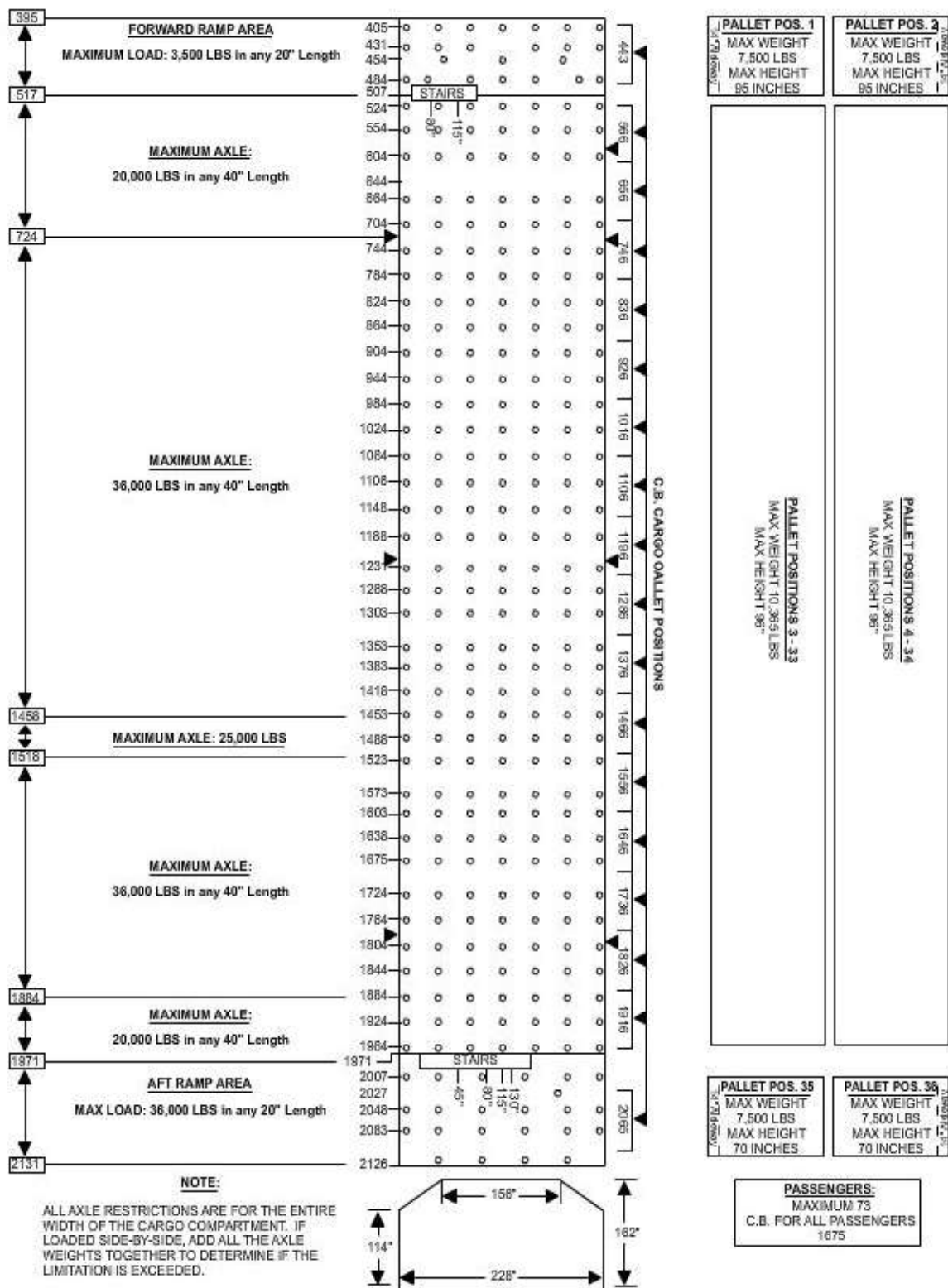


Figure 2-6 — C-5 floor schematic.

1.4.3 C-17

The C-17 aircraft, also referred to as the Globemaster III (*Figure 2-7*), is used for the intra-theater (tactical) airlifts of large, outsized items of cargo to small austere airfields at or near the battle area, by aerial delivery or air-land method. It has the capability to be reconfigured in-flight from rolling stock configuration to the following: logistic palletized configuration, equipment/paratroop air-drop configuration, passenger/troop carrying configuration, or litter/ambulatory aero-medical configuration. Should the mission dictate, onboard aircraft equipment will accommodate any combination of the above configurations.



Figure 2-7 — C-17 aircraft.

Dimensional Planning Factors – The size of the C-17 cargo compartment allows it to carry cargo that will not fit on other airlift aircraft. The compartment is 818 inches long, 213 inches wide (2 inches above the floor is 216 inches wide), and cargo may be loaded up to 142 inches high. The usable dimension of the cargo ramp is 238 inches long, 213 inches wide, and 128 inches high (when closed). These dimensions allow the loading of outsized items of cargo measuring 142 inches high or 208 inches wide. If cargo exceeds these dimensions, it must be coordinated with the TALCE.

Weight Considerations – The C-17 has specific weight limitations which must be adhered to. The ACL of the C-17 is variable, but for most operations it is up to 90,000 pounds. Similar to the other aircrafts, specific weight restrictions apply to different areas of the cargo compartment floor. These restrictions are identified in *Figure 2-8*.

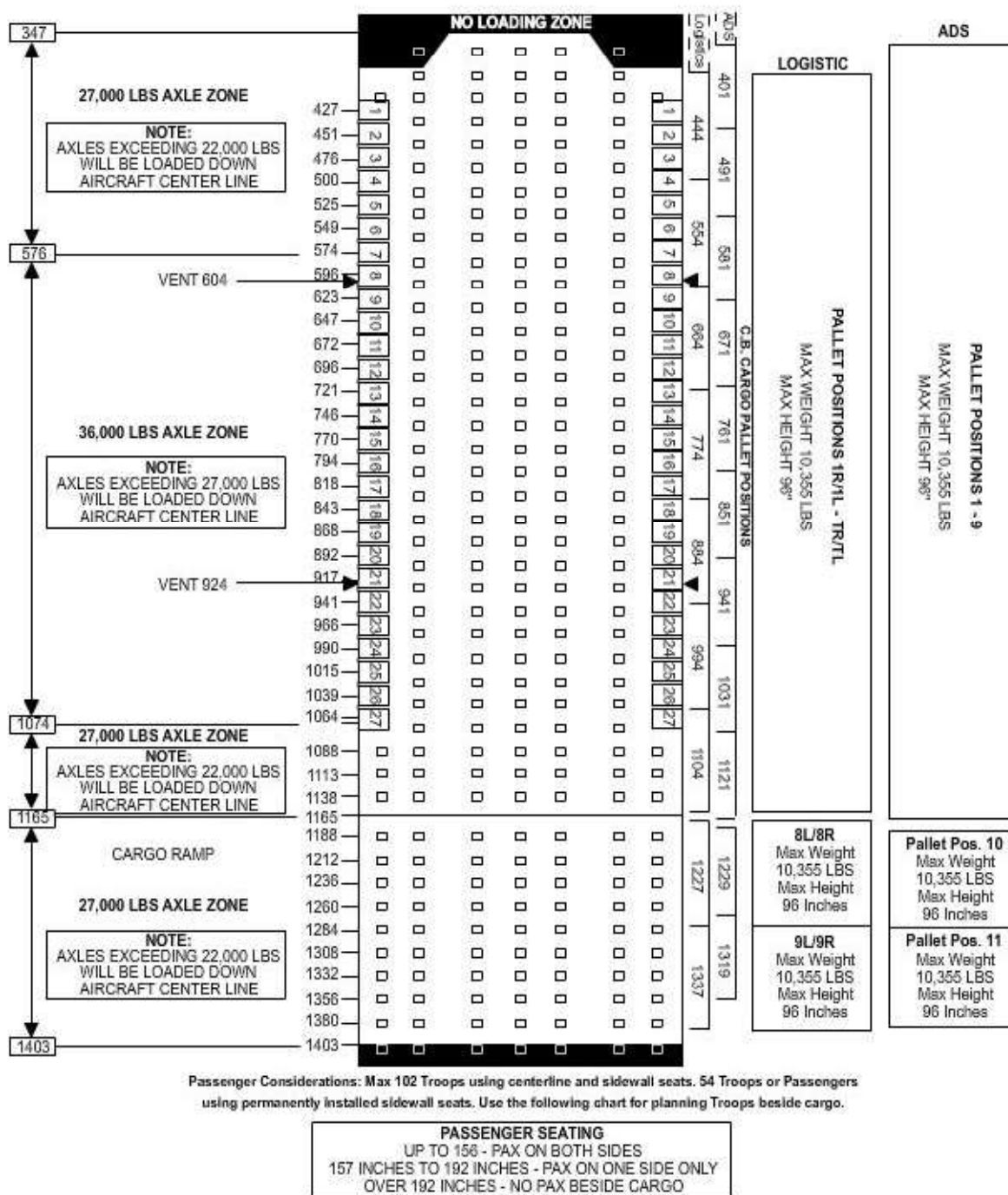


Figure 2-8 — C-17 floor schematic.

Test your Knowledge (Select the Correct Response)

4. For airlift movement, the NCF relies on what aircrafts?
- A. C-130, C-5, and KC-10
 - B. C-17, C-5 and KC-135
 - C. C-130, C-5, and C-17
 - D. C-17, KC-10 and KC-135
5. What is the largest US airlift aircraft?
- A. C-130
 - B. C-5
 - C. KC-135
 - D. KC-10

1.5.0 Palletization

Adopted by the Air Force as a standard for moving cargo, the 463L system facilitates rapid movement of general cargo aboard airlift aircrafts. It encompasses all aspects of cargo-loading including materials-handling equipment, cargo-loading platforms, restraints equipment, and in-aircraft systems. Such a system is extremely efficient and can reduce ground times by as much as 75 percent.

1.5.1 Dual Rail System

The dual rail system is permanently installed in all aircrafts used by the NCF. This system consists of rows of rollers that allow easy movement of palletized cargo into the aircraft. Many of these rollers are stowable to convert the cargo deck to a flat, clear loading surface for wheel cargo. The side rails guide the pallets into the aircraft and provide lateral and vertical restraint. The rails have detent locks that prevent forward and aft movement of pallets during flight.

1.5.2 463L Pallet

The 463L pallet is made of corrosion-resistant aluminum and has a soft wood core framed on all sides by aluminum rails (*Figure 2-9*). The rails have 22 steel tie-down rings attached in such a manner that six rings are on each long side and five rings are on each short side. The rails also have indents which are designed to accept the detent locks. These locks are located on numerous types of material-handling equipment and are found on board all airlift capable aircraft.

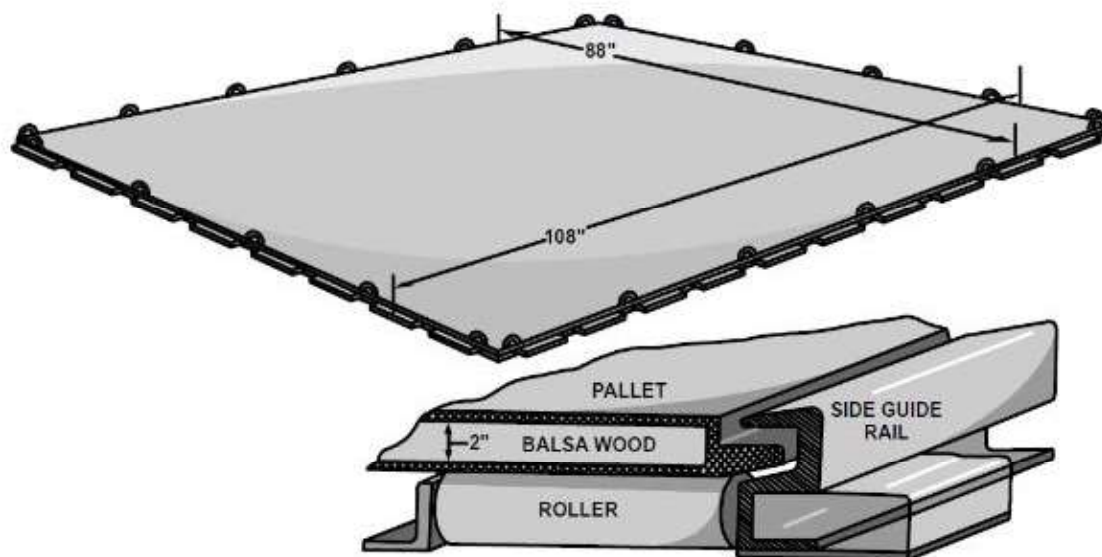


Figure 2-9 — 463L pallet.

The overall dimensions of the 463L pallet are 88 inches by 108 inches by 2 1/4 inches thick. However, the usable dimensions of the upper surface are 84 inches by 104 inches. This allows for 2 inches around the perimeter of the pallet to attach straps, nets and other restraints devices. An empty 463L pallet weighs 290 pounds and has a maximum cargo-carrying capacity of 10,000 pounds when using nets; however, the desired load capacity is 7,500 pounds to prolong pallet life.

When there is a requirement to palletize cargo that exceeds the usable dimensions of a 463L pallet, two or more pallets are joined together, as shown in *Figure 2-10*. This is referred to as the marrying of pallets or two-pallet trains. Before marrying pallets, inspect them to be sure they are clean and in good repair. Ensure the rails are not bowed and the tie-down rings are securely mounted. After checking the pallets, place them on a cargo dock, rollerized flatbed truck, or K-loader. Align the indents along the 108 side of each pallet. Install spacers, like the one shown in *Figure 2-11*, between the pallets. The spaces are used to keep the pallets aligned and properly spaced so they will lock into the rail system of the aircraft.

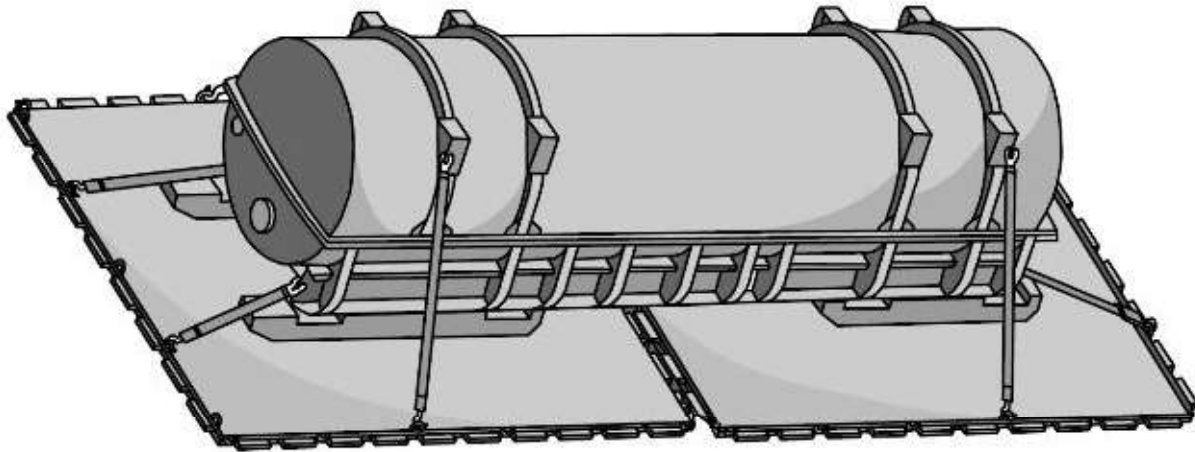


Figure 2-10 — Two-pallet train (couple on 88" side).

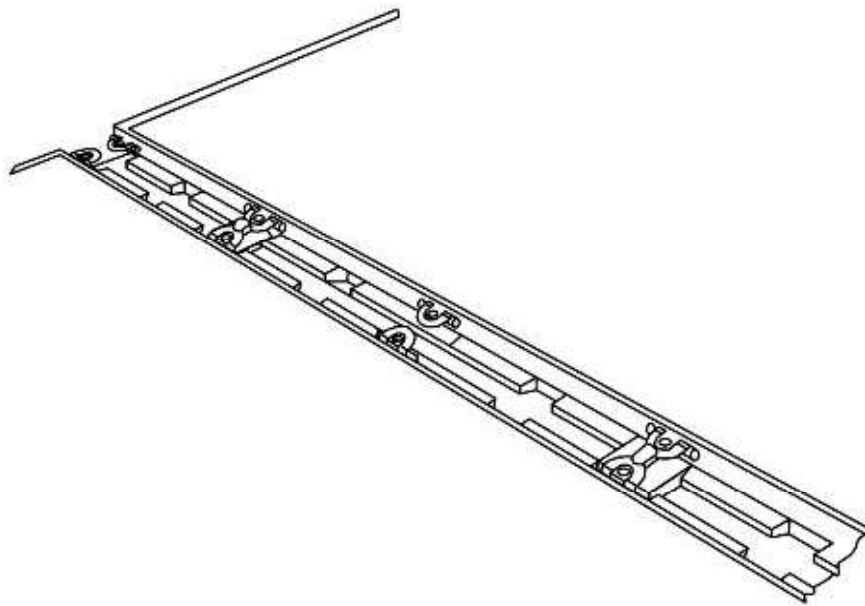
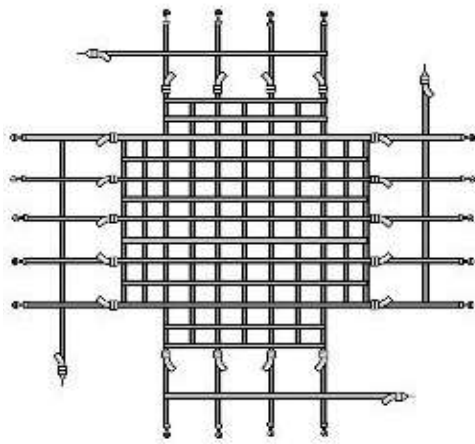


Figure 2-11 — Pallet spacer.

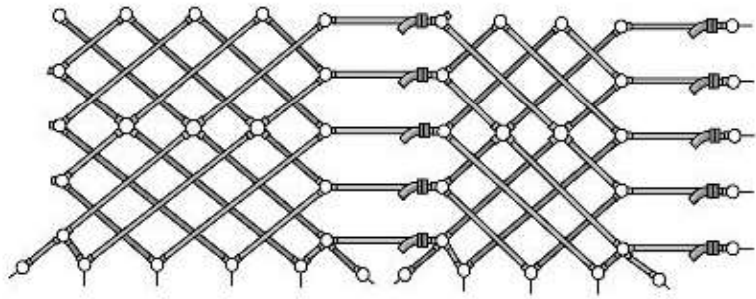
Because 463L pallets are expensive to purchase and refurbish, and could be required for future airlifts, care must be taken to protect them. This includes never pushing or sliding pallets across any solid surface because this will damage the skin. It also includes never stacking empty pallets upside down, which could damage the rings or aluminum-skinned surface.

1.5.3 Pallet Nets

There are three pallet nets to a set: one top net and two side nets (*Figure 2-12*). The top net is yellow in color and the side nets are green. As shown in *Figure 2-13*, the side nets attach to the rings of the pallet, and the top nets are attached by hooks to the side nets. These nets have multiple adjustment points and may be tightened to fit snugly on most loads.



463L Top Net



463L Side Net

Figure 2-12 — 463L pallet nets.



Figure 2-13 — Nets attached to 463L pallet.

A complete set of 463L pallet nets provides adequate restraint for 10,000 pounds of cargo when properly attached to the 463L pallet, with height not exceeding 96 inches above the surface of the pallet. The 463L nets will also provide adequate restraint for 8,000 pounds of cargo with heights above 96 inches (not to exceed 100 inches) above the surface of the pallet. A complete set of 463L nets weighs 65 pounds; therefore an empty pallet with nets weighs 355 pounds.

If not protected from adverse weather conditions, nets can mildew and deteriorate, and metal hooks can also rust. Therefore, hang and dry all nets after use and never store wet nets together for storage.

1.5.4 Dunnage

Always use dunnages like the ones shown in *Figure 2-14* to aid in the movement of the pallets and protect the lower surface of the pallet from damage. Dunnage, normally made of lumber or timbers, is placed under 463L pallets to prevent damage to the lower pallet surface and to aid in transportation with a forklift. The minimum dimensions of each piece of dunnage are 4 inches by 4 inches by 88 inches long. Use three pieces to support each loaded 463L pallet while on the ground.

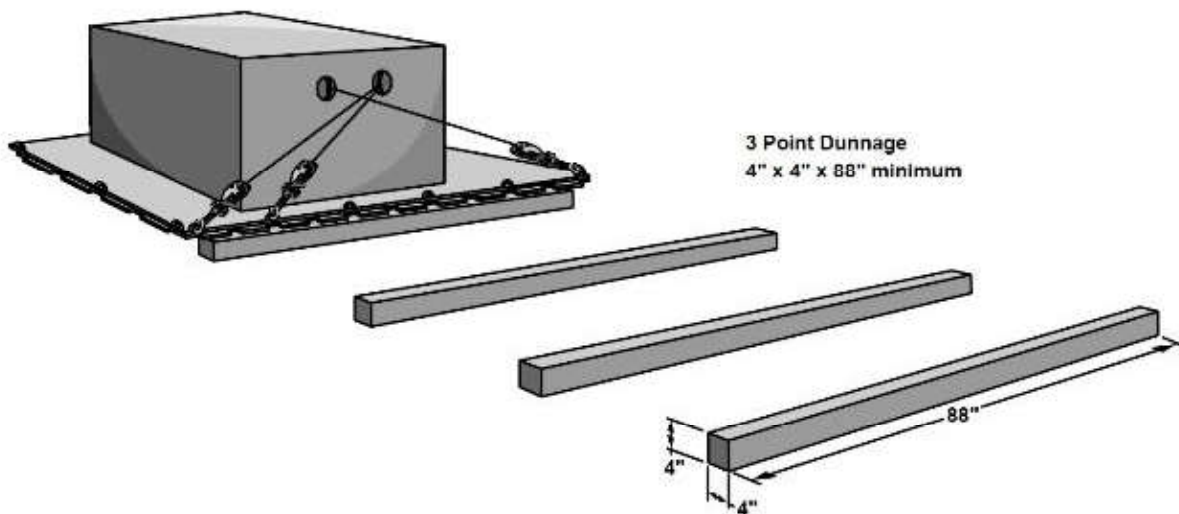


Figure 2-14 — Dunnage.

Additionally, protect the upper surface of the pallet from sharp-edged cargo. As shown in *Figure 2-15*, if the cargo has any sharp edges or protrusions, place adequate cushioning materials like dunnages between the cargo and the pallet.



Figure 2-15 — Dunnage as support and cushioning.

1.5.5 Pallet Build Up

Palletize cargo from the heaviest to the lightest. Distribute large and heavy objects evenly from the center of the pallet outward to prevent the pallet from becoming heavy on one end, as shown in *Figure 2-16*, and also to help maintain the center of balance at or near the center. Position lighter or smaller items on top of or alongside heavier cargo, as shown in *Figure 2-17*. Place containers marked “THIS SIDE UP” upright, and face cargo with special labels outward.

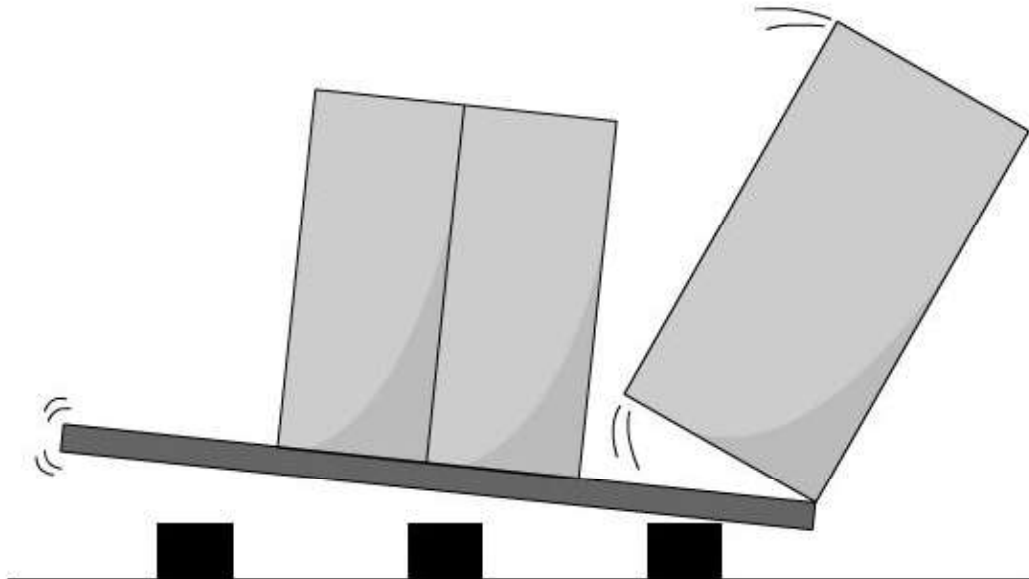


Figure 2-16 — Heavy-ended pallet.

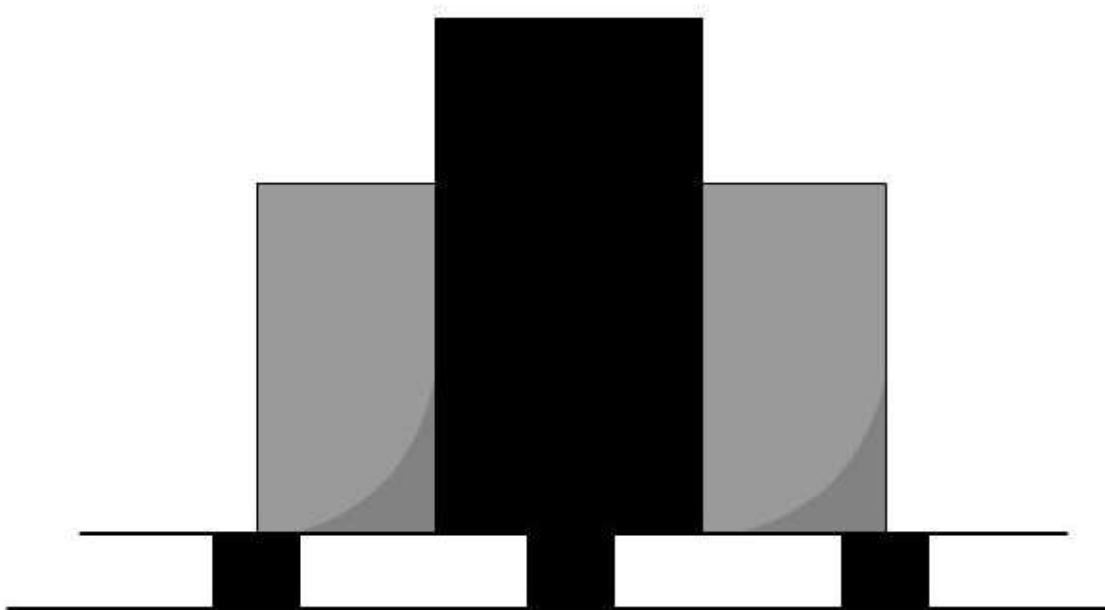


Figure 2-17 — 463L pallet cargo placement.

Whenever possible, construct pallets in a square, as shown in *Figure 2-18*, or pyramid shape, as shown in *Figure 2-19*. Do not allow cargo to extend beyond the vertical stacking line (84 by 104 inches) of single pallets. Keeping it within this area makes the load stable, easy to handle, and easier to secure on the pallet, and prevents binding in the aircraft dual rail system.

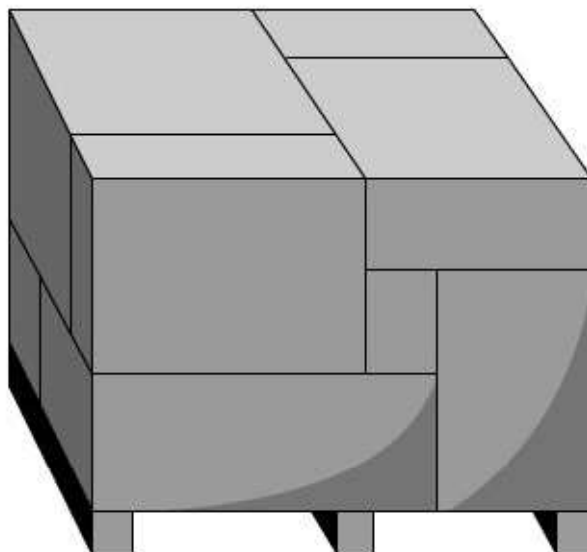


Figure 2-18 — 463L pallet cargo placement (square).

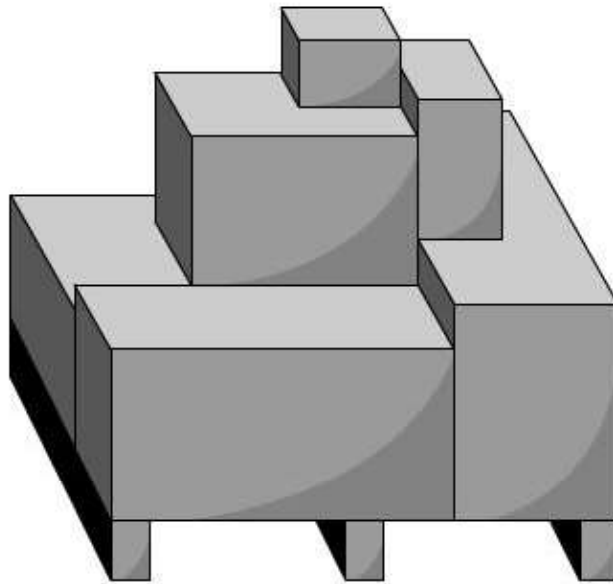


Figure 2-19 — 463L pallet cargo placement (pyramid).

NOTE

Each aircraft has size and shape restrictions that must be considered. For example, aisleways are required on pallets destined for pallet position three or four in a C-130 aircraft. Check the particular requirement on the aircraft for which the load is prepared.

1.5.6 Hazardous Materials

Hazardous materials must be palletized and handled in accordance with *Preparing Hazardous Materials for Military Air Shipments*, NAVSUP P-505. This publication requires that aircrew must have visual and physical access to all hazardous materials to mitigate any hazard posed by an in-flight incident. Additionally, all hazardous materials labels are prepared in accordance with 49 CFR 172.400 and AFMAN 24-204 requirements. The Shipper's Declaration for Dangerous Goods (*Figure 2-20*) is used for certification of hazardous material. The Special Handling Data/Certification, DD Form 1387-2 (*Figure 2-21*) is utilized for custody receipt for "special handling" materials.

SPECIAL HANDLING DATA/CERTIFICATION

1. ITEM NOMENCLATURE	2. NET QUANTITY PER PACKAGE	3. TRANSPORTATION CONTROL NO.
	4. CONSIGNMENT GROSS WEIGHT	5. DESTINATION
6. SUPPLEMENTAL INFORMATION		
This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and in proper condition for transportation according to the applicable regulations of the Dept of Transportation. THIS IS A U.S. DEPARTMENT OF DEFENSE SHIPMENT. (complete applicable blocks below)		
7. DTR REFERENCE		
8. HANDLING INSTRUCTIONS		
9. ADDRESS OF SHIPPER		10. TYPED NAME, SIGNATURE AND DATE

DD FORM 1387-2, NOC 2004

PREVIOUS EDITION IS OBSOLETE.

Form Approved OMB No. 0704-0188

Figure 2-21 — Special handling data/certification, DD form 1387-2.

1.5.7 Tie-down Techniques

There are many techniques for tying down and lashing cargo. Some of the key points to remember are the following:

- Use barriers and chain bridle, as shown in *Figure 2-22*, for loose heavy item such as lumber and pipe. The minimum thickness for the barrier is 3/4 inches (usually plywood).

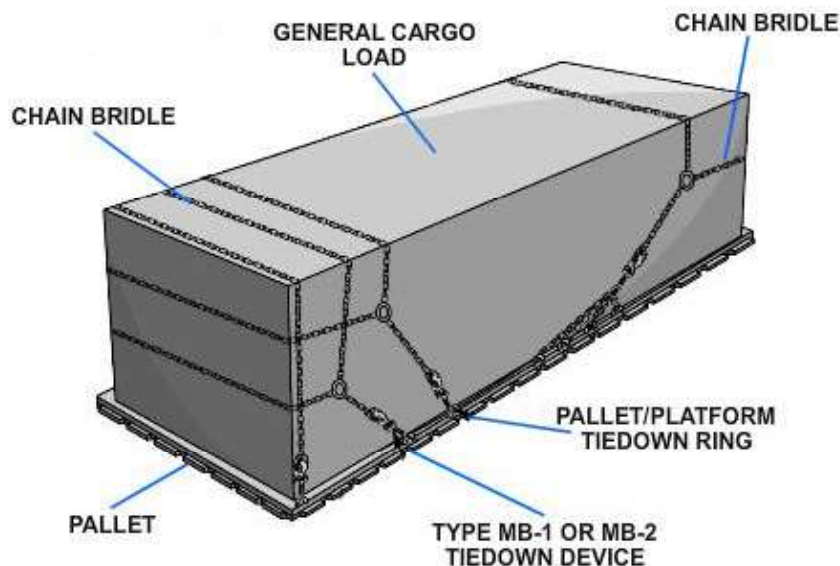


Figure 2-22 — Chain bridle.

- Use chains and MB-1 or MB-2 tie-down devices, like those shown in *Figure 2-23*, for large items such as canned engines or palletized wheeled items. MB-1 has a tie-down capacity of 10,000 pounds whereas MB-2 has a capacity of 25,000 pounds.

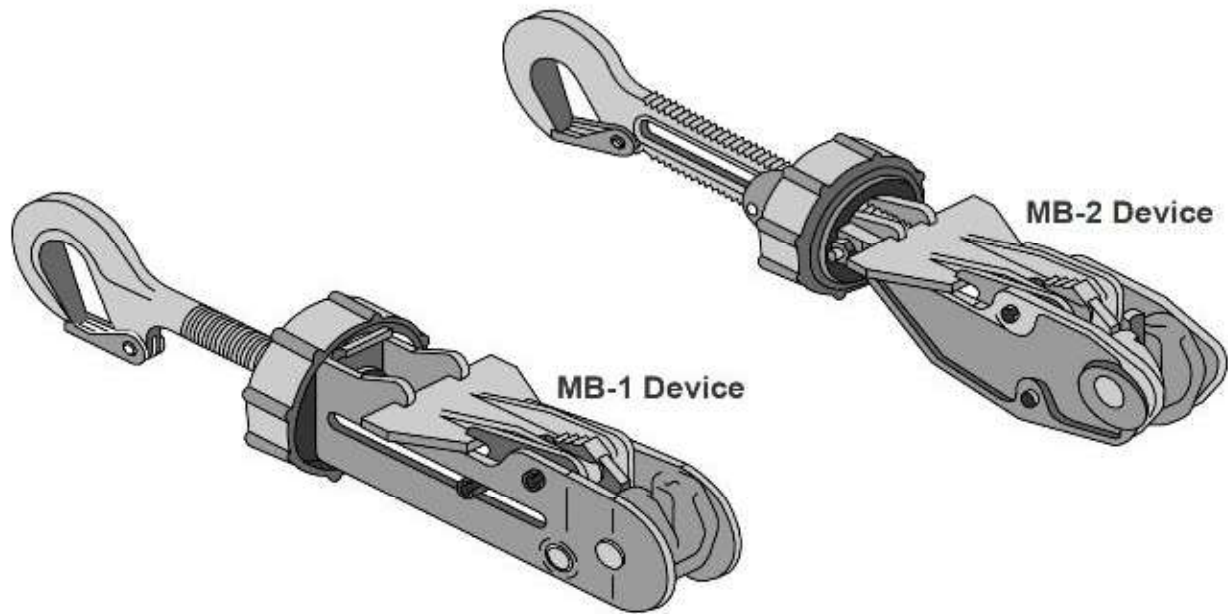


Figure 2-23 — Tie-down devices.

- Do not attach more than half of the required restraint a given direction to the axles of wheeled equipment. More than half of the required restraint applied to the axles will require the vehicle's suspension to assume the majority of resistance and could result in suspension failure or loose equipment in-flight.
- Use 463L nets for multiple loose items that fit within the usable dimension of a single 463L pallet.
- Use chains for heavy items such as large boxes (*Figure 2-24*) and vehicles.



Figure 2-24 — Chains used to tie-down large box.

- Use 5,000-pound tie-down straps, as required, to provide supplemental restraint, individual item restraint, or supplemental restraint in conjunction with 463L pallet nets. Do not use a mixture of nylon straps and metal chains to provide restraint in the same direction for the same piece of cargo. The nylon can stretch, forcing the metal chain to assume the entire applied load, and could result in chain failure.

1.5.8 Forklifts

Handling and loading 463L pallets with a forklift requires the use of fork extensions (tine fork extenders) in order to support the weight and size of the pallet fully. Technical publications that govern loading procedures for aircraft require forklift tines be a minimum of 72 inches in length.

Tine extenders are designed in two configurations: bare tine extenders, shown in *Figure 2-25*, and rollerized tine extenders, shown in *Figure 2-26*. The rollerized version of tine extenders is best suited for the rapid handling of 463L pallets, while the bare tine extenders are more useful in pallet building and the placement of mobile loads on beds of vehicles. Either type of extender is acceptable and can be locally manufactured; however, extreme care must be exercised when handling 463L pallets, because the tine tips can easily damage a pallet surface and render it unusable. To allow for unloading aircraft and handling pallets at the campsite, the Equipment Supervisor must ensure a set of tine fork extensions are embarked with the cargo and CESE. The 12K Lift King forklift currently assigned to the NCF TOA has a set of roller tine fork extensions assigned as an attachment.

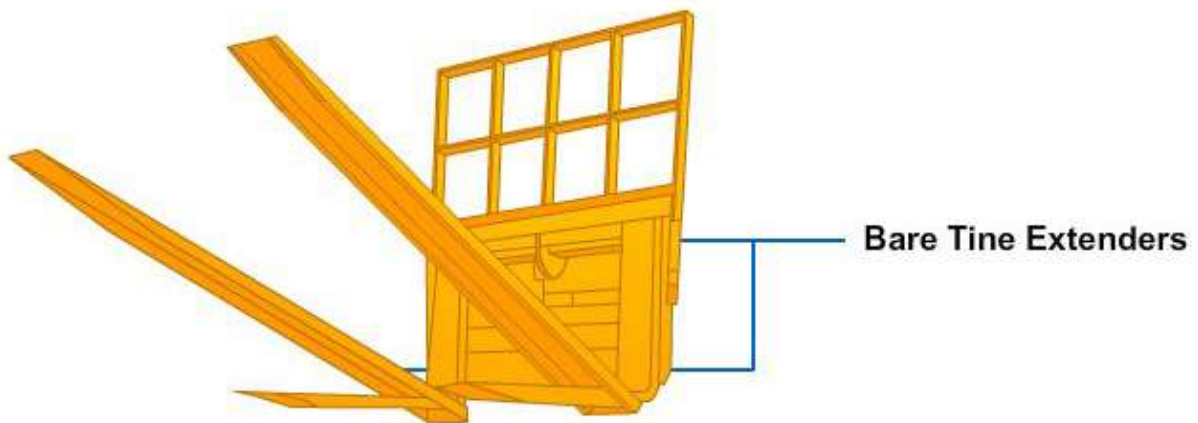


Figure 2-25 — Bare tine extenders.

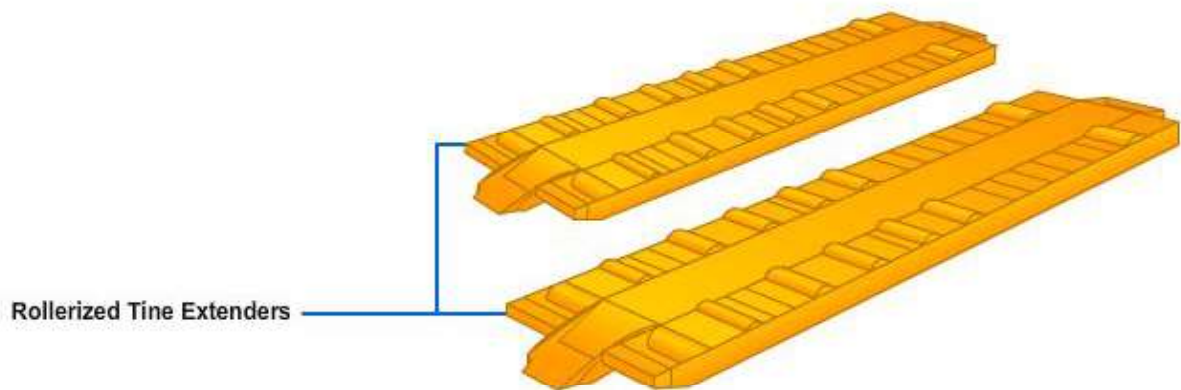


Figure 2-26 — Rollerized tine extenders.

Test your Knowledge (Select the Correct Response)

6. The 463L system can reduce ground times by as much as _____ percent.
- A. 85
 - B. 80
 - C. 75
 - D. 70
7. **(True or False)** The dual rail system is permanently installed in most aircrafts used by the NCF.
- A. True
 - B. False

1.6.0 Weighing and Marking

Airlift aircrafts will accept only items of cargo marked with proper weight and center of balance. Cargo improperly weighed or marked could cause an unsafe flight condition, putting the mission in jeopardy; therefore members of the Air Det must be highly qualified in both vehicle and cargo weighing and marking procedures. Furthermore, not only are they responsible for weighing and marking items prior to being airlifted to Det location, but they are also responsible for doing so upon completion of the mission when mounting out to return home.

1.6.1 Portable Scales

Portable scales, like the one shown in *Figure 2-27*, are commonly used at airlift field, marshalling, and inspection areas to weigh vehicles and pallets. Portable scales are capable of weighing cargo up to 20,000 pounds per scale. Although normally used in multiples of four, a minimum of two scales can be used.

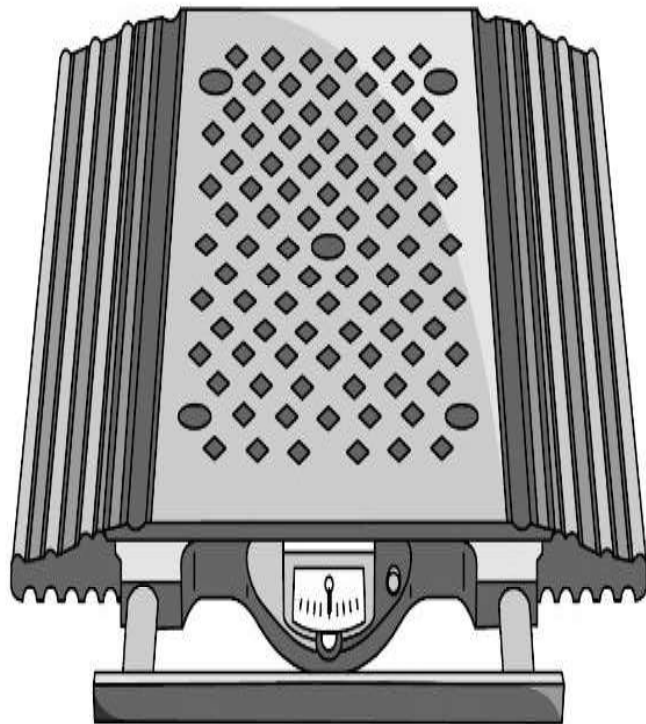


Figure 2-27 — Portable scale.

1.6.2 Weighing Vehicles

If only two portable scales are available, use the following procedures for weighing vehicles:

- Place the scales in front of the tires of the first axle.
- Drive the vehicle onto the scales.
- With the operator out of the vehicle and the tires centered evenly on the scales, as shown in *Figure 2-28*, record the weight over the appropriate axle.
- To determine the axle weight, combine both weights (right and left side).
- Continue the process until all axles are weighed.



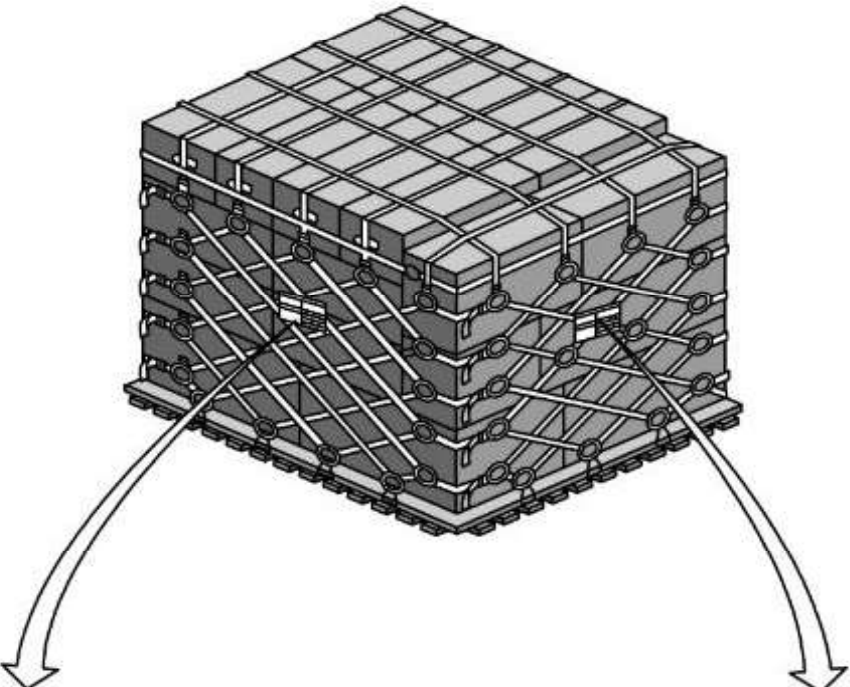
Figure 2-28 — Tire centered evenly on scale.

1.6.3 Weighing Pallets

Each 463L pallet built must be weighed and the scale weight must be recorded on all copies of the manifest. Use the following procedures for weighing a loaded pallet:

- Place the loaded pallet with dunnage pieces evenly on two portable scales.
- Add the two scale weights together to get the pallet gross weight.

The Pallet Identifier, DD Form 2775 (*Figure 2-29*) annotates the required information for cargo documentation and identifies all completed 462L pallets/trains loaded with cargo. After weighing a pallet, prepare two copies of the DD Forms 2775, place them inside the interlocking closure plastic bags, and attach one to the upper left-hand corner on one 88-inch side and the other on one 108-inch side. Entries on this form include the numbers of straps, chains, tie-down devices and net sets, as well as the pallet's gross weight and the name of the person who performed the weighing of the pallet.



The diagram shows a 3D perspective of a pallet loaded with a grid of boxes. Two curved arrows originate from the pallet: one points to the '1. PALLET IDENTIFICATION NUMBER' field, and the other points to the '7. MISCELLANEOUS INFORMATION/THIS PALLET CONTAINS:' field.

PALLET IDENTIFIER			
1. PALLET IDENTIFICATION NUMBER		2. AIRCRAFT CONFIGURATION	
3. ORIGINATING STATION		4. DESTINATION STATION	
5. NET WEIGHT (Lbs.)		6a. STRAPS	6b. CHAINS
		6c. DEVICES	6d. NET SETS
7. MISCELLANEOUS INFORMATION/THIS PALLET CONTAINS:		8. GROSS WEIGHT (Lbs.)	
		9. SCALE WEIGHT CERTIFICATION	
		a. NAME	b. GRADE
		c. DATE (YYYYMMDD)	
CARGO		10. CUBE THIS PALLET	

DD FORM 2775, SEP 1998 (EG) REPLACES AF FORM 2279, MAY 84 Designed using Perform Pro, WHS/DIOR, Sep 98

Figure 2-29 — Pallet Identifier, DD Form 2775.

NOTE

Once pallets are weighed and marked, do not add or remove any items of cargo. Any additions or deletions will require the cargo to be weighed and marked again.

1.7.0 Center of Balance

1.7.1 Calculation Terms

An understanding of the following terms and abbreviation is necessary for calculating the center of balance:

- Reference line (RL) is a line from which all measurements are taken. Normally, the RL is established at the forward front edge of a vehicle, as shown in *Figure 2-30*. Once it has been established, do not change it.

REFERENCE LINE

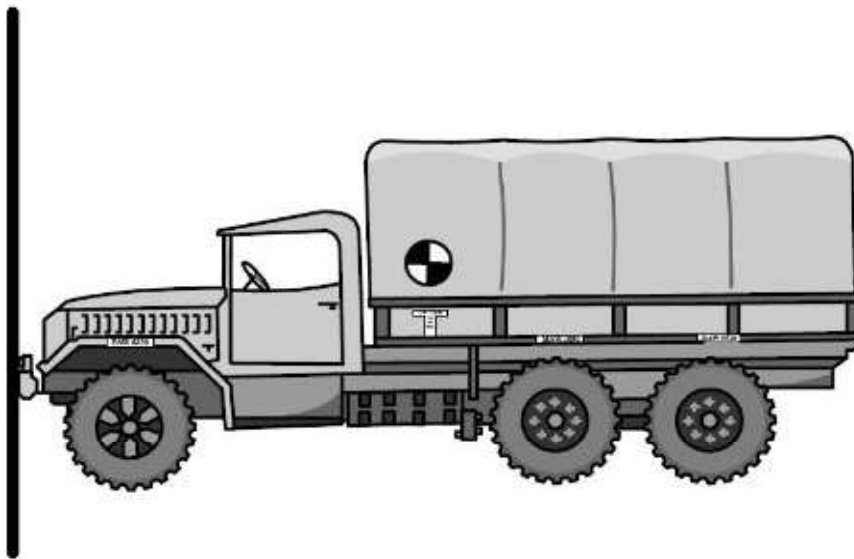


Figure 2-30 — Reference line.

- Center of balance (CB) is the point of balance of a piece of cargo, as shown in *Figure 2-31*.

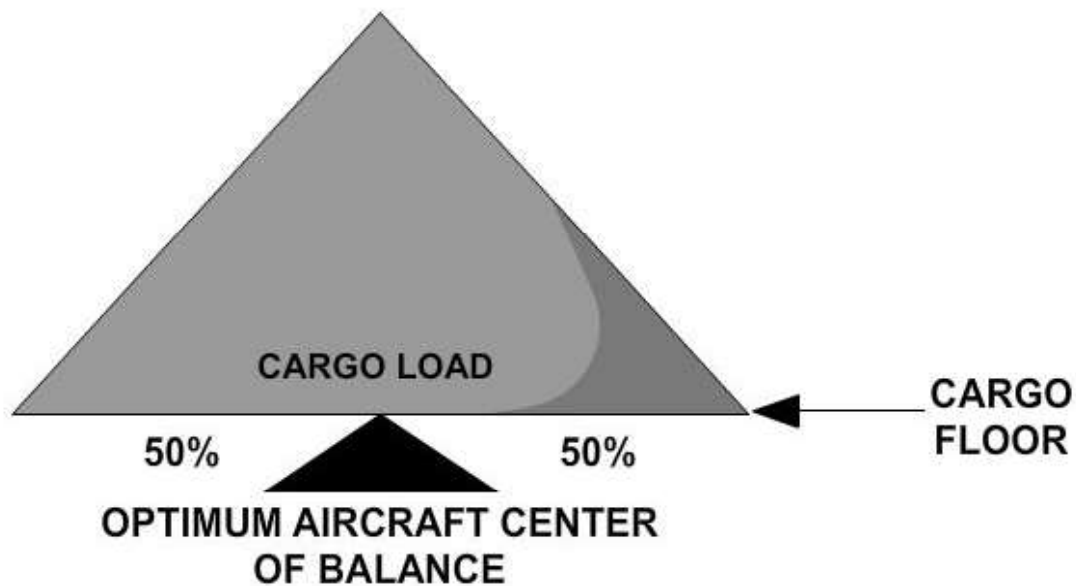


Figure 2-31 — Center of balance model.

- Gross weight (GW) is the total weight of an item of cargo, including all secondary cargo.
- Weight one (W1) is used in computing the CB. It defines the first weight contacting the floor from the RL (*Figure 2-32*).
- Weight two (W2) is used in computing the CB. It defines the second weight contacting the floor from the RL (*Figure 2-32*).

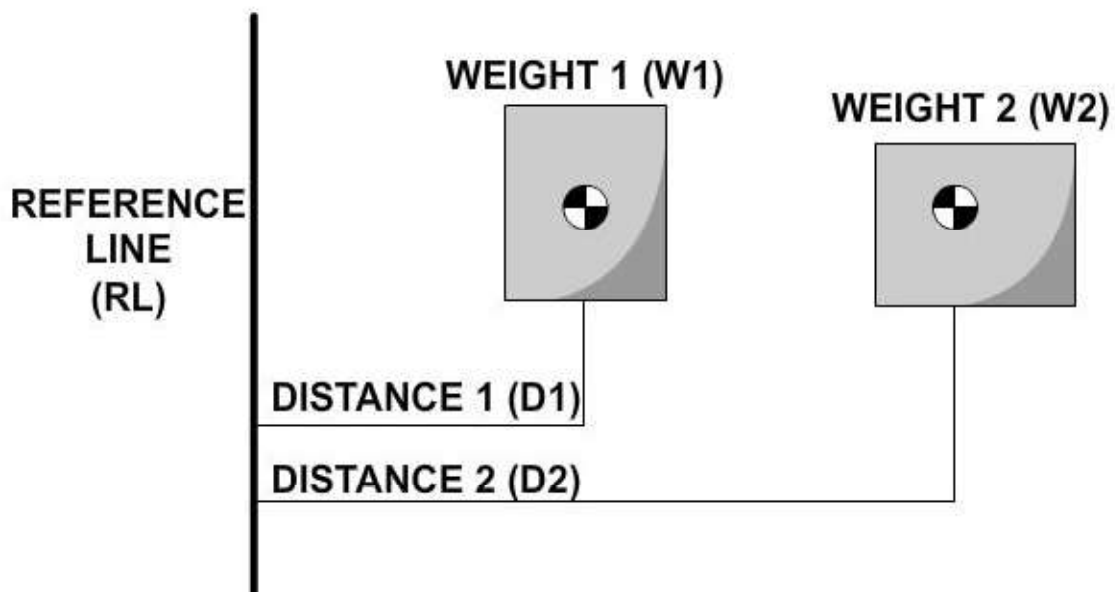


Figure 2-32 — Center of balance model (W1, W2).

- Weight three, weight four, and weight five (W3, W4, and W5) are terms used to define subsequent weight after W1 and W2 (*Figure 2-33*).

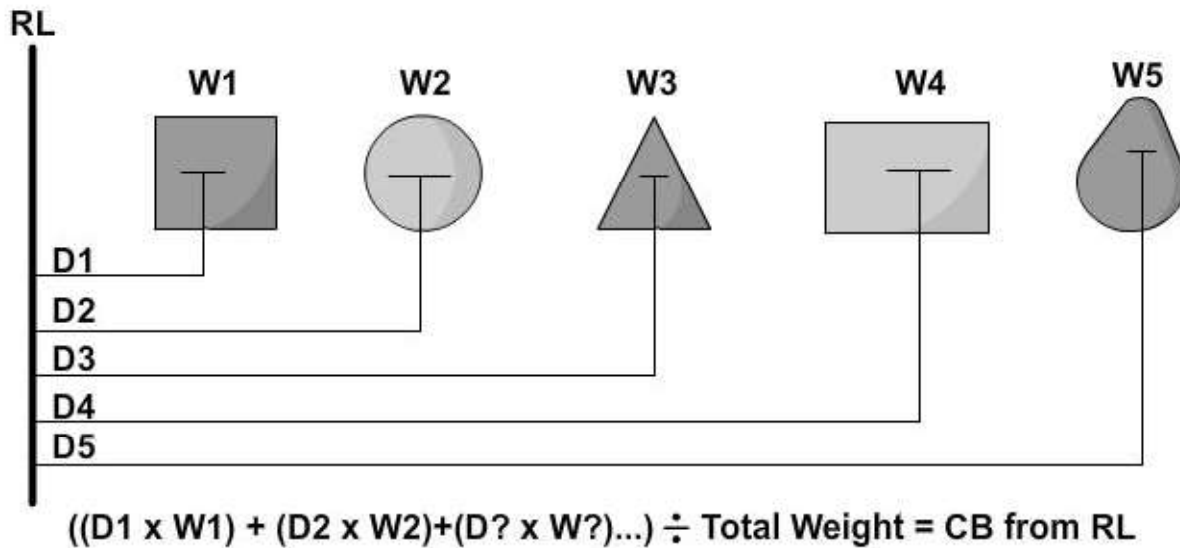


Figure 2-33 — Center of balance model (W3 through W5).

- Distance one (D1) is the distance from RL to W1, as shown earlier in *Figure 2-32*, measured in inches.
- Distance two (D2) is the distance from RL to W2, as shown earlier in *Figure 2-32*, measured in inches.
- Distance three, distance four, and distance five (D3, D4, and D5) are the subsequent distances, always measured in inches, from the RL to the appropriate weights.
- Moment (M) is the product obtained by multiplying weight in pounds by distance in inches from the RL.

1.7.2 Center of Balance Criteria

Marking the CB is not necessary on individual 463L pallets. If 463L pallets are built correctly, the CB will be at or near the center. However, the CB must be marked on married pallets or pallet train, as shown in *Figure 2-34*.

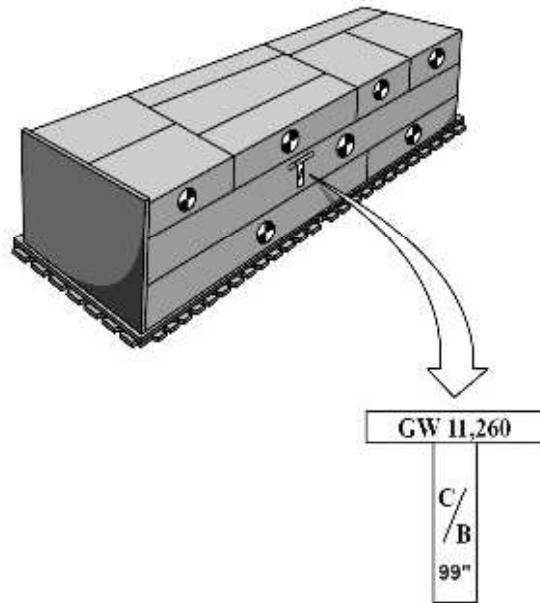


Figure 2-34 — CB markings on married pallets.

Mark the CB on all items of cargo that meet the following criteria:

- All vehicles
- Any item of cargo 10 feet or longer
- Any item with a CB at a point other than its center

1.7.3 Determining the Center of Balance of Tracked Vehicles or Long Non-Wheeled Items

When a large enough scale is not available to weigh the entire vehicle, the CB can be determined by driving the tracked vehicle onto a wood beam, as shown in *Figure 2-35*, until it tilts forward. Mark the side of the vehicle at the point of tilt.

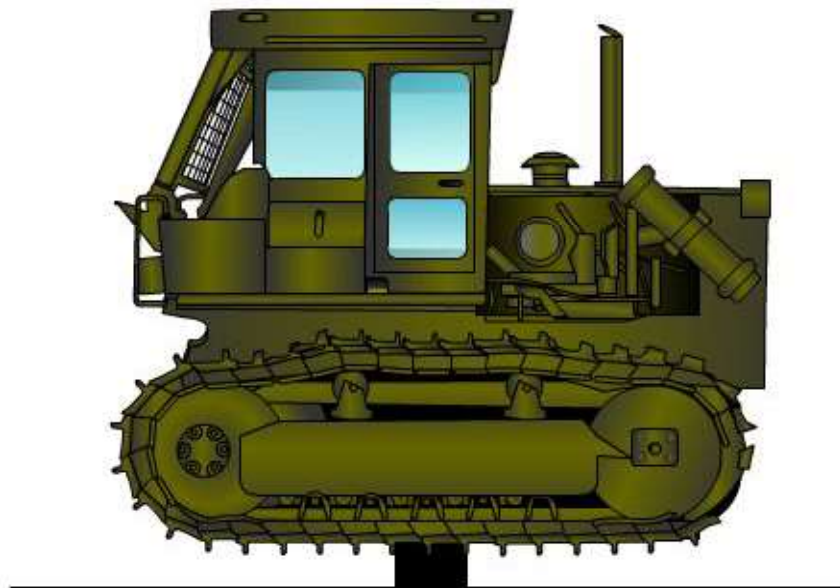


Figure 2-35 — Determining the center of balance of tracked vehicles.

1.7.4 Determining the Center of Balance of Wheeled Items

Use the basic weight and balance formula shown below to compute the CB of wheeled items.

$$\text{Weight} \times \text{Distance} = \text{Moment}$$

$$\text{Moment} \div \text{Distance} = \text{Weight}$$

$$\text{Moment} \div \text{Weight} = \text{CB (Distance)}$$

$$\text{Total Moment} \div \text{Total Weight} = \text{CB (Distance)}$$

Figure 2-36 shows the formula for determining CB of wheeled items.

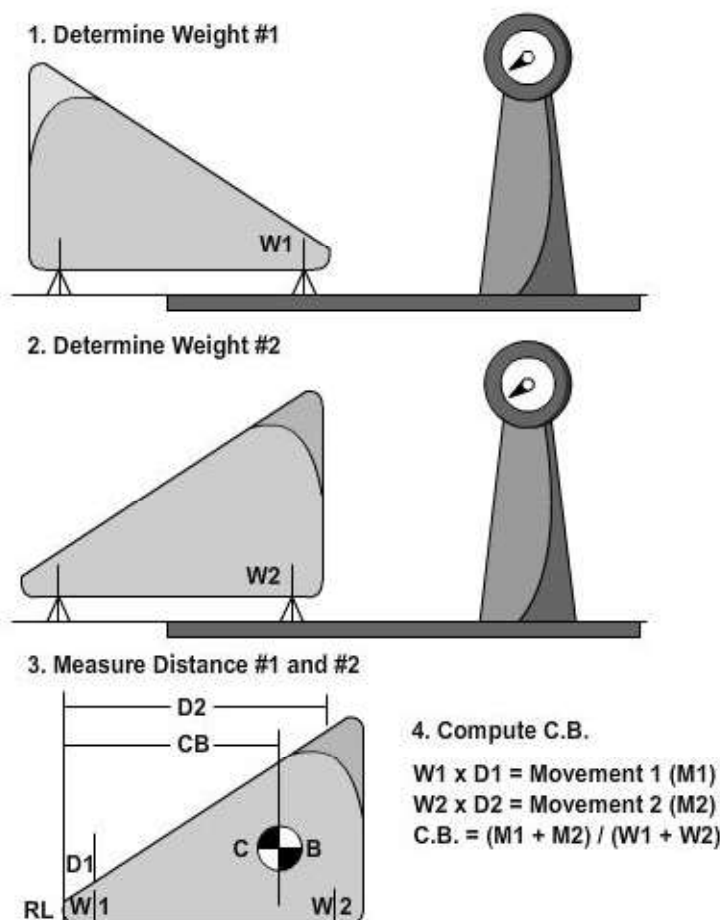


Figure 2-36 — Determining center balance of wheeled items.

NOTE

Round decimals to the nearest whole number.

1.7.5 Marking Procedures

Figure 2-37 shows proper vehicle markings. After determining the CB of the vehicle, mark its location and GW on both sides of the vehicle using a grease pencil/magic marker and weather-resistant masking tape, forming the letter “T”. The horizontal portion of the “T” will contain the GW information, and the vertical portion of the “T” will contain the letters “CB” to indicate the exact position of the vehicle’s CB. Also included is the distance in inches from the RL to the CB location. This measurement is referred to as “from forward end” and is abbreviated “FFE”.

Additionally, on both sides of the vehicle, mark axle weights above each axle. Use the abbreviation “FAW” for front axle weight, “MAW” for middle axle weight, and “RAW” for rear axle weight.

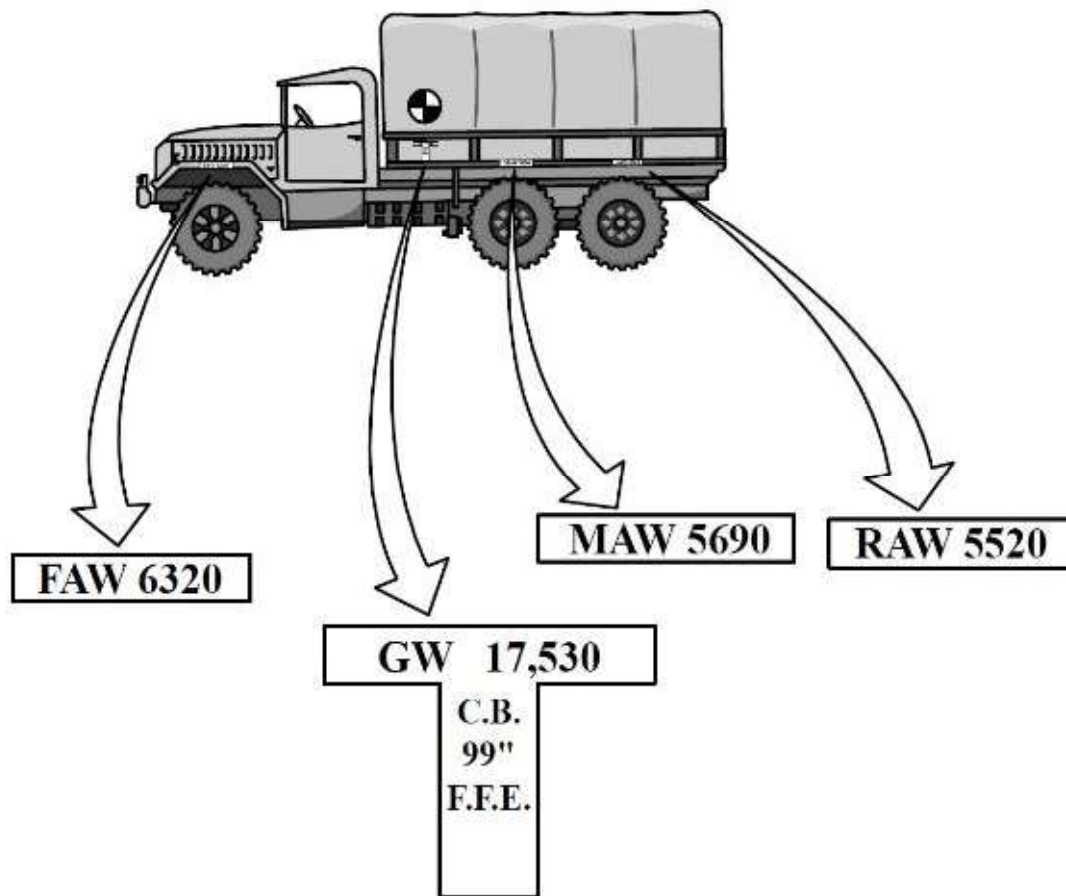


Figure 2-37 — Marking procedures.

Test your Knowledge (Select the Correct Response)

8. (True or False) Airlift aircrafts will accept only items of cargo with the proper weight and center of balance marked.
 - A. True
 - B. False
9. Portable scales are capable of weighing cargo up to _____ pounds per scale.
 - A. 35,000
 - B. 30,000
 - C. 25,000
 - D. 20,000

1.8.0 Shoring

The Air Det is responsible for providing shoring. Shoring serves many purposes. It protects the aircraft cargo floor and the 463L pallet surfaces. It decreases the approach angle of the aircraft cargo ramps, protects aircraft parking ramps, and increases cargo contact areas.

1.8.1 Load Spreading

Load spreading is a physical process that distributes a concentrated weight over a large area. This weight exerts a certain amount of pressure, determined by its supporting contact area. By using shoring, the contact area can be increased at a 45-degree angle from the upper surface of the shoring to the cargo floor. This increased contact area decreases the pressure on the floor, allowing the aircraft to carry an otherwise prohibited piece of cargo. It is important to note that shoring will increase the area of contact only by an amount approximately equal to the shoring thickness on all sides of the object it supports. It will not increase the pounds per square inch (psi) limitations.

1.8.2 Shoring Categories

There are four categories of shoring: rolling, parking, sleeping, and approach. Each category has its own specification, requirements, and applications.

Rolling Shoring – Rolling shoring, as shown in *Figure 2-38*, protects airport parking ramps and the cargo floor or loading ramps of cargo aircraft. It is required for tracked equipment and all other vehicles with gripping devices or treads that allow concentrated contact. Such contact can easily cause damage to the aircraft floor. To prevent damage, the minimum thickness required of rolling shoring is 3/4 inch.

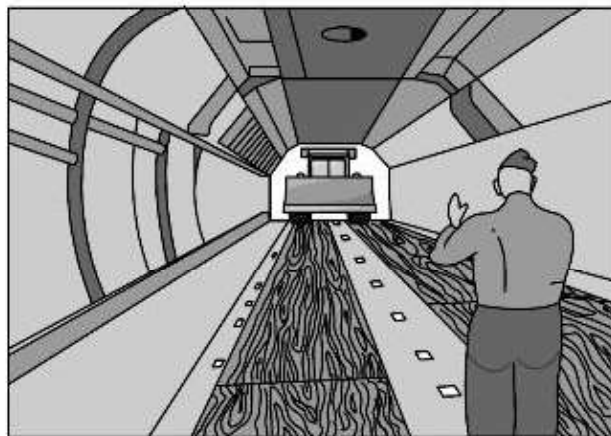
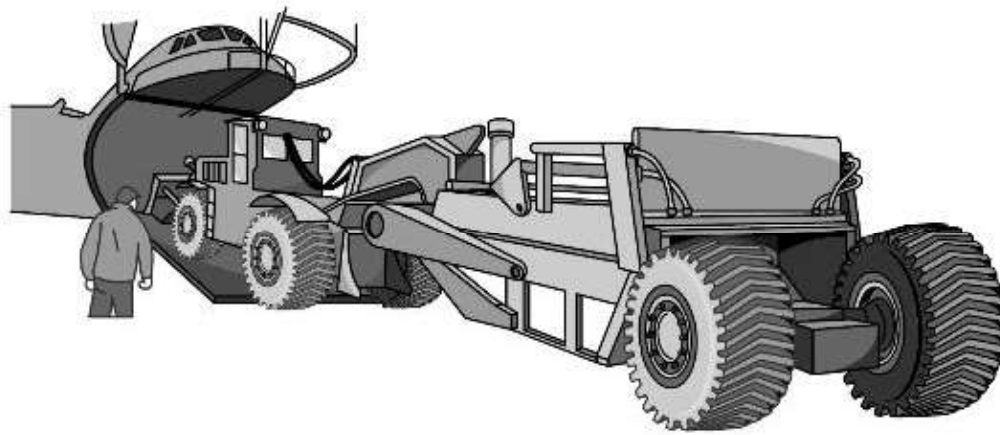


Figure 2-38 — Rolling shoring.

Parking Shoring – Parking shoring, as shown in *Figure 2-39*, is used to protect the aircraft floor from damage during flight. Any equipment or vehicle requiring rolling shoring also requires parking shoring. Each aircraft has specific floor weight limitations that apply to wheeled and non-wheeled items of cargo. If the vehicle exceeds these weight limitations, parking shoring must be provided before the item can be transported by air. When you are planning an airlift, here are some general considerations to remember regarding parking shoring.

- The minimum thickness of parking shoring is 3/4 inch.
- Use parking shoring to protect the aircraft floor or ramps from contact from blades, buckets, fork-lift tines, steel wheels, trailer tongue supports. All trailers with a tongue that could rest on the aircraft floor should be shipped with parking shoring, whether connected or disconnected from its prime mover.
- Most pneumatic tires do not normally require parking shoring. The ones that do are usually narrow and/or very heavy.
- Always use parking shoring when rolling shoring is used.
- Always use parking shoring on 463L pallets when loading items that have sharp edges or protrusions that could damage the pallet's aluminum surface.

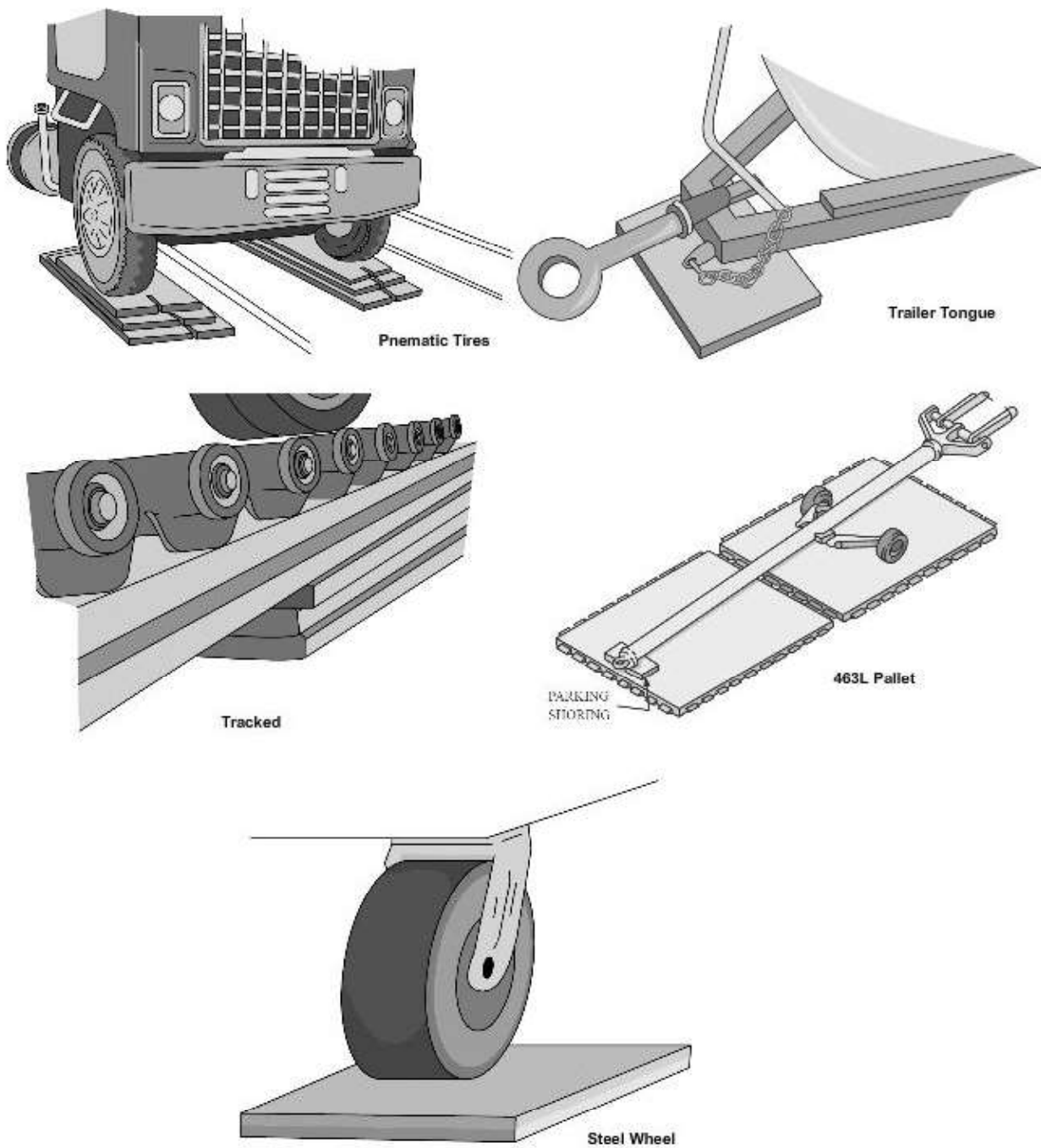


Figure 2-39 — Parking shoring.

Sleeping Shoring – Sleeping shoring, as shown in *Figure 2-40*, is used under the frame or axles of vehicles that weigh over 20,000 pounds and are equipped with soft, low pressure, balloon-type, off-road tires. It prevents the vehicle from bouncing up and down and possibility pulling the tie-down rings out of the aircraft floor (*Figure 2-40, View A*). The base of the sleep shoring (area contacting the aircraft floor) must be large enough to support the entire weight of the vehicle it is beneath without exceeding the psi limitation of the aircraft floor (*Figure 2-40, View B*).

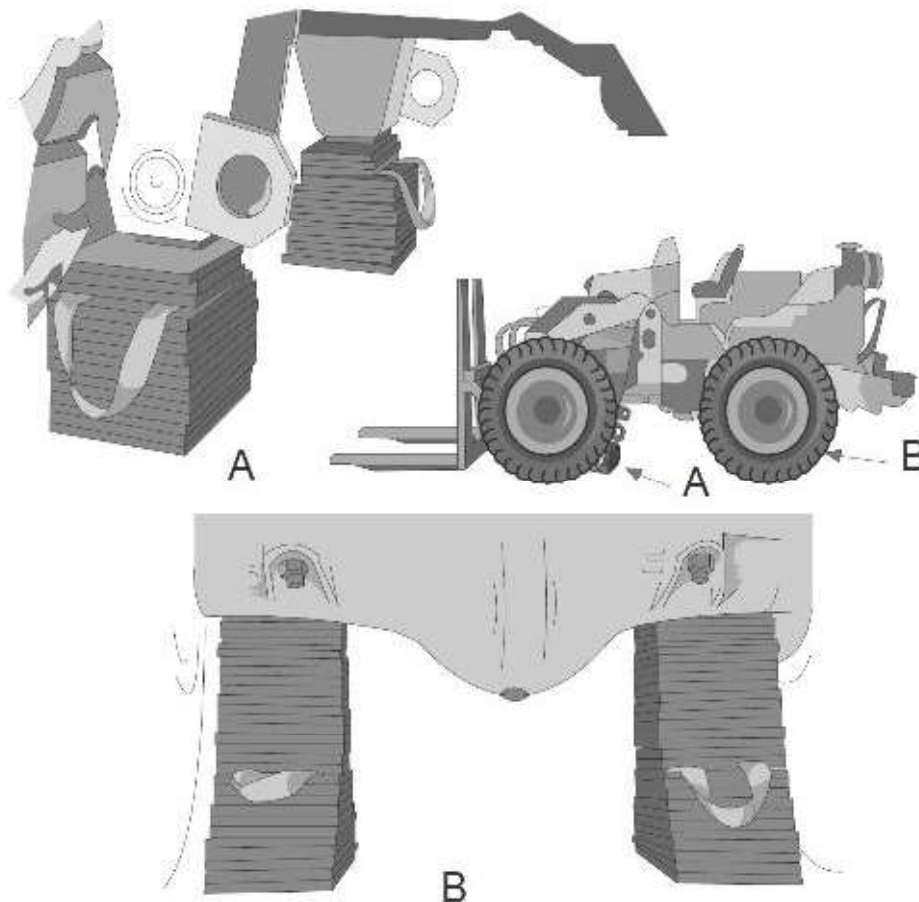


Figure 2-40 — Sleeping shoring.

Approach Shoring – Approach shoring, as shown in *Figure 2-41*, is used to decrease the approach angle of the aircraft loading ramps. This is because some items of cargo will strike the aircraft or ground during loading and offloading operations. Extremely tall and long items may also contact the top of the aircraft cargo compartment without a reduced approach angle provided by approach shoring. Although there is no standard method to calculate when and how much approach shoring is used, many long vehicles with limited ground clearance, such as low-boy trailers, will require approach shoring.



Figure 2-41 — Approach shoring.

The Air Det must maintain custody of all shoring throughout the mission. Shoring should not be used as tent flooring, tables, or chairs. Shoring can be easily misplaced and should be stored off the ground in one location to prevent insect infestation, rot, or theft. The horizontal construction platoon should account for all shoring assigned to each piece of CESE because this shoring will be required for additional airlift plans.

Test your Knowledge (Select the Correct Response)

10. Which is NOT a purpose of shoring?
 - A. To protect the aircraft cargo floor
 - B. To protect 463L pallet surfaces
 - C. To decrease the approach angle of the aircraft cargo ramps
 - D. To increase cargo space

11. **(True or False)** There are five categories of shoring.
 - A. True
 - B. False

1.9.0 Joint Inspection

While the Air Det is responsible for setting up the movement precedence and cargo preparation, TALCE or MSTs are responsible for approving all aircraft lifts, supervising the loading, offloading, and tie-down of vehicles and cargo as well as ensuring

compliance with aircraft loading manuals. Due to joint responsibilities, it is necessary to accomplish and document final inspections of equipment before loading. Qualified representatives from the Air Det, Departure Airlift Control Group (DACG)/Mobility Control Center (MCC), and the supporting airlift representative will perform a joint inspection of aircraft loads.

1.9.1 Operator Assignments

Once the CESE list has been established, the Equipment Supervisor must assign operators and co-drivers. Operators must stand by their assigned CESE that has been prepared and staged at the marshaling area for the joint inspection.

They are also required to accompany the assigned CESE throughout the transport to the mission site.

The marshaling and staging area is where equipment and materials are received. CESE is inspected for cleanliness and fluid leaks, mobile loads are completed, vehicles are weighed and marked for center of balance, cargo is palletized on the Air Force 463L cargo pallets, and cargo and CESE are placed into a configuration (chalk) for each aircraft (*Figure 2-42*).

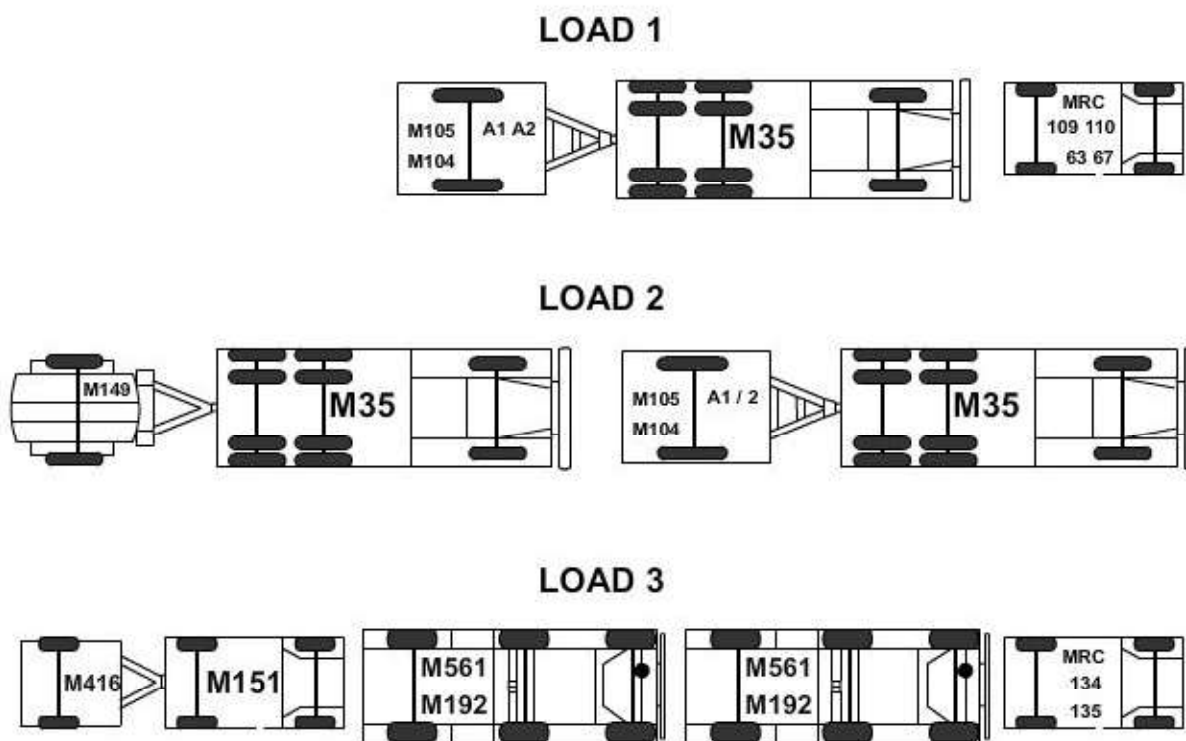


Figure 2-42 — Marshaling for 130.

1.9.2 Joint Airlift Inspection Record, DD Form 2133

Joint Airlift Inspection Record, DD Form 2133 (*Figure 2-43*), is used as the final joint inspection document. It is also used to annotate that hazardous materials have been inspected and all associated hazardous material paperwork is completed prior to passing the Joint Inspection. *AMC Affiliation Workbook 36-101 Volume 1 Equipment Preparation Course* provides instructions for completing this form. Three copies are completed for each aircraft load and signed by the appropriate transported force and supporting airlift personnel. A copy is attached to the aircraft cargo manifest, one is given to the TALCE or MTS, and another one is given to the Air Det.

JOINT AIRLIFT INSPECTION RECORD (See Instructions on back.)							PAGE	OF	PAGES	
1. UNIT BEING AIRLIFTED				2. DEPARTURE AIRFIELD			3. DATE (YYYYMMDD)			
4. AIRCRAFT TYPE AND MISSION NUMBER				5. LOAD/CHALK NO.		6. START TIME		7. COMPLETE TIME		
								8. TALCE/CDF		
LEGEND (Mark blocks after each item as follows)				INCREMENT/SERIAL/BUMPER NUMBER AND TYPE						
✓ = SATISFACTORY X = UNSATISFACTORY IF NOT APPLICABLE, LEAVE BLANK										
A. DOCUMENTATION										
9. MANIFESTS/LOAD PLANS										
10. SHIPPERS DECLARATION										
11. HAZARDOUS MATERIALS PREPARATION										
12. LOAD LISTS/CARGO TRANSFER FORMS										
B. VEHICLES/NON-POWERED EQUIPMENT										
13. CLEAN										
14. FLUID LEAKS										
15. MECHANICAL CONDITION										
a. ENGINE RUNS										
b. BRAKES OPERATIONAL										
16. BATTERY										
a. SECURE - NO LEAKS										
b. POST/CABLES-PROTECTED										
17. FUEL TANK(S) LEVELS										
a. AS REQUIRED(S)										
b. FUEL TANK CAPS INSTALLED										
18. JERRY CANS										
a. DOR 5L (Metal)										
b. POP (Plastic)										
19. DIMENSIONS (Fits A/C Profile or Condition)										
20. CENTER OF BALANCE (Both Sides)										
21. SCALE WEIGHT (Both Sides)										
22. AXLE WEIGHTS (Both Sides)										
23. TIEDOWN POINTS (Serviceable)										
24. PINTLE HOOKS/CLEAVES										
a. SERVICEABLE										
b. SAFETY PIN ATTACHED (Safety Chains)										
25. VEHICLE EQUIPMENT SECURE (Tools, tires, etc.)										
26. TIRE PRESSURE										
27. SHORING (Rolling, Parking, Slinger, Approach)										
28. ACCOMPANYING LOAD										
a. WITHIN VEHICLE RATED CAPACITY										
b. SECURE TO VEHICLE										
29. LOX/NITROGEN CART (Vent Kit)										
C. PALLETS/PALLET TRAINS										
30. CLEAN										
31. SCALE WEIGHT										
32. DIMENSIONS (Fits A/C Profile or Contour)										
33. CARGO PROPERLY SECURED										
a. NETTED										
b. CHAINED/STRAPPED										
34. DUNNAGE (3 Pieces Per Pallet)										
D. HELICOPTERS (Flyaway)										
35. FUEL QUANTITY (Gallons)										
36. BATTERY (Disconnected/Taped)										
37. CENTER OF BALANCE (Both Sides)										
38. SCALE WEIGHT (Both Sides)										
39. SHORING (Rolling, Parking, Approach)										
40. SPECIAL LOADING EQUIPMENT (Towbars, etc.)										
41. REMARKS										
THE ABOVE LISTED ITEMS HAVE BEEN INSPECTED FOR PROPER SHIPPING CONFIGURATION.										
42. DEPLOYING FORCWE REPRESENTATIVE (Signature/Rank/Unit of Assignment)					43. MOBILITY FORCE INSPECTOR (Signature/Rank/Unit of Assignment)					

DD FORM 2133, OCT 1998

PREVIOUS EDITION IS OBSOLETE.

Figure 2-43 — Joint Airlift inspection record, DD form 2133.

Test your Knowledge (Select the Correct Response)

12. (True or False) Shoring can be used as tent flooring, tables and chairs
- A. True
 - B. False
13. What form is used as the final joint inspection document?
- A. DD Form 2133
 - B. DD Form 2131
 - C. DD Form 2130
 - D. DD Form 1385

1.10.0 Aircraft Weight and Balance

A basic working knowledge of aircraft weight and balance is vital to the airlift planner. Without this knowledge, flight safety is jeopardized and any further airlift planning is meaningless. Airlift is a scarce commodity and must be used efficiently.

1.10.1 Aircraft Center of Balance

CB is the point where the aircraft balances. Aircraft flight performance depends on the proper location of this point. If the CB is not within the allowable range, the aircraft will not fly properly. Additionally, as fuel, cargo, and other weights are added, burned off, or relocated within the aircraft, the CB will change. The aircraft's design permits such changes provided the CB location remains within certain specified limits. An empty aircraft is always in balance, regardless of the amount of fuel on board. When adding a cargo load, weight and balance become a concern. Each aircraft has a specified forward and aft limitation that must not be exceeded to ensure the aircraft is safely balanced for flight. These limits vary according to the gross weight of the aircraft. The only way to assure a safely balanced aircraft is to know how to find the CB of a load and to determine if it will fall in the proper location of the aircraft.

1.10.2 Fuselage Stations

Computing the CB of an aircraft is similar to the process used for vehicles. A new term must be defined first.

- Fuselage stations (FS) are measurements in inches from the RL to those specific points in the aircraft. A number on the wall of an aircraft identifies these stations.

1.10.3 Center of Balance Range

By moving cargo in relation to the aircraft CB, the balance of the aircraft can be adjusted. The load planner's job is to make sure the load center of balance is within the aircraft center of balance range. To determine the center of balance range, add the total cargo and passenger weight for each aircraft load. Enter the "Cabin Load" column in *Table 2-2* and track down the column vertically until reaching the range that the weight falls within. Follow the line horizontally across until you are in the vertical column for the type aircraft. The two numbers present the CB range. The load center of balance must be between these two numbers.

**Table 2-2 — Cargo load center of balance range
(fuselage station range for variable cabin loads).**

CABIN LOAD	C-130 E/H	C-5	C-17
	(Note 1)		(Note 2)
0-5,000	400-550	400-1000 (1000)	630-1000
5,001-10,000	400-550	400-1000 (1000)	770-1000
10,001-15,000	475-530	400-1000 (1000)	770-1000
15,001-20,000	485-530	400-1370 (1040)	835-970
20,001-25,000	485-530	400-1370 (1040)	835-970
25,001-30,000	510-530	670-1380 (1153)	860-960
30,001-40,000	510-530	835-1380 (1207)	870-950
40,001-50,000		935-1380 (1242)	880-950
50,001-60,000		1000-1380 (1265)	890-950
60,001-70,000		1050-1389 (1280)	890-940
70,001-80,000		1085-1390 (1293)	
80,001-90,000		1115-1390 (1309)	
90,001-100,000		1135-1390 (1320)	
100,001-120,000		1170-1390 (1324)	
120,001-150,000		1200-1390 (1332)	
150,001-175,000		1225-1390 (1338)	
175,001-245,000		1280-1390 (1345)	
245,001-291,000		1315-1390 (1350)	
Note 1: C-130 CB window for Kevlar equipped aircraft is fuselage station 550-575. Use the above figures for aircraft not equipped with Kevlar.			
Note 2: Plan to place average cargo CB location as near the fuselage station in parentheses as possible for preferred optimum fuel efficiency.			

1.10.4 Weight and Balance Theories

There are two common weight and balance theories: “Pyramid Loading” and the “50-50 Loading” methods. These two theories can be applied when adjusting the balance of an aircraft. It is a matter of moving cargo in relation to the aircraft fulcrum.

Pyramid Loading Method – The pyramid loading method, shown in *Figure 2-44*, places the heaviest cargo item over the optimum load center of balance. Lighter items are placed in the front of and in the back of the heaviest item.

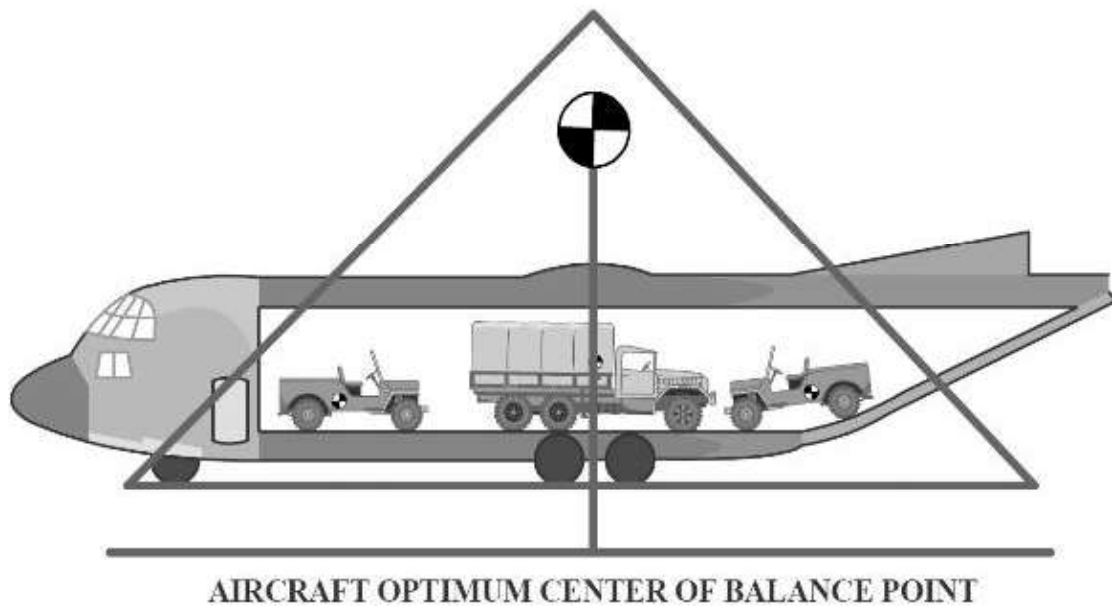


Figure 2-44 — Pyramid loading method.

50-50 Loading Method – The 50-50 loading method, shown in *Figure 2-45*, places 50 percent of cargo on either side of the optimum cargo load center of balance.

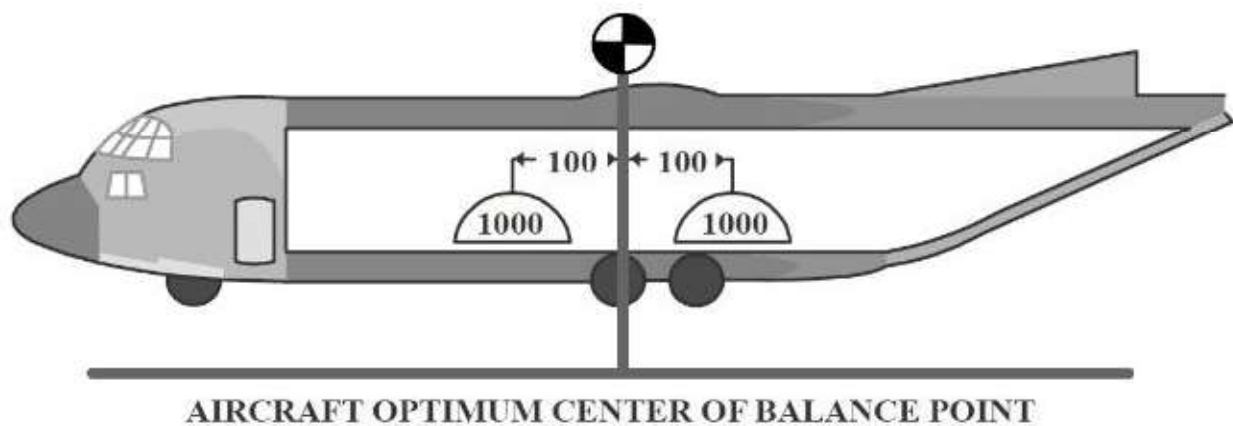


Figure 2-45 — 50-50 loading method.

1.10.5 Determining Weight and Balance of an Aircraft

The same process used for computing the CB for wheel items of cargo is used to compute aircraft weight and balance; however, when computing aircraft weight and balance, simplify or reduce load-item moments by dividing the applicable factor shown below into your whole moment and then use normal rounding rules (0.5 or more rounds to the next whole number, less than 0.5 rounds down).

C-130	divide by	1,000 (move 3 places left)
C-17	divide by	10,000 (move 4 places left)
C-5	divide by	100,000 (move 5 places left)

Example: A C-130 moment of 7,305,560 would be simplified to 7,306.

Figure 2-46 shows the formula for determining weight and balance of a C-17.

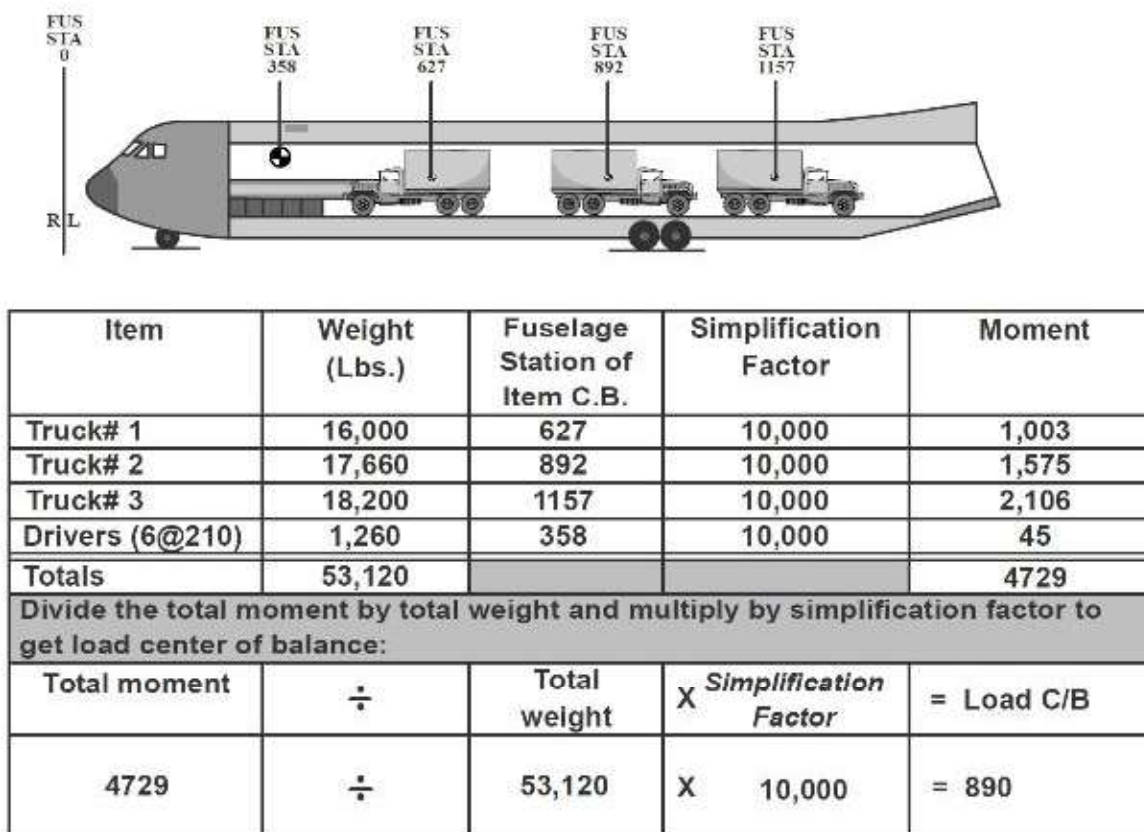


Figure 2-46 — Determining weight and balance of a C-17.

Test your Knowledge (Select the Correct Response)

14. (True or False) Aircraft flight performance depends on the proper location of CB.
- A. True
 - B. False
15. Where on the aircraft are fuselage stations identified?
- A. Wall
 - B. Cargo ramp
 - C. Aisleways
 - D. Runway

1.11.0 Load Planning

After identifying the cargo and personnel to be airlifted and establishing movement priorities, complete load planning forms such as Load Plans, Passenger Manifest, and Cargo Manifest. *AMC Affiliation Workbook 36-0101 Volume 2 Airlift Planner Course* provides instructions for completing these forms.

1.11.1 Load Plans, DD Form 2130 Series

Load Plans, DD Form 2130 Series for C-130, C-141, and C-5 aircrafts are similar. *Figure 2-47* shows a C-130 Load Plan, DD Form 2130-2.

1. UNIT BEING AIRLIFTED (Name or Number)		2. UNIT IDENTIFICATION CODE		3. TYPE MOVEMENT PLAN		4. MOVEMENT DATE		5. UNIT AIRCRAFT LOAD NO.		PAGE OF PAGES				
6. MISSION NUMBER		7. AIRCRAFT SERIAL NUMBER		8. CONFIGURATION		9. DEPARTURE AIRFIELD		10. DESTINATION AIRFIELD						
11. ACTUAL LOADOUT														
<div>SCALE: 1/4 INCH = 3 FEET</div> <div><div>C-130 A/E/H</div><div><div>247</div><div>1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16</div><div>332</div><div>422</div><div>512</div><div>602</div><div>692</div><div>803</div></div><div>C.B. CARGO PALLET POSITIONS</div><div><div>5000 LB TIEDOWN</div><div>10,000 LB TIEDOWN</div><div>25,000 LB TIEDOWN</div><div>SEAT STANCHION</div><div>VENT</div><div>SINGLE / DOUBLE SEATS</div><div>NO FLOOR LOADED CARGO</div><div>TROOP DOOR</div><div>VEHICLE TREADWAY</div></div><div><div>245</div><div>277</div><div>317</div><div>357</div><div>377</div><div>417</div><div>457</div><div>497</div><div>537</div><div>577</div><div>617</div><div>657</div><div>697</div><div>737</div><div>777</div><div>817</div><div>857</div><div>897</div></div></div>														
a. LOAD SEQUENCE	b. ITEM MODEL AND NOMENCLATURE/DESCRIPTION	c. TRANSPORTATION CONTROL NO. VEHICLE PACKAGE SERIAL NO. INCREMENT NO.	d. REMARKS	REMARKS CODE (From col. h.)	e. DIMENSIONAL DATA			f. PLANNED LOAD DATA			g. ACTUAL LOAD DATA			h. REMARKS CODES (For use in col. d.)
					OTHER REMARKS	TOTAL (in inches)	LENGTH	WIDTH	HEIGHT	GROSS WEIGHT (Total Pounds)	FUSELAGE STATION	MOMENT (11,000)	GROSS WEIGHT (Total Pounds)	
13. TOTAL WEIGHT/MOMENT FROM BACK														
14. TOTALS														
12. PASSENGER SEATS PLANNING DATA														
NUMBER SEATS	AVG. WEIGHT (Pounds Each)	TOTAL PLANNED WT.												
15a. LOAD PLANNER		DATE CERTIFIED	TYPED/PRINTED NAME, GRADE, ORGANIZATION OF LOADPLANNER											
15b. ACTUAL LOAD PLAN VALIDATOR		DATE CERTIFIED	TYPED/PRINTED NAME, GRADE, ORGANIZATION OF LOADPLAN VALIDATOR											
DD FORM 2130-2, SEP 1998			PREVIOUS EDITION IS OBSOLETE.											
NAVEDTRA 14080A			Designed using Perform Pro. WHS DIOR											

NOTE

Do not make photocopies of blank DD Form 2130 series Load Plans. This may cause the form to lose scale and change the dimensional quality of the aircraft schematic.

1.11.2 Passenger Manifest, DD Form 2131

The Passenger Manifest, DD Form 2131 (*Figure 2-48*), is used to list the names of the deploying personnel. Seven copies are distributed for CONUS movement. They are distributed to the following groups and personnel:

- Departure airfield TALCE
- Departure DACG Transportation Control Unit (TCU)
- Loading team chief
- Aircraft loadmaster or boom operator
- Arrival airfield TALCE
- Aircraft cargo courier or troop commander
- Arrival airfield Control Group(AACG)

[illegible]

Figure 2-48 — Passenger manifest, DD form 2131.

1.11.3 Cargo Manifest, DD Form 1385

The Cargo Manifest, DD Form 1385 (*Figure 2-49*), is an inventory of the cargo aboard an aircraft. For CONUS movement, the same seven groups and personnel listed above receive a copy of the DD Form 1385. For outside CONUS, eight additional copies are prepared for customs and foreign clearance.

CARGO MANIFEST																											
AIRCRAFT DATA				DEST CODE		REF		DESTINATION		MISSION DATA				ALIN WT		ALIN CG		MANIFEST ID				PAGE NO.					
AIR	CARRIER	AC NO.	AC MODEL							NO.	BU	DATE					STA	PR	TY	NO.							
SURFACE		POB	DATE SAILED	VOYAGE DOCUMENT NO.		POB	REF	VESSEL NAME		STATUS	SUST	TRUCK NO.	REMARKS									PAGE NO.					
DOC ID	VEHICLE TRAILER OR CONTAINER NUMBER	YR	MAKE	CHTRM NUMBER	COM CODE	CAR-DO ENG	VOYAGE DOC NO.	PORT OF DISCH	TYPE PACK	TRANSPORTATION CONTROL NUMBER	CONSIGNEE	NAME	AMMO LOT NO/MOMEN	DIMENSIONS	IDENTIFICATION NO. OR REMARKS	PIECES	WEIGHT	CUBE									
																			ACTIVITY ADDRESS	REG	PROJ	STOW LOC	TRANS ACCT				
SAMPLE																											
ITEMS HAVE BEEN LOADED:										ITEMS HAVE BEEN RECEIVED EXCEPT AS CIRCLED NOTED ON REVERSE SIDE										TOTALS		0		0.00		0.00	
DATE		SIGNATURE OF LOADING AGENT				DATE		SIGNATURE OF UNLOADING AGENT				DATE		SIGNATURE OF RECEIVING AGENT													

DD FORM 1385, NOV 78

REPLACES EDITION OF 1 APR 66 WHICH MAY BE USED

Figure 2-49 — Cargo manifest, DD form 1385.

Test your Knowledge (Select the Correct Response)

16. What form is used to list the names of the deploying personnel?
- A. DD Form 2131
 - B. DD Form 2130
 - C. DD Form 1385
 - D. DD Form 213

1.12.0 Safety

Safety is a very important consideration in any airlift movement. Injury to personnel or damage to equipment or aircraft will impact the overall mission's effectiveness. The aircraft flightline is a potentially dangerous area of operations. Listed below are a few of the rules and hazards to be aware of on all flightlines.

- Right-of-way. Aircraft have the right-of-way over motor vehicles; always yield or move out of the way.
- Smoking is not permitted on the flightline
- Doors and Ramps. Aircraft pallet doors/pressure doors can cause personal injury or equipment damage. Beware of aircraft ramps during opening to prevent injury or damage to equipment.
- Noise Hazard. Always wear ear protection. Aircraft engines and power units may ruin hearing.
- Exhaust Hazard. Engines and power units create a tremendous amount of heat in the normal course of their operation. Be extremely careful when around them.
- Propeller and Engine Ingestion Hazards. Propellers pose an obvious hazard. Jet aircraft engines create a vacuum near the intake and can pick up and ingest nearby objects. Restrict activities near the front of an operating engine.

NOTE

Aircraft, aircraft parking ramps, taxiways, hangars, and runways are controlled area with restricted access. Unless possessing a valid flightline driving certificate from the installation airfield manager, do not operate motorized vehicles in these areas unless under escort from the TALCE, A/DACG, or Embark personnel.

1.12.1 Circle of Safety

Vehicles are not allowed within the circle of safety, shown in *Figure 2-50*, unless they are to be loaded aboard or used to service the aircraft. All vehicles must approach the aircraft so the driver's side is toward the aircraft. Never drive a vehicle under any part of the aircraft or between the wing tips of parked aircraft.

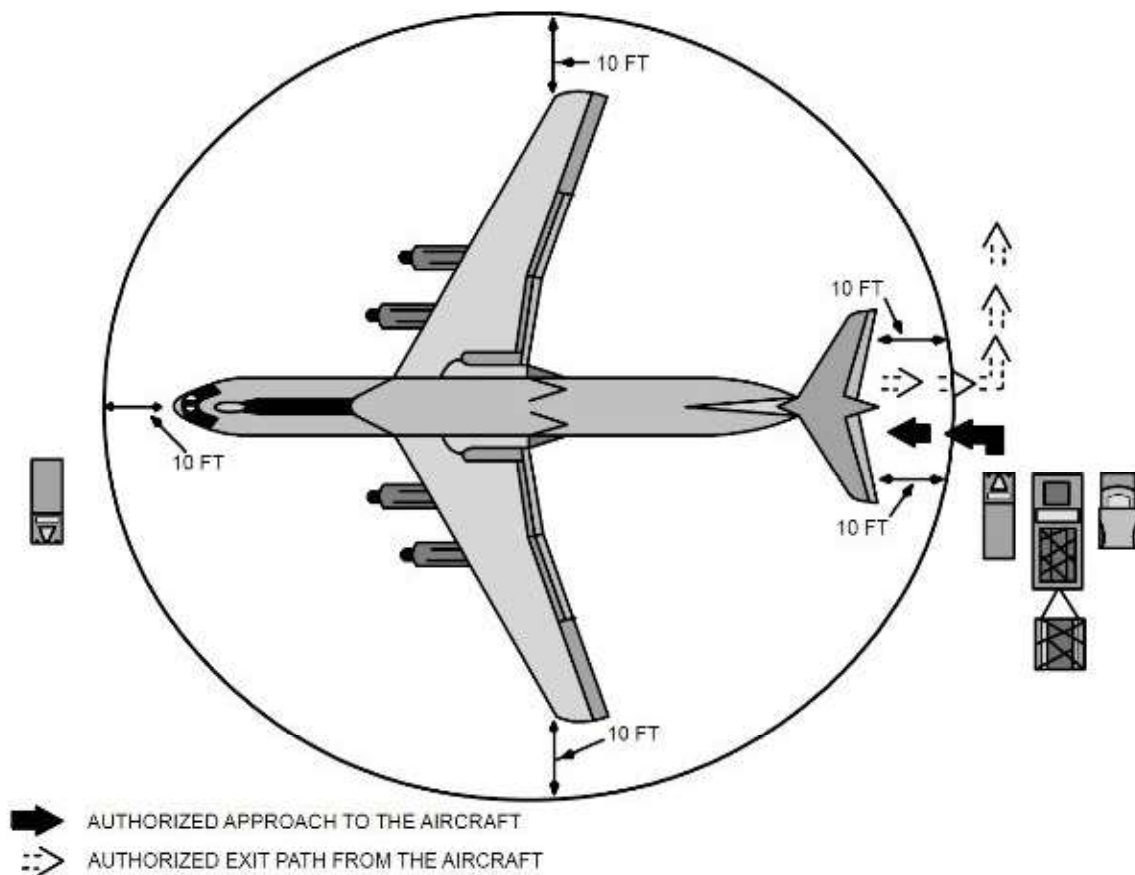


Figure 2-50 — Circle of safety.

1.12.2 Vehicle Parking Rules

The following are rules when parking a vehicle on the parking ramp:

- Park perpendicular to the fuselage outside the circle of safety.
- If the vehicle is left unattended:
 - Turn off the ignition and leave the key in the ignition.
 - Put the vehicle in the lowest gear (standard shift, gasoline-powered), neutral (diesel-powered vehicles), or “park” (automatic transmission).
 - Set the emergency (parking) brake.
- Use parking lights or emergency flashers during the hours of darkness or during inclement weather.

1.12.3 Loading Safety

Special hazards are present when loading or offloading an aircraft. Listed below are some rules that apply to loading operations.

- Vehicle drivers will NOT back a vehicle toward or into an aircraft until spotters are in place and directed by a guide. A wheel chock will be pre-positioned on the tarmac to prevent the vehicle from striking the aircraft.

- Do NOT stand or walk in front of or behind vehicles that are being loaded or offloaded.
- Only one person will provide directions to the vehicle operator while the vehicle is onloaded or offloaded from the aircraft.
- All safety chains, pintle hook pins, electric cables, and brake lines will be installed before towing trailers. Secure the trailer third wheel before onloading or offloading.
- Do NOT leave vehicles on the cargo floor unattended until a minimum of one forward and one aft restraint device is installed. Only then may the brakes be released or the winch cable removed.
- Load team members should NOT wear rings or other jewelry that could create a safety hazard.
- Load team members should wear gloves.
- No equipment (such as tie-down chains, chocks) will be thrown about the aircraft.
- Only minimum essential personnel will be in the cargo compartment during winching operations.
- Do NOT step on winch cables.
- Do NOT walk across winch cables while winching.

1.12.4 Offload Safety

The following special rules apply to offload operations.

- If cargo permits, passengers should exit the aircraft before any main floor loaded vehicle are offloaded.
- Do NOT remove restraints devices or start any vehicle until told to do so by a loadmaster.
- Engine Running Onload/Offload (ERO). Safety Considerations:
 - During adverse weather, the vision of all participants may be obscured by the elements. Additional safety measures may be required.
 - Self-propelled vehicles may require winching assistance if positive traction of vehicle wheels cannot be maintained throughout the onload or offload operation. Non-skid (Arctic) shoring may be used in lieu of winching.
 - On other hard surfaces, safety goggles are required. Safety goggles are highly recommended for all ERO operations.
 - All personnel must wear hearing protection, gloves, reflective gear for nighttime operations, and appropriate boots.
- During EROs, the following distance must be adhered to for safety considerations:
 - C-130. Vehicles and all personnel will proceed directly aft of the aircraft at least 50 feet before turning and/or 300 feet before stopping.
 - C-5. Vehicles and all personnel exiting via the forward or aft ramp will proceed on a direct line with the fuselage at least 150 feet before turning and at least 300 feet before stopping.

- C-17. Vehicles and all personnel exiting via the ramp will proceed directly aft of the aircraft at least 25 feet before turning and at least 200 feet before stopping.

Test your Knowledge (Select the Correct Response)

17. **(True or False)** It is a safety practice to restrict activities near the front of an operating engine.
- A. True
 - B. False
18. **(True or False)** Vehicles are not allowed within the circle of safety unless they are to be loaded aboard or used to service the aircraft.
- A. True
 - B. False

1.13.0 Site Arrival

When the Air Det embarks by airlift, all members of the Air Det are listed on the manifest and are scheduled to fly by chalk numbers. The number of passengers (PAXs) allotted on an aircraft depends on the weight of the cargo or CESE loaded on the aircraft. The Equipment Operators (EOs) assigned to a specific CESE accompany that CESE aboard the aircraft.

Normally, EOs are assigned, with support from other ratings, the duties of the Arrival Airlift Control Group (AACG). The AACG group is usually scheduled to fly out on the first chalk, and at the mission site supports the Air Force with the unloading and staging of cargo and CESE from the aircraft. The AACG group normally remains at the air base until all the scheduled chawks arrive at the mission site.

The horizontal construction platoon transports cargo, baggage, CESE, and personnel from the air field to the deployment site. This movement may require a tactical convoy or a non-tactical convoy procedure. Convoy procedures are outlined in the *Naval Construction Force Embarkation Manual*, COMSECOND/COMTHIRDNCBINST 3120.1 series and *Equipment Management*, COMSECOND/COMTHIRDNCBINST 11200.1 series.

During the first few days of an Air Det mission, before the supplies and CESE arrive and the camp is completed, the troops endure abnormal living conditions which can be detrimental to their morale. Once the supplies start to arrive, the setup of priority areas should immediately begin. These areas are the shower tent for hot showers, the galley tent for hot meals, and the berthing tents to store gear and to sleep in. When provided properly, these facilities will make a profound difference in the morale and welfare of the troops.

The support platoon has the key responsibility for the camp setup. Some of the platoon's responsibilities are camp electrical distribution, camp tent layout, galley facilities, shower facilities, laundry facilities (depending on the duration of the mission), medical facility, communications gear setup, latrines, and so forth. The construction of an Air Det camp is an "all hands" effort.

Delays can hamper plans for personnel, supplies, CESE, and construction operations and force the Air Det to have to regroup and manage with the resources on hand. Therefore, every operation the Air Det is involved in must be prioritized.

1.13.1 Site Selection

The Air Det Equipment Supervisor works closely with the Air Det staff when considering an area to set up the horizontal construction platoon operations. The selection of the site depends upon the mission, the terrain, and climatic conditions. When possible, locate the horizontal construction platoon operations close to the center of activity to allow the equipment to be used economically and efficiently.

Drainage must not be overlooked. In some areas the Equipment Supervisor may already have natural drainage, while other areas may require construction of extensive drainage systems. The Equipment Supervisor must remember that large-scale grubbing operations often produce damaging environmental effects. Save as much vegetation as possible to prevent soil erosion.

Allow adequate space to turn around tractor trailers, to build an equipment loading ramp, to build an equipment parking area, and to provide an area for equipment maintenance operations. Consider areas to disperse the equipment in a tactical environment to lessen possible damage from rocket or mortar attacks. Equipment parked in a neat, close file or in rows present large targets. Additionally, make sure entrances and exits are laid out to allow for a smooth flow of traffic and are wide enough to accommodate the largest piece of construction equipment.

Other areas to consider are as follows: locations for collateral equipment and attachments, dispatch and maintenance tents, POL storage, storage for vehicle shoring, storage for the 463L pallets, and the vehicle wash area.

1.13.2 Horizontal Construction Platoon Operations

The horizontal construction platoon's primary responsibility is to support the requirements of the support platoon; however, it also has its own areas of responsibility. One area of responsibility is the control and accountability of CESE. When control and accountability of CESE are delayed and are not implemented at the start of the mission, problems are sure to develop. Some problems that the Equipment Supervisor can expect are unexplainable damages to CESE, lost keys, neglected operator maintenance, loss of collateral equipment, and even theft.

Dispatch operations must start at the very beginning of the mission. All operators who are assigned to fly with a piece of CESE must report to the Dispatcher when the CESE arrives at the mission site. The Dispatcher should have an equipment status board that denotes the status of all CESE and an area to secure equipment keys. Dispatch operations may have to be performed out of a box before the dispatch tent is erected. The Dispatcher must plan for these situations. The best method for control and accountability is to Class "C" assign all CESE.

The Air Det has to account for all hours and mileage put on CESE during a mission. The Equipment Supervisor is responsible for reviewing Trip Tickets, Hard Cards and Dispatcher's Log as outlined in COMFIRSTNCDINST 11200.2, for an Alfa Company Operations Supervisor.

The Equipment Supervisor must stay on top of all equipment-related operations of the Air Det. During the first few days of a mission, the forklift is one of the most important pieces of CESE. The forklift is required to reassemble CESE, break down pallets, move tent boxes, unload tractor-trailers, and so forth; therefore, to ensure the optimum use of the forklift, these tasks must be prioritized.

The Equipment Supervisor must remember that safety is paramount and CESE must be reassembled before use. Reassembling CESE is a time-consuming forklift operation

that delays individual priorities of other members of the Air Det. Therefore, it must be understood and enforced that tasks do not always have to be accomplished with the support of equipment and that waiting for the availability of the equipment is not worth the time wasted. Use troops to accomplish tasks that can be done manually (manual labor), such as breaking down pallets, digging latrines, moving tent boxes, unloading trucks, and so forth. These tasks must be accomplished with or without the support of equipment.

The horizontal construction platoon also has the responsibility to check and fill the water buffalos with potable water, maintain the water in the shower water bladders, and make daily garbage runs. These areas must not be overlooked during the planning phase. A piece of CESE (water truck, dump truck) will have to be dedicated to support this task. Water buffalos normally embark empty unless it is determined that potable water is not immediately available.

Equipment repair operations and the use of POL products and 55-gallon fuel drums must be closely monitored to avoid any contaminating spills. Lubricating oil, fuel, hydraulic fluids, transmission fluids, and antifreeze contain hazardous chemical properties. When these items are mishandled and spilled, they can leak into the groundwater system or into the human food chain. Mishandling the “hurdy-gurdy” while dispensing fuel in vehicles or in fuel cans can cause excessive fuel spills that can be disastrous to the environment. Fifty-five-gallon fuel drums and POL products should be stored at least 50 feet away from any structure and located so vehicles and equipment can be easily topped off at the end of each day. Depending on the mission, the POL products and 55-gallon drums should be in a protected position (away from likely avenues of attack) that provides protection to the fuel storage area as well as to adjacent facilities. Fire extinguishers must be placed for easy accessibility and “No Smoking” signs must be posted in the POL products and fuel storage area.

Embarked with limited resources, the maintenance field crew and field crew truck play a major role throughout the Air Det mission. The field crew truck is loaded with the necessary tools and consumable supplies that support the reassembling of CESE, setting up of light plants, setting up of camp electrical supply (generators), repairing of hand tools, and so forth. Additionally, the maintenance field crew is required at the airfield during aircraft flight unloading operations in case a piece of CESE cannot start or breaks down while on board the aircraft. Depending on the mission, the maintenance field crew truck can be used for delivering fuel by loading and securing a 55-gallon drum of fuel in the back of the truck. This expedites fuel runs for equipment on construction projects or for the camp generators. The requirements for maintenance field crew support include a radio for communications with the maintenance field crew and the Air Det camp. A field crew must be equipped with the proper communication capability to respond to mission requirements expeditiously.

The Air Det maintenance supervisor should direct the operations of the maintenance field crew and also know the status of all CESE assigned to the Air Det. The maintenance supervisor has the responsibility to set up the maintenance shop and set up a preventive maintenance schedule for CESE assigned. All maintenance performed that requires repair parts or lube oils, or exceeds one man-hour must be documented.

Depending on the duration of the mission, the Air Det normally schedules means for logistic support and communications with the main body. Equipment repair parts not covered in the mod 96 or mod 98 normally can be acquired through this logistic support. The Air Det maintenance and equipment management program should mirror that of the main body. The management guidelines are provided in COMFIRSTNCDINST 11200.2.

The success of the Air Det mission is primary, but should not be attained at the cost of destroyed CESE. Maintenance is mandatory and must be strongly enforced by the entire Air Det chain of command. CESE damaged by operator negligence or lack of operator maintenance is unacceptable. Equipment failure can seriously jeopardize mission success.

1.13.3 Projects

The primary purpose of the vertical construction platoon is to perform construction operations for the Air Det with the support of the horizontal construction and support platoons. Construction tasking covers a large range of tasks that include disaster recovery operations, war damage repairs, rapid runway repairs, humanitarian relief, and construction of ABFC. The tailoring of ratings assigned to the Air Det is dependent upon the extent and variety of the assigned tasking.

The amount of time allotted to plan construction projects depends on the urgency of the Air Det to embark to the mission site. Urgent situations can cause the Air Det to embark and manage construction projects with just the basic TOA items. The Equipment Supervisor has to plan CESE support for the construction projects, and priorities should be set up as soon as possible due to the limited amount of CESE embarked with the Air Det. Remember, priorities are subject to change, depending on operational conditions.

1.13.4 Air Det Mount-Out/Retrograde

At the completion of the mission, the Air Det receives orders from higher command to prepare to mount out to relocate or to return to the main body site. The Air Det will have to mount out itself to include the weighing and balancing of CESE, building pallets, developing load plans, and developing convoy procedures, if required. The Air Det should divide into two shifts, as shown in *Figure 2-51*, to achieve maximum production and to avoid overworking the troops.

EMBARK OFFICER - _____

LOAD PLANNER - _____, _____, _____

DASH TWO CERTIFICATION - _____, _____

STAGING AND CESE PREPARATION

PALLET BUILDING

DAY

NIGHT

CREW LEADER

FORKLIFT OPERATOR

CREW ONE

CREW TWO

WEIGHING AND MARKING

CREW LEADER

CESE PREPARATION

CREW LEADER

MECHANICS

ARRIVAL/DEPARTURE AIRLIFT CONTROL GROUP (AACG/DACG)

AACG

DACG

LPO

FORKLIFT OPERATOR

CREW

ALTERNATES

Figure 2-51 — Sample of the Air Det mount-out organization.

The Air Det Equipment Supervisor plays a key role, along with the Air Det staff, when prioritizing CESE and supplies to be mounted out. Certain CESE and supplies, such as tractor and trailers, forklifts, the maintenance field crew truck, light plants, and various tools, are required. These CESE and supplies are used to support the building of pallets, disassembling of CESE, breaking down of the camp, making garbage runs, hauling of CESE, and transporting of supplies and personnel to the staging area. This movement from the campsite to the airfield may require a tactical or non-tactical convoy procedure.

Another area the Equipment Supervisor must consider is a productive method for washing and preparing CESE for the mount-out. The task of cleaning CESE is one that must not be overlooked and should be addressed before deploying to the mission site. The prepping of CESE in the field can be a time-consuming task and, if not properly planned, could result in failure to meet the deadline for the joint inspection.

An efficient means for washing CESE is to locate a wash rack or to build one. Some considerations in selecting the location of the wash rack are as follows: the distance the CESE must be driven once it has been washed, the amount of water required to wash each piece of CESE (if using the water truck), and the distance the water truck must travel to obtain water.

A pressure washer located at the wash rack is desirable and should be augmented to the Air Det; however, they are sometimes hard to obtain. Some pressure washers require small quantities of water and can be connected to a water buffalo with a garden hose to provide a very efficient tool for washing CESE.

A de-bugging steam wash may be required on all CESE that is to be returned to the host country. Normally, this is a rule directed by the Department of Agriculture of the host nation. After all the pallets are built and the CESE is prepared, the Air Det has the responsibility to develop its own load plans and to set up the marshaling area by chalks. A pre-JI inspection is normally held that allows the Air Det time to correct any discrepancy. Again, operators must stand by their CESE during the inspection.

The “fly away” can take several days; therefore, arrangements should be made for rations and berthing for those personnel who are scheduled on the last chalks. The maintenance field crew is normally among those personnel. The field crew is required to stand by to repair any unplanned breakdowns of CESE that are to be loaded on the aircraft. Another group of personnel that remains at the airfield is the Departure Airlift Control Group (DACG). The DACG supports the Air Force with the loading and securing of CESE and 463L pallets onto the aircraft.

Normally, the majority of Air Det personnel are manifested to be on the first group of chalks to fly out. These members will have the responsibility to perform the Air Det retrograde. The retrograde is the period of time used to inventory, reorder, clean, and turn in all the supplies and gear embarked with the Air Det.

Normally, CESE returning from the Air Det operation is directed through the maintenance shop. This allows CESE to receive an acceptance check before being returned to the field. The Air Det maintenance supervisor turns in all the OPNAV Forms 4790/2K and 4790/2L, 1250s, and vehicle history jackets (if deployed more than 30 days) used during the mission. The License Examiner turns in all license-related items and any accident reports to the battalion License Examiner, and the Air Det Dispatcher turns in the closed-out Dispatcher’ Logs, Hard Cards, and mileage reports to the battalion Dispatcher. All collateral equipment is inventoried and turned over to the battalion collateral equipment custodian.

After the completion of the retrograde, the Air Det chain of command will forward an after action report to the battalion chain of command. This report contains a daily diary of events, the personnel embarked, CESE and supplies embarked, tasks assigned and completed, man-days expended, lessons learned, and so forth. Therefore, remember to keep records of lessons learned throughout the mission. This will support the after action report, plus help plan future missions.

Remember, the final condition of CESE and the positive accountability of collateral equipment and tool kits are the Equipment Supervisor's final grade on how well the equipment management program was conducted during the Air Det mission.

Test your Knowledge (Select the Correct Response)

19. What environmental factor must not be overlooked when considering a site for the equipment pool?
 - A. Drainage
 - B. Type of soil
 - C. Amount of vegetation
 - D. Amount of trees

20. For control and accountability, what is the best dispatch assignment for Air Det assigned CESE?
 - A. Class A
 - B. Class B
 - C. Class C
 - D. Class D

Summary

This chapter introduced you to the responsibilities of an Air Det Equipment Supervisor as well as to Air Det operations. This chapter described the military aircrafts commonly used by the NCF for tactical and strategic airlifts. Additionally, this chapter covered cargo palletization and tie-down, procedures of weighing and marking the center of balance of vehicles and married pallets, and described the categories of shoring used for protecting the aircraft cargo floor and parking ramps, and the surfaces of 463L pallets. This chapter also identified the forms used during joint inspections as well as load planning. Because safety is of high importance when loading and offloading an aircraft, this chapter also listed safety practices to adhere to when operating near aircrafts.

Review Questions (Select the Correct Response)

1. After notification, the Air Det should be capable of deploying within a maximum of how many hours?
 - A. 72
 - B. 48
 - C. 24
 - D. 12
2. What person serves as the equipment officer for CESE assigned to the Air Det?
 - A. OIC
 - B. AOIC
 - C. Air Chief
 - D. Ops Chief
3. What person is responsible for the daily management of assigned CESE to the Air Det?
 - A. Officer in charge (OIC)
 - B. Assistant officer in charge (AOIC)
 - C. Senior Alfa Company rating
 - D. Air Det operations chief
4. Which form is NOT required to be stored for support of equipment platoon readiness?
 - A. NAVFAC 9-11260/4
 - B. NAVFAC 9-11240/13
 - C. NAVFAC 9-11200/45
 - D. NAVFAC 9-11240/2
5. **(True or False)** An NMCB TOA is echeloned into an Air Detachment, Air Echelon, and Sea Echelon.
 - A. True
 - B. False
6. What command is responsible for maintaining the NFC TOA?
 - A. NFEC
 - B. NFELC
 - C. NICP
 - D. NSSC

7. What is the kit number designator for lubrication equipment and accessories?
- A. 80013
 - B. 80031
 - C. 80057
 - D. 80107
8. When requesting repair parts and POL products, the lead mechanic coordinates the request with what person?
- A. Heavy Shop Supervisor
 - B. Light Shop Supervisor
 - C. Maintenance Supervisor
 - D. 5000 Shop Supervisor
9. During the 48 hour mount-out the requested kits and supplies are staged at what location?
- A. Alfa Company yard
 - B. Battalion grinder
 - C. Battalion spaces
 - D. Marshaling area
10. When the Equipment Supervisor modifies the equipment allowance, which information is NOT a consideration?
- A. Convoy capabilities
 - B. Equipment specification
 - C. Aircraft certification and certificability
 - D. Number of licensed operators for specific equipment
11. **(True or False)** Proper management of the Air Det collateral equipment program enhances the equipment management program for the Air Det.
- A. True
 - B. False
12. Who directs the operations of the MOCC?
- A. Equipment officer
 - B. Supply officer
 - C. Executive officer
 - D. Embarkation officer
13. Which factor does NOT limit an Aircraft's ACL?
- A. Distance
 - B. Specific type of mission
 - C. Route to be flown
 - D. Weather

14. The C-130 is also referred to as the _____.
- A. Galaxy
 - B. Hercules
 - C. Globemaster III
 - D. Starlifter
15. On the C-130, the cargo ramp is _____ inches long and _____ inches wide.
- A. 172/151
 - B. 127/115
 - C. 123/115
 - D. 102/114
16. The planning ACL for the C-130 is _____ pounds.
- A. 30,000
 - B. 25,000
 - C. 20,000
 - D. 15,000
17. What Aircraft is used for inter-theater (strategic) Airlifts of outsized cargo?
- A. C-130
 - B. C-17
 - C. C-5
 - D. KC-10
18. **(True or False)** The C-5 employs the use of four cargo-loading ramps.
- A. True
 - B. False
19. The normal ACL for the C-5 is _____ pounds.
- A. 250,000
 - B. 200,000
 - C. 150,000
 - D. 100,000
20. Which Aircraft is used for the intra-theater Airlift of large, outsized items of cargo to small austere Airfields at or near the battle area?
- A. C-130
 - B. C-17
 - C. C-5
 - D. KC-10

21. For most operations, the ACL for the C-17 is up to _____ pounds.
- A. 100,000
 - B. 90,000
 - C. 80,000
 - D. 70,000
22. The surface structure of the 463L pallet is made of corrosion-resistant aluminum. The core is made of what material?
- A. Plywood
 - B. Hardwood
 - C. Dogwood
 - D. Softwood
23. The usable dimensions of the upper surface of the 463L pallet are _____ inches by _____ inches.
- A. 88/108
 - B. 86/106
 - C. 84/104
 - D. 82/102
24. The top net of the pallet nets is identified by what color?
- A. Blue
 - B. Green
 - C. Yellow
 - D. Brown
25. A complete set of 463L nets will provide adequate restraint for _____ pounds of cargo when properly attached to a 463L pallet, with height not exceeding _____ inches above the surface of the pallet.
- A. 10,000/100
 - B. 10,000/96
 - C. 9,000/100
 - D. 9,000/96
26. **(True or False)** To protect the lower surface from damage, two pieces of dunnage are used to support each 463L pallet while on the ground.
- A. True
 - B. False
27. Hazard materials are palletized and handled in accordance with what publication?
- A. NAVFAC P-505
 - B. NAVSUP P-505
 - C. NAVAIR P-505
 - D. COMFIRSTNCDINST 505

28. Do NOT attach more than _____ of the required restraint in a given direction to the axles of wheeled equipment.
- A. 1/2
 - B. 1/3
 - C. 1/4
 - D. 1/5
29. **(True or False)** When a loaded pallet is weighed, pieces of dunnage are not included in the total weight.
- A. True
 - B. False
30. What form annotates the required information for cargo documentation and identifies all completed 462L pallets/trains loaded with cargo?
- A. DD Form 2275
 - B. DD Form 2133
 - C. DD Form 2131
 - D. DD Form 1387-2
31. **(True or False)** After a pallet is weighed, two copies of DD Forms 2775 are attached to the upper left-hand corner of both 88-inch sides.
- A. True
 - B. False
32. Technical publications require forklifts tines be what minimum length, in inches?
- A. 82
 - B. 72
 - C. 60
 - D. 48
33. What forklift in the NCF TOA has a set of roller tine fork extensions assigned as an attachment?
- A. RT
 - B. 4K
 - C. 6K
 - D. 12 Lift King
34. Moment is the product obtained by what method?
- A. Dividing weight in pounds by distance in inches from the RL
 - B. Multiplying weight in pounds by distance in inches from the RL
 - C. Adding weight in pounds and distance in inches from RL
 - D. Subtracting weight in pounds and distance in inches from RL

35. **(True or False)** Marking the CB on married pallets is not necessary.
- A. True
 - B. False
36. When a vehicle is marked, the horizontal portion of the "T" will contain what information?
- A. CB
 - B. GW
 - C. FAW
 - D. MAW
37. What category of shoring protects Airport parking ramps and the cargo floor or loading ramps of cargo Aircraft?
- A. Rolling
 - B. Parking
 - C. Sleeping
 - D. Approach
38. Any equipment or vehicle requiring rolling shoring also requires _____ shoring.
- A. parking
 - B. sleeping
 - C. spreading
 - D. approach
39. What is the minimum thickness of parking shoring, in inches?
- A. 1
 - B. $\frac{1}{2}$
 - C. $\frac{3}{4}$
 - D. $\frac{1}{4}$
40. What shoring should you use to protect the Aircraft floor or ramps from contact from blades, buckets, forklift tines, steel wheels, or trailer tongue supports?
- A. Rolling
 - B. Parking
 - C. Sleeping
 - D. Approach
41. Sleeping shoring is used under the frame or axles of vehicles that weigh over _____ pounds.
- A. 35,000
 - B. 30,000
 - C. 25,000
 - D. 20,000

42. What shoring is used to prevent vehicles with soft tires from bouncing inside the Aircraft?
- A. Parking
 - B. Sleeping
 - C. Spreading
 - D. Approach
43. What shoring is required for long vehicles with limited ground clearance?
- A. Parking
 - B. Sleeping
 - C. Spreading
 - D. Approach
44. In what area are equipment and materials received?
- A. Marshaling and staging
 - B. Joint inspection
 - C. Onboard cargo
 - D. Approach
45. What publication provides instructions for completing the DD Form 2133?
- A. AMC Affiliation Workbook 36-101 Volume 1 Equipment Preparation Course
 - B. AMC Affiliation Workbook 36-101 Volume 2 Airlift Planner Course
 - C. COMFIRSTNCD 11200.2
 - D. NAVSUP P-505
46. **(True or False)** The 50-50 loading method places the heaviest cargo item over the optimum load center of balance.
- A. True
 - B. False
47. For CONUS movement, how many copies of DD Form 2131 are distributed?
- A. 9
 - B. 8
 - C. 7
 - D. 6

48. For outside CONUS movement, how many additional copies of DD Form 1385 are prepared?
- A. 9
 - B. 8
 - C. 7
 - D. 6
49. **(True or False)** Aircraft, Aircraft parking ramps, taxiways, hangars, and runways are controlled area with restricted access.
- A. True
 - B. False
50. On a C-230 during EROs, vehicles and all personnel will proceed directly aft of the Aircraft at least _____ feet before turning and/or _____ feet before stopping.
- A. 150/200
 - B. 50/300
 - C. 50/200
 - D. 25/200
51. When parking a vehicle with an automatic transmission on the parking ramp, it is a safe practice to put the vehicle in _____.
- A. the lowest gear
 - B. the highest gear
 - C. neutral
 - D. park
52. **(True or False)** It is a safe loading practice NOT to leave vehicles on the cargo floor unattended until a minimum of one forward and one aft restraint device is installed.
- A. True
 - B. False
53. When the Air Det embarks by Airlift, what number designates how many members are scheduled to depart?
- A. Ticket number
 - B. Aircraft number
 - C. Chalk number
 - D. Seat number

54. What group normally remains at the Airfield until all scheduled chalks arrive at the mission site?
- A. Arrival Air Force Control Group
 - B. Airlift Arrival Control Group
 - C. Arrival Airlift Combat Group
 - D. Arrival Airlift Control Group
55. What platoon has the responsibility of transporting both cargo and personnel from the Airfield to the mission site?
- A. Horizontal construction
 - B. Support
 - C. Transport
 - D. Vertical construction
56. What platoon has the key responsibility for camp setup?
- A. Horizontal construction
 - B. Support
 - C. Transport
 - D. Vertical construction
57. What person is responsible for equipment-related operations of the Air Det?
- A. Support Supervisor
 - B. Vertical Construction Supervisor
 - C. Equipment Supervisor
 - D. Assistant Officer in Charge
58. During the first few days of Air Det operations, what is one of the most important pieces of CESE?
- A. Roller
 - B. Forklift
 - C. Grader
 - D. Generator
59. What platoon has the responsibility to check and fill water buffalos and make daily dump runs?
- A. Horizontal construction
 - B. Support
 - C. Transport
 - D. Vertical construction

60. Fuel drums and POL products must be stored what minimum number of feet away from any structure?
- A. 50
 - B. 45
 - C. 30
 - D. 25
61. What supervisor should direct the operations of the maintenance field crew?
- A. Support Platoon Supervisor
 - B. Air Det Maintenance Supervisor
 - C. Construction Platoon Supervisor
 - D. Air Det Engineer Supervisor
62. When performing maintenance on Air Det CESE, the Maintenance Supervisor is required to document which items?
- A. Repair parts used
 - B. Lube oils used
 - C. Man-hours expended
 - D. All of the above
63. **(True or False)** The success of the Air Det mission is primary and should always be attained even at the cost of destroying CESE.
- A. True
 - B. False
64. What is the primary function of the construction platoon?
- A. To perform equipment operations
 - B. To perform camp operations
 - C. To perform construction operations
 - D. To perform communication operations
65. **(True or False)** The tailoring of ratings assigned to the Air Det is dependent upon the extent and variety of tasking.
- A. True
 - B. False
66. What person is responsible for developing a productive method for washing CESE for the mount-out?
- A. Support Supervisor
 - B. Air Det Operations Chief
 - C. Equipment Supervisor
 - D. Air Det Embarkation Officer

67. **(True or False)** CESE preparation is a time-consuming event that must be properly planned in order to meet the deadline for the joint inspection.
- A. True
 - B. False
68. What government agency may require a de-bugging steam wash on all CESE?
- A. Department of Environmental Protection
 - B. Department of Motor Vehicles
 - C. Department of Health and Welfare
 - D. Department of Agricultural
69. What does the acronym DACG stand for?
- A. Department Airlift Crew Group
 - B. Deployment Airlift Construction Group
 - C. Departure Airlift Construction Group
 - D. Department Airlift Control Group
70. What term identifies the period of time in which items are inventoried, reordered, cleaned, and turned in?
- A. BEEP
 - B. Mount-out
 - C. Retrograde
 - D. Return grade
71. **(True or False)** The final condition of CESE and positive accountability of collateral equipment and tool kits Determine the Equipment Supervisor's final grade in the successful management of Air Det CESE.
- A. True
 - B. False

Terms Introduced in this Chapter

Inter-theater (strategic) Airlifts

The continuous or sustained movement of units, personnel, and material in support of all Department of Defense agencies between area commands, and between the continental United State (CONUS) and overseas within an area of command, when directed. Strategic Airlift resource possesses the capability to Airland or Airdrop troops, supplies, and equipment for augmentation of tactical forces when required.

Intra-theater (tactical) Airlifts

Airlifts which provide the immediate and responsive Air movement and delivery of combat troops and supplies directly into objective areas through Airland, extraction, Airdrop, and other Air delivery techniques; and the Air logistics support of all theater forces, including those engaged in combat operations, to meet specific theater objectives and requirements.

Additional Resources and References

This chapter is intended to present thorough resources for task training. The following reference works are suggested for further study. This is optional material for continued education rather than for task training.

Air Mobility Command (AMC) Affiliation Workbook 36-101 Volume 1 Equipment Preparation Course, Air Mobility Warfare Center, 2002.

Air Mobility Command (AMC) Affiliation Workbook 36-101 Volume 2 Airlift Planners Course, Air Mobility Warfare Center, 2002.

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Movement Control Center, COMFIRSTNCDINST 3100.1, Department of the Navy, Commander First Naval Construction Division, 2008.

Naval Civil Engineering Operations, Navy Warfare Publication (NWP) 4-04, Department of the Navy Office of the Chief of Naval Operations, 2007.

Naval Construction Force (NCF) Air Detachment (Air Det) OPLAN, COMCBPAC 3120, COMCBLANT 3120, Department of the Navy, Commander Naval Construction Battalions US Pacific Fleet and Commander Naval Construction Battalions US Atlantic Fleet, 1999.

Naval Construction Force (NCF) Equipment Management Instruction, COMFIRSTNCDINST 11200.2, Department of Navy, First Naval Construction Division, 2006.

Naval Construction Force Operations, Navy Tactics, Techniques and Procedures (NTTP) 4-04.2, Department of the Navy Office of the Chief of Naval Operations, 2009.

Naval Construction Force (NCF) Policy, OPNAVINST 5450.46K, Department of the Navy, Office of the Chief of Naval Operations, 1999.

NMCB Operations Officer Handbook, COMSECONDNCB/COMTHIRDNCBINST 52.00.2B, Department of the Navy, Commander Second Naval Construction Brigade and Commander Third Naval Construction Brigade, 1999.

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