

CDC 2T251

Air Transportation Journeyman

Volume 2. Air Freight



**Air Force Career Development Academy
The Air University
Air Education and Training Command**

**2T251 02 1611, Edit Code 04
AFSC 2T251**

Authors: TSgt William T. Hamilton and
MSgt Kevin L. Gibson
345th Training Squadron
Logistics Training Center (AETC)
345TRS/TRR
711 B Avenue
Fort Lee, Virginia, 23801-1789
DSN: 539-1767/1763
E-mail addresses: william.t.hamilton40.mil@mail.mil and
kevin.l.gibson1.mil@mail.mil

Instructional Systems

Specialist: Evangeline K. Walmsley

Editor: Carrie Rodgers

Air Force Career Development Academy (AFCDA)
The Air University (AETC)
Maxwell Air Force Base, Gunter Annex, Alabama 36114–3107

THIS SECOND VOLUME of CDC 2T251, *Air Transportation Journeyman*, covers the cargo processing portion of the specialty from beginning to end. Unit 1 covers receiving and processing cargo and mail, including originating, in-transit, landbridge, and terminating procedures, as well as the various Defense Transportation System (DTS) roles and responsibilities. Unit 1 also covers how to care for pallets, nets, and other tie-downs, and how to build single pallets and multipallet trains. Unit 2 discusses hazardous materials, explosives, and special cargo. Unit 3 covers flight-line safety and aircraft loading operations, including preload operations and cargo loading procedures.

A glossary of abbreviations and acronyms used in this course is included at the end of this volume.

Code numbers on figures are for preparing agency identification only.

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This volume is valued at 18 hours and 6 points.

NOTE:

In this volume, the subject matter is divided into self-contained units. A unit menu begins each unit, identifying the lesson headings and numbers. After reading the unit menu page and unit introduction, study the section, answer the self-test questions, and compare your answers with those given at the end of the unit. Then do the unit review exercises.

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Unit 1. Cargo Fundamentals

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THIS UNIT IS PREDICATED on the fact that you should be familiar with automated cargo processing procedures, which you learned in tech school. In this unit, we will focus primarily on manual cargo procedures to include processing originating, in-transit, and landbridge cargo and mail, and processing and releasing terminating cargo and mail. As part of this lesson and for review, we will begin with a look at roles and responsibilities of the Defense Transportation System (DTS).

1–1. Processing Cargo and Mail

Moving cargo through the DTS can be a complicated process involving many different agencies. Some of those agencies have more responsibility than other agencies; however, everyone involved can make shipping cargo smooth and efficient if they learn the process, know their responsibilities, know how their responsibilities affect the process, and perform their duties to the best of their abilities. If all involved do their part, the customer will receive the right cargo, intact and on time—and that is the ultimate goal.

201. Originating cargo roles and responsibilities

Three publications govern the procedures and responsibilities for shipping cargo. The first, Military Standard (MIL–STD)–129R, *Military Standard Marking for Shipment and Storage*, provides the minimum requirements for standardized military marking of cargo. This document, as well as other MIL–STDs, is located at the following website: <https://assist.dla.mil/online/start/>. You must obtain an account to log in and view the publications and changes. The second publication, Department of Defense (DOD) 4500.9–R, *Defense Transportation Regulation, Part II, Cargo Movement*, is your “go-to book” for all things related to cargo and outlines procedures and responsibilities for all modes of transportation. Finally, Air Mobility Command Instruction (AMCI) 24–101, Volume 11, *Cargo and Mail Policy*, contains procedures and guidance to control cargo and mail movement within the Air Mobility Command (AMC) airlift system.

Shipper

Shippers play a crucial role in moving cargo. How fast and efficiently cargo moves is directly dependent on how well the shipper prepares a shipment and arranges for its movement.

Roles

A shipper is an agency or vendor that originates shipments. An agency can include a government or military agency or a contracting office or purchasing office. The shipper, often called a consignor, is critical to fast and efficient cargo movement in the DTS and is responsible for planning, assembling, consolidating, and documenting a shipment and arranging for its movement.

A vendor is simply a seller or merchant. The government uses vendors and contractor merchants quite frequently to provide supplies and services to its various agencies. Many times, shipments originate directly from the vendor to save money. For example, let us say you live in Ohio and want to purchase a gift for your sister who lives in Washington. You order something online from her favorite store (vendor) in Washington and to save shipping costs and time, you decide to have the store send it directly to her instead of you. It does not make sense to have the store ship it all the way to Ohio so you can ship right back to Washington. This is similar to how the direct vendor delivery (DVD) program works. The DVD was originally designed to reduce the expense of and need to store large quantities of items in DOD warehouses and reduce shipping time and cost. Vendors and contractor merchants must meet the same requirements shippers have for shipping cargo.

Responsibilities

The shipper's *first* step and responsibility is to determine the information necessary to complete shipping documentation. The shippers do *not* often figure out this information on their own; they enlist the help of the airlift clearance authority (ACA), which helps them prepare and correct shipping documents.

QUESTIONS TO ASK	INFORMATION REQUIRED TO ANSWER QUESTIONS AND ENSURE SMOOTH AND EFFICIENT SHIPMENT
Where is the cargo going?	Consignee address and code.
How fast does the consignee need the shipment?	Required delivery date (RDD). Transportation priority (TP).
Does the shipment require any special recognition or fall under any special plan, program, or exercise?	Project code.
Can a shipment with more than one item be consolidated into one box or container?	Shipment unit.
How will the shipment be identified and tracked in the DTS?	Transportation control number (TCN).
How large or small is the shipment?	Number of pieces, weight, cube, and dimensions.
How will the shipment get to the consignee?	Mode (air or surface). Method (motor, rail, airfreight, parcel post, etc.).
Does the shipment have a national stock number (NSN)?	Provide the NSN if it has one.
What, exactly, is the shipment and does it require special handling?	Commodity and special handling code. Cargo description (customs requirement for international export shipments) or nomenclature.
Where are the transshipment locations for the shipment?	Consolidation and containerization point (CCP), if eligible, and ports of embarkation (POE) and debarkation (POD), surface or air.
How will the shipment be paid for?	Transportation account code (TAC).
Does the shipment require additional information or instructions in order to be shipped?	Include detailed hazardous materials (HAZMAT) or personal property data, model, or serial numbers, special equipment required to handle, secure or lift the shipment.

The shipper's *second* step is to use all of the information gathered to *prepare* the DD (Department of Defense) Form 1384, Transportation Control and Movement Document (TCMD), and offer the shipment to the appropriate ACA for clearance into the DTS. An Advanced Transportation Control and Movement Document (ATCMD) is a prepared TCMD submitted to an ACA. It serves three purposes:

1. It provides a way to process a shipment through the ACA.
2. It provides notification to the aerial port of embarkation (APOE) that a shipment is inbound and requires further transfer.
3. It allows APOEs to manifest the shipment easily and efficiently.

After obtaining clearance from the ACA, the shipper packs and prepares the shipment for movement applying any required markings, labels, or radio frequency identification (RFID) tags. The shipper also prepares any additional required documentation for shipment. This can include documents such as the DD Form 1387, Military Shipping Label; the DD Form 1387-2, Special Handling Data/Certification; the Shipper's Declaration for Dangerous Goods (SDDG); any required commercial or government bills of lading (GBL); cargo transfer forms; load lists; air cargo pallet headers, pallet placards, and/or other required documentation. The shipper then makes the necessary arrangements to deliver the shipment to the transshipment point. This is referred to in the defense transportation regulation (DTR) as "making the shipment."

Once the shipment is complete, if any discrepancies occur in any stage of the movement, the shipper receives a request in the form of a transportation discrepancy report (TDR). The shipper is responsible for answering the TDR to provide the requesting agency any other information needed to process a possible claim.

Receiver

Receivers also have an important role in finalizing the shipment. Many people think a receiver's role is to open the shipment only, but he or she has a bigger role than that.

A receiver, also called a *consignee*, is the *final* destination of the cargo. The receiver may also be a central receiving point or temporary storage point for the final destination consignee. Regardless of the exact designation of the receiver, when a shipment arrives at the receiver and documentation is accomplished, the movement is complete.

Responsibilities

The receiver has a responsibility to ensure the shipment is *complete*. Upon delivery, the receiver verifies the shipment is complete by checking the actual shipment with the TCMD data or other documentation necessary to complete that action. If the shipment arrives without the necessary documentation, is damaged, or has extra or missing items, the receiver is responsible for reporting those discrepancies and initiating any inquiries necessary to properly recover or account for the shipment.

The receiver is also responsible for providing any special equipment used to transport, handle, or tie-down the equipment received with the shipment. If the shipment arrived with an RFID tag and it no longer requires one, the receiver is responsible for removing and deactivating the tag.

Just as the shipper is involved in tracking, diverting, and holding cargo, the receiver is also involved since that is where the cargo is going. It makes sense that the receiver will want to know where the cargo is and must initiate tracer action to find out. The receiver may also need to divert the shipment to a deployed component of his or her unit or may need to hold the shipment in place until the deployed component reaches its destination. There are many reasons for diverting or holding a shipment, but regardless of who initiates the action, the ACA must be involved in those actions.

Finally, if a TDR is initiated, the receiver must respond to requests for information to support the TDR just as the shipper does.

Other agencies

Shippers and receivers exist for every shipment within the DTS. Most shipments also involve one or more transshippers as well as other agencies. It really is a team effort to ensure a shipment arrives where it needs to go safely and quickly.

Transshipper

A transshipper is any transportation activity, other than the shipper or receiver, which receives, processes, forwards, or documents the transfer of a shipment between conveyances. There are several different types of transshippers for both surface and air transportation. For air transportation, you have already learned about APOE and aerial ports of debarkation (APOD). If you work at an aerial port, you are a transshipper.

Another transshipper you may deal with is a CCP. CCPs receive, consolidate, process, and forward cargo from multiple shippers, such as depots, vendors, and other authorized shippers within the continental United States (CONUS), who do not regularly have enough cargo to fill a 463L pallet for shipment to a single overseas agency or activity. Part II of the DTR outlines which types of shipments, geographical areas, and agencies are eligible to use a CCP. The Defense Distribution Depot, Susquehanna, Pennsylvania; the Defense Distribution Depot, San Joaquin, California; and the Fleet and Industrial Supply Center (FISC), Norfolk, Virginia are the only three DOD-designated CCPs.

If you are located at an APOE within the CONUS, you may receive cargo from a CCP for airlift. Since the cargo has been consolidated at the CCP, it will arrive in the form of an airlift-ready 463L pallet; an example of a pre-built pallet is an air line of communication (ALOC). As a cargo processor, it saves you time because you only have to in-check one 463L pallet as opposed to several individual pieces of cargo and you do not have to build and tie-down the pallet. It arrives already built and tied down.

You have many duties and responsibilities as a transshipper. Since the rest of this volume discusses these responsibilities in detail, we will not discuss them here.

Airlift clearance authority

ACAs normally do not physically handle cargo, but they do provide a *critical link* between the shipper, transshipper, and receiver. Each military service has several ACAs throughout the world that control cargo movement within the DTS. Appendix R in Part II of the DTR lists all the ACAs and the agencies or areas they service.

ACAs control cargo movement by providing shipment information to the air terminals, coordinating movement of classified cargo and courier material, and monitoring overseas retrograde cargo back into the CONUS. In addition, they provide critical services to the shipper and other transportation agencies by diverting, expediting, holding, and tracking cargo; provide movement and receipt information; assist the shipper in preparing and correcting shipping documents; determine if shipments are routed properly, and challenge shipments that do not meet airlift requirements.

When an ACA provides clearance, it does so well in advance of the shipment arriving at the terminal and provides all the necessary TCMD data to the APOE. Usually, ACA-cleared cargo arriving at the APOE is entered already into “advanced” status in the Global Air Transportation Execution System (GATES). This allows you, as the cargo processor, to quickly in-check the cargo because you do not have to enter the information yourself. As soon as you scan the cargo or enter the TCN, the rest of the shipment information automatically populates in the system.

With the exception of TP-4 cargo, the ACA considers an air shipment cleared if they have not challenged it by the hour/date entered in the ATCMD date-shipped field. The ACA must explicitly clear TP-4 cargo before they send it to the APOE. The ACA issues challenges by e-mail or message, which may be made at any time before the hour/day entered in the ATCMD. If the

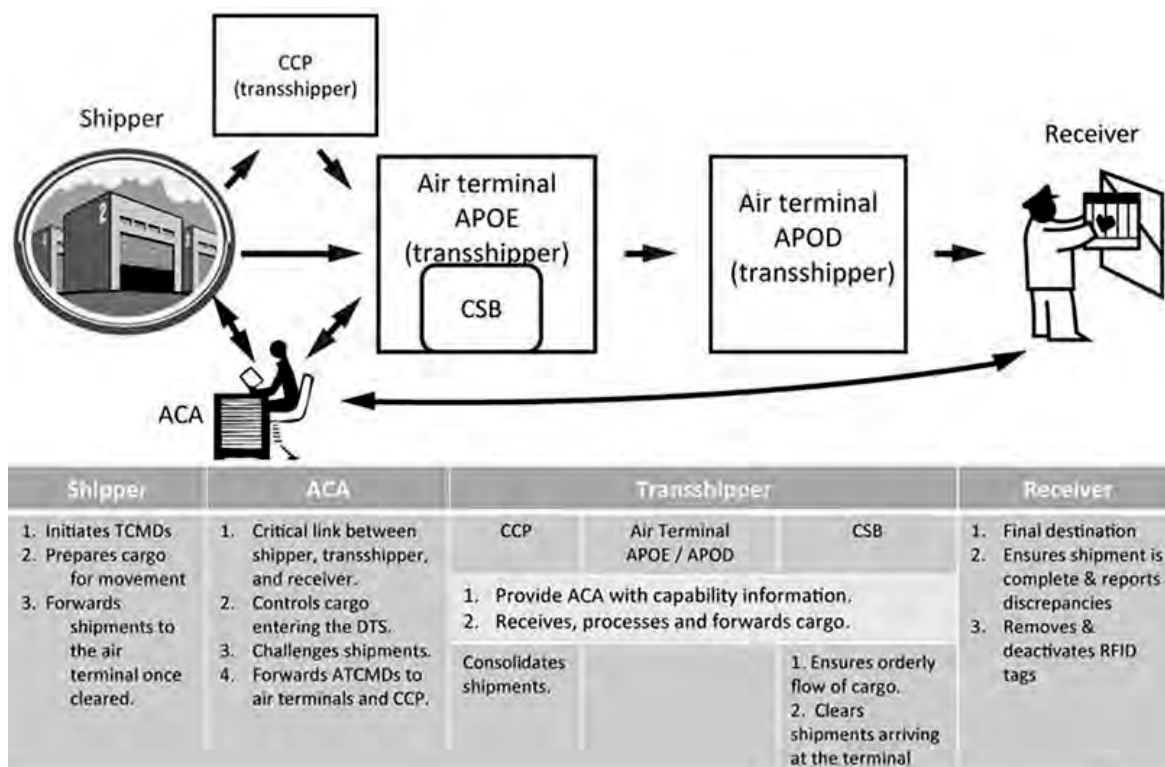
ACA challenges a shipment, the shipper must follow the ACA's instructions. If the ACA issues a challenge for TP-4 cargo, the shipper must request clearance with the applicable clearance authority for surface movement.

You may wonder why shipments need clearance to come to an air terminal or CCP. As mentioned previously, clearing shipments in advance aids in cargo receiving and aircraft scheduling. All transshippers, including air terminals and CCPs, must work closely with the ACA to inform them of their capabilities or what they can handle. For example, if a particular air terminal has a large backlog of TP-1 cargo destined for Japan and not enough aircraft scheduled to take it all out, it may not be wise for the ACA to clear TP-4 cargo for that location. In this case, the cargo would probably arrive faster if it moved by surface.

Customer service branch

At CONUS AMC APOEs, the customer service branch (CSB) works with the APOE to help with transshipment. Think of a CSB as an ACA that physically receives, processes, and forwards cargo and acts as an agent for the ACA. The CSB generally helps to ensure an orderly flow of cargo and advises the ACA of anything affecting an orderly and expeditious flow through the aerial ports. The CSB can track, divert, hold, or expedite cargo as directed by the ACA.

Occasionally, some shipments arrive at the air terminals without advanced clearance from the ACA. It is the CSB's responsibility to clear those shipments by coordinating with the ACA. Shipments may also arrive damaged or improperly packaged and certified. The CSB is also responsible for reporting any discrepancies to the ACA and coordinating a resolution with the ACA, AMC, and/or the shipper. This may mean the CSB repacks and recertifies the shipment for the shipper and, if necessary, bills the shipper for the services. The CSB may also initiate a TDR for the shipment. The CSB is responsible for processing any cargo with any discrepancies in a timely manner. We will discuss the CSB more in detail in a later lesson. Figure 1-1 illustrates generally how all of these agencies work together.



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Figure 1-1. Shipping process.

The information entered on the TCMD is either prime or trailer data. Prime data, which is the basic information of the shipment, is required for every shipment. Trailer data, which is the shipment's supplemental information, is only required for certain types of shipments. Figure 1-2 shows an example of a completed TCMD.

Part II, Appendix M of the DTR details how to fill out a TCMD, block-by-block. Let us go over what each block represents.

DD Form 1384, TCMD		
Block Number	Data	DTR Reference or Website*
1	Document identifier code (DIC).	Appendices M & DD.
2	Trailer, van, or container number.	Appendices M & QQ.
3	Consignor.	https://www.transactionservices.dla.mil/daashome (you will need to create an account).
4	Commodity/special handling code.	Appendices M, Z & AA.
5	Air dimension code.	Appendices M & BB.
6	POE code.	Appendices M & CC.
7	POD code.	Appendices M & CC.
8	Mode (transportation method type).	Appendices M & GG.
9	Pack (type).	Appendices M & UU.
10	TCN.	Appendices L & M.
11	Consignee.	https://www.transactionservices.dla.mil/daashome (you will need to create an account).
12	Transportation priority.	Chapter 203, Para B.3.
13	Required delivery date or expedited handling signal.	Chapter 203, Para B.3 and B.4.
14	Project code.	Chapter 203, Para B.5.
15	Date shipped code (hour and date).	Appendices M & RR.
16	Estimated time of arrival (ETA) code.	Appendices M & EE.
17	TAC.	Chapter 203, Para B.17. Appendices V through V-9. https://beis.csd.disa.mil (you will need to request access).
18-21	Optional data.	Dependent on shipment information.
22	Total number of pieces in the shipment.	Self-explanatory.
23	Total weight of shipment (in whole pounds).	Self-explanatory.
24	Total cube of shipment (in whole cubic feet).	L x W x H ÷ 1728.
25-27, a-k	Blocks for any transship point to log its receipt and shipping information.	Internal to transship points.
28-31	Blocks for the consignee to log its receipt information as well as the condition of the shipment and remarks.	Internal to consignee.
32-44	Trailer data entries	Appendix M, Tables M-9 through M-18.
*Some websites referenced require an account with the host site.		

Now look at the first four blocks so you know how to construct them. For this career development course (CDC), we will focus only on the codes for the prime data entries, but ensure you familiarize yourself with the information required for trailer data entries.

Document identifier codes

A DIC identifies the function and use of a document. DICs for TCMDs are built according to the type of shipment, the type of document, and the type of information contained on the document. You can find more information about DICs in Appendix DD of Part II of the DTR; however, to get the actual codes, this Appendix refers you to the following website: <https://trdmws.maf.ustranscom.mil>. The DIC consists of three positions:

1. First position—Always “T.”
2. Second position—This position signifies the type of shipment or document. The following table identifies some of the various codes you will see in the second position of the DIC.

Code	Explanation
A	Manifest header.
B	Accompanied baggage.
C	Defense Courier System.
D	Intraservice use only.
E	Ammunitions and explosives.
F	Unaccompanied baggage.
G	Mail from Postal Concentration Centers.
H	Household goods.
I	Vet Inspectable container.
J	Hazardous Materials (except ammunition and explosives or consumer commodities ORM-D [other regulated materials-domestic]).
L	Dunnage and lashing gear.
P	Privately owned vehicles (POV).
U	Equipment in sets or systems.
V	Government vehicles, trailers, wheeled guns, and aircraft.
W	Arms/weapons: does not include nuclear weapons or their components.
X	Shipments (including ORM-D) not otherwise covered above.

3. Third position—This position signifies the type of information that is on the document, and whether it is trailer data or prime data. This information varies between documents. The following table lists the codes for a TCMD.

Prime ATCMD Code	Air Manifest Document	Explanation
0	-	Prime document for release unit shipment (including empty SEAVAN, CONEX, etc.) not in a consolidation container.
1	A	Prime document for less than release unit shipment (including empty SEAVAN, CONEX) not in a consolidation container.
2	B	Prime document (header) for loaded roll on/roll off (RO/RO), SEAVAN, MILVAN, or air pallet (463L).
3	C	Prime document (header) for CONEX, unitized pallet load, or other consolidation container containing multiple shipment units.
4	D	Prime document for shipment units consolidated in a container (CONEX, SEAVAN, MILVAN, 463L pallet, RO/RO, or unitized pallet load).
5	E	Trailer document for cargo with outsize dimensions.

Prime ATCMD Code	Air Manifest Document	Explanation
6	F	Trailer document for identifying ammunition-round count and coding data peculiar to ammunition, explosives, and other HAZMAT.
7	G	Trailer document for listing the net explosive weight and lot number of ammunition and explosives.
8	H	Trailer document for listing personal property ownership information.
9	I	Trailer document for listing miscellaneous information both in general and as specifically identified in Appendix M.

Using this information, let's breakdown a DI code. Take for example, the DI code "TVB." We know the first position is always "T." The "V" signifies that we have a government vehicle of some sort. Finally, the "B" signifies this DI code is prime document data for an air manifest document for loaded RO/RO cargo. Decode TXA. The first position is always "T." The "X" signifies that the shipment is a type of shipment not otherwise covered in the second position DI code table. The "A" signifies that the shipment is prime document data for a less than release shipment not in a consolidation container.

Consignor/consignee

A six-character Department of Defense activity address code (DODAAC) is required to fill in each of these consignor/consignee blocks. You can find DODAACs at the following website:

<https://www.transactionservices.dla.mil/daasing/warning.asp>. If you already know the DODAAC, you can query it to find the clear text address; however, if you are searching for a DODAAC with only the clear text address available, you must obtain an account through the following website:

<https://www.transactionservices.dla.mil/daashome>. When the consignor or the consignee does not have an assigned DODAAC, use the sponsoring service code (e.g., F for Air Force, A for Army, M for Marine, N for Navy, Z for Coast Guard, etc.) followed by five zeros. If you use this type of format, you must also include a clear text address on the TCMD as trailer data. Please note that failure to obtain access to the DODAAC website is not reason to use F00000 (or any other service) as the DODAAC.

Air commodity and air special handling codes

The air commodity and air special handling codes are a two-position combination. The first position of the code identifies the commodity, and the second position identifies the nature of the commodity or how the shipment will be handled or treated. The specific special handling requirements are usually further identified in the trailer data (e.g., actual temperature control range or type of HAZMAT). The following table lists the air commodity codes.

Air Commodity Codes	
Code	Description
2	Arms/weapons (all types, including inert component parts).
3	Ammunition (all types) including inert component parts.
4	Explosives (any item not included in Code 3 above) including inert component parts.
A	Supplies and equipment for aircraft and aerial targets.
B	Construction materials.
C	Chemical corps items and all other chemicals not covered in other classifications.
D	Animals.
E	Engineer supplies, other than those listed under Code B.
F	Fuels and lubricants.
G	Printed forms, publications, drawings, etc.
H	Signal Corps supplies and equipment including radio, communications, and electrical equipment and supplies.
J	Unaccompanied baggage.

Air Commodity Codes	
Code	Description
K	Clothing (other than arms and chemical supplies), fabrics, leather, parachutes, etc.
L	DCS (Defense Courier Service) material.
M	Medical supplies.
N	Ship's parts, Navy.
P	Photographic supplies and equipment including training films.
Q	Plants, plant products, insects, mites, nematodes, mollusks, soil, meat (other than rations), animal products, vectors, and cultures of animal and plant diseases.
R	Rations and subsistence supplies.
S	Office and school supplies and equipment.
T	Household goods.
U	Mail (for mail, refer to Appendix AA to determine the special handling code).
V	Vehicles, machinery, and shop and warehouse equipment and supplies.
W	Any material, not otherwise specified, that may require special handling with special instructions identified in the DI T_9 trailer data. Primarily used with channel airlift 463L pallets.
X	Intelligence materials including maps, charts data, and information vital to military functions.
Y	Personnel services.
Z	Human remains (HR).

The air special handling code identifies how the item should be treated and handled to ensure proper transportation without damage to the item, its surroundings, people, or its security. The following table outlines the air special handling codes:

Air Special Handling Codes	
Code	Description
1	Highest sensitivity, Category I: Missiles and Rockets; Arms, Ammunition and Explosives. These items are not classified.
2	Highest sensitivity, Category II: Missiles and Rockets; Arms, Ammunition and Explosives. These items are not classified.
3	Moderate sensitivity, Class III: Missiles and Rockets; Arms, Ammunition and Explosives. These items are not classified.
4	Low sensitivity, Category IV: Arms, Ammunition and Explosives with this classification are not classified.
5	Highest sensitivity, Category I: Missiles and Rockets; Arms, Ammunition and Explosives with a classification of Secret.
6	Highest sensitivity, Category I: Missiles and Rockets; Arms, Ammunition and Explosives with a classification of Confidential.
7	Empty mailbags.
8	Highest sensitivity, Category II: Missiles and Rockets; Arms, Ammunition and Explosives with a classification of Confidential.
A	HAZMAT requiring hand-to-hand receipt.
B	Whole blood.
C	Material classified as "Confidential" but which is not highly sensitive.
D	HAZMAT (not required hand-to-hand receipt) including all regulated items other than special weapons and their components.
E	Aircraft engine, drained and purged.
F	Foodstuffs requiring normal refrigeration.
G	Engines (aircraft and vehicle), not drained or purged.
H	Special weapons, including hazardous components.
I	In-bond shipment.
J	Materiel normally hazardous rendered nonhazardous for shipment processing.
K	Materiel which must be accompanied by a military courier and, when required, under armed guard.

Air Special Handling Codes	
Code	Description
L	Sets or systems that must move together to the consignee.
M	Noncontrolled munitions excluded from Categories 1 through 4, which, although reflected as pilferable on the shipment release document, do not require protection other than that provided based on the class/degree and hazard/explosive.
N	Nonsensitive weapons excluded from the above categories and which, although reflected as pilferable on the shipment release/receipt document, do not require protection other than normally afforded items such as TVs, radios, hand tools, etc.
O	Do not use.
P	Cargo requiring protection from freezing.
Q	Extremely fragile items including delicate instruments.
R	Revenue.
S	Materiel classified as Secret but which does not meet Code 5 criteria.
T	Cargo requiring both normal refrigeration and hand-to-hand receipt.
U	Perishable cargo requiring refrigeration only.
V	Vaccine.
W	Highly perishable cargo requiring subfreezing refrigeration only.
X	Highly perishable cargo requiring subfreezing refrigeration and hand-to-hand receipt.
Y	Protected cargo, other than that defined by the other Special Handling Codes, including sensitive cargo, requiring hand-to-hand receipt and/or security precautions.
Z	No special handling required.

When the shipment is mail, indicated in the first position by the letter “U,” instead of using the air special handling table in Appendix Z to determine the second position, you must use the mail air special handling table located in Appendix AA of the DTR. This table will help you narrow down the type of mail being shipped.

Mail Air Special Handling Codes	
Code	Description
1	Registered, letter mail, command pouches, weapons system pouches, casualty report pouches, and priority parcels.
2	Military official mail (MOM) including second, third, and fourth-class mail marked MOM.
3	Space available (S/A) mail and parcel airlift.
4	Overseas destined and intracommand surface mail.
7	Empty mailbags.

Let’s break down a few commodity/special handling codes:

- **MU:** The commodity code table indicates that “M” is medical supplies, and “U” in the special handling table indicates that the shipment is perishable and requires refrigeration.
- **U1:** The commodity code table indicates that “U” is mail. If you recall, anytime this commodity code is used, you must use the mail air special handling table to determine what the second position represents. In this case, a “1” in the mail air special handling table indicates this shipment is registered, letter mail, command pouches, and so forth.
- **BZ:** The commodity code table indicates that “B” is construction materials, and the “Z” in the special handling table indicates that this shipment requires no special handling.

Now we will discuss the rest of the prime data entries for the TCMD up through block 24. Again, it is *not* important to memorize each code, but you should have a good idea of what information and codes the blocks contain and where to find the information to look up the codes.

Air dimension code

For all air shipments, use the air dimension code. It indicates whether shipments have one or more outsized dimensions (greater than 72 inches) and/or are consolidations, outlined by the following table:

Air Dimension Codes	
Codes	Description
A	Shipment is not a consolidation and does not exceed 72 inches in any dimension.
C	Shipment is a consolidation but does not exceed 72 inches in any dimension.
D	Shipment is a consolidation and exceeds 72 inches in one or more dimensions.
Z	Shipment is not a consolidation but does exceed 72 inches in one or more dimensions.

POE/POD

The POE and POD codes are air terminal identifiers or aerial port codes (APC), which are covered in Part II, Appendix CC of the DTR. These codes consist of three positions and identify locations of various air terminals around the world. Figure 1-3 is an excerpt from the Table Management Distribution System (TMDS) website, which contains many of the codes used for TCMD preparation. This website is located at <https://trdmws.maf.ustranscom.mil/>. The codes are listed in alphabetical order.

Mode (transportation method-type)

The transportation method-type identifies the specific method (e.g., motor, rail, airfreight, or parcel post) used for each segment of movement within the DTS. When preparing an ATCMD for submission to an ACA, the code selected identifies the method of transportation that will deliver the shipment to the POE.

Pack

The type of pack is a two-position code used to describe how the shipment is packaged. There are many different types of pack, so we will not list them all here. Appendices M and UU in Part II of the DTR provide the complete list of all the type of pack codes you'll see in daily operations.

TCN

The TCN is a 17-character number assigned to control and manage every shipment unit throughout the transportation pipeline. The TCN for each shipment is unique and not duplicated. Except for a misdirected shipment, a retrograde shipment will not be reshipped using the original TCN. A new TCN is created each time a shipment enters the transportation system. Appendix L in Part II of the DTR outlines several ways to construct a TCN, depending on the type of shipment it is. These types of shipments include the following:

1. Shipments in response to military standard requisitioning and issue procedures (MILSTRIP) requisitions.
2. Security assistance (SA) foreign military sales (FMS)/grant aid shipments.
3. Nonappropriated-fund (NAF) activity shipments.
4. Unit move shipments (mobility—see Appendix O for detailed instructions).
5. Shipments by the United States Transportation Command (USTRANSCOM) DCS.
6. Shipments of mail from postal activities.
7. Cargo shipments (except personal property) not detailed previously.
8. Personal property shipments.
9. Shipments of SEAVANs.
10. Channel air shipment of a 463L pallet.

11. Partial and split shipments.
12. Cargo shipments (not detailed previously) made by vendors/contractors at the direction of the DOD.

Table Management Distribution System - Microsoft Internet Explorer provided by USAF

Table Management Distribution System

UNCLASSIFIED

REG	SHIP	SHIP NO	SHIP DATE	SHIP NAME	SHIP TYPE	SHIP ORIGIN	SHIP DEST	SHIP STATUS	SHIP COMMENTS	SHIP TYPE	SHIP ORIGIN	SHIP DEST	SHIP STATUS	SHIP COMMENTS
GEQ	LEENING	-140	7	0171-08149	LEENING	UK	UNITED KINGDOM			E	WE			
GET	DIEPHOLZ	-140	7	0170-08123	DIEPHOLZ	GM	GERMANY			E	WE			
SOR	TKRIT EAST	-140	7	0427-08847	TKRIT	IZ	IRAQ			E	SW			
SRJ	CLEVELAND MUMI	-140	4	0468-00022	CLEVELAND	US	UNITED STATES	48		S	CO			
SRJ	SHMOFUSA	-140	8	0388-08413	SHMOFUSA	JA	JAPAN			N	NP			
TEG	CHURCH FENTON RAP	-140	7	0171-08052	CHURCH FENTON	UK	UNITED KINGDOM			E	WE			
TV6	CAMP GUERNSEY	-140	4	0304-00242	GUERNSEY	US	UNITED STATES	56		S	CO			
BOR	AL MUFRAH	-140	7	0445-08837	AL MUFRAH	IZ	IRAQ			E	SW			
SA4	LAWRENCE CO	-140	3	0408-00043	COURTLAND	US	UNITED STATES	01		S	CO			
SOR	ANARA NEW	-140	7	0445-08805	ANARA	IZ	IRAQ			E	SW			
ALA	UNSPECIFIED STATION	-140		GD5STALAZ01		US	UNITED STATES			N				
AAA	ANAA	-140	8	1207-08000	ANAA	FP	FRENCH POLYNESIA			N	SP			
AAB	ARRABURY	-140	8	1342-08000	ARRABURY	AS	AUSTRALIA			N	SP			
AAC	EL ARISH INTL	-140	7	0447-08020	AL ARISH	EG	EGYPT			E	EA			
AAE	ANNABA	-140	7	0345-08007	ANNABA	AG	ALGERIA			N	MD			
AAF	APALACHICOLA MILNI	-140	3	0467-00004	APALACHICOLA	US	UNITED STATES	12		S	CO			
AAG	ARAPOTI	-140	7	1313-08857	ARAPOTI	BR	BRAZIL			A	SA			
AAH	AACHEN-MERZERLACK	-140	7	0230-08412	AACHEN-MERZERLACK	GM	GERMANY			E	WE			
AAU	ARRAUS	-140	7	1140-08015	ARRAUS	BR	BRAZIL			A	SA			
AAK	ARANUKA	-140	8	TND5-AAK	ARANUKA	KR	KIRIBATI			N	CP			
AAL	AALBORG	-140	7	0151-08011	AALBORG	DA	DENMARK			E	WE			
AAI	MAANALA	-140	7	1299-08054	MAANALA	SP	SOUTH AFRICA			N	AF			
AAN	AL ANINTL	-140	7	0548-08865	AL AN	AE	UNITED ARAB EMIRATES			N	SW			
AAO	ANACO	-140	7	0771-08002	ANACO	VE	VENEZUELA			N	SA			
AAP	ANDRAU AIRPARK	-140	4	0468-00004	HOUSTON	US	UNITED STATES	48		S	CO			
AAQ	VITYAZEVO	-140	7	0249-08337	ANAPA	RS	RUSSIA			E	RU			
AAE	AARHUS	-140	7	0151-08016	AARHUS	DA	DENMARK			E	WE			
AAS	APALAPSILI	-140	9	0974-08820	APALAPSILI	ID	INDONESIA			N	NP			
AAT	ALTAY	-140	8	TND5-AAT	ALTAY	CH	CHINA			N	NP			
AAU	ASAU	-140	8	1119-08801	ASAU	WS	SAMOA			N	SP			
AAV	ALLAH VALLEY	-140	9	0855-08405	ALLAH	RP	PHILIPPINES			N	WP			
AAW	ARAXA	-140	7	1190-08018	ARAXA	BR	BRAZIL			A	SA			
AAZ	AL GHADDAH	-140	7	0660-08007	AL GHADDAH AL GHADDAH	YM	YEMEN			N	SW			
...	KING ABDULAZIZ NAVAL			

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Figure 1-3. TMDS excerpt.

We will *not* go over every way to construct a TCN—*only* the general construction for *most* types of shipments and mobility (unit move) TCNs. Let's start with the general construction. The 17-character TCN is essentially broken up into four parts: the DODAAC, Julian date, serial number, and suffix.

General TCN Construction	
Position Number	Description
1–6	Enter the DODAAC of the consignor/ordering activity, if assigned. If not assigned, enter the DODAAC of the facility where the consignee/order is located.
7	Enter the last digit of the calendar year in which the shipment is made or the year shown on the purchase order.
8–10	Enter the Julian date (day of the year) shown on the purchase order or the Julian date the TCN was constructed.
11	This character is unique to the type of shipment. In general, enter the alpha character (A–Z) that the shipper selects in compliance with the DTR. X is the default character.
12–14	This character is also unique to the type of shipment. In general, use the numbers 001 through 999 in sequence starting with 001 for each Julian date shown in positions 8–10. For example, if on Julian date 201, you make two shipments, you will use 001 and 002 in this block for the two TCMDs you prepare. On Julian date 202, you will start over with 001 and continue on, as necessary, for each shipment.
15	Enter the letter X unless the shipment ships from multiple locations. For multiple locations, identify each shipping point alphabetically: A—first location; B—second location; and so on. Do not use the letters I, O, or X.
16	Enter the partial shipment code (see explanation below).
17	Enter the split shipment code (see explanation below).
NOTE: The first three parts of the TCN for MILSTRIP shipments are normally the 14-digit requisition number found on other transportation documentation that accompanies the shipment.	

Mobility (Unit Move) TCN Construction	
Position Number	Description
1	Service code (A—Army, F—Air Force, M—Marine Corps, N—Navy, and Z—Coast Guard).
2–8	Army activities will enter a unit identification code (UIC) beginning with TCN position two and putting a \$ (dollar) special character in position eight. All other services will enter a unit line number (ULN) beginning with TCN position two and filling any unused positions with a \$ (dollar) special character.
9–10	Service use, except for code "CH" which is reserved to identify small units (10 tons of equipment or less) moving by air. Requires data entry; do not leave blank. Use zeros if no data available.
11–14	Shipment number, increment number, or serial number.
15	Enter a zero (0) here to show that this is a unit move TCN.
16–17	Split/partial shipment or complete shipment unit indicator.

The partial- and split-shipment codes in each type of TCN indicate whether a shipment unit is separated into increments and identify those specific increments if it is separated. In addition, the codes are used for actual piece control in the air system. The partial- and split-shipment codes are required to ensure the TCN is not duplicated. While the same letter codes are used for both partial- and split-shipment entries, the shipper makes the partial-shipment entry (position 16), and the transshipper makes the *split*-shipment entry (position 17). The letters "I" and "O" are not used.

Partial-shipment codes	X: Complete shipment unit not separated into increments (and containing 23 pieces or less). A: 1st increment of a partial shipment (and containing 23 pieces or less). B: 2d piece. C: 3d piece. ...and so on.
Split-shipment codes	X: Complete shipment consisting of only one piece. A: 1st piece of a shipment containing multiple pieces. B: 2d piece. C: 3d piece. ...and so on.

Look at some examples of partial- and split-shipment code assignments for air movement.

1. A shipment consisting of only one piece—XXX.
2. A shipment consisting of three pieces:
 - A. As it leaves the shipper together—XXX.
 - B. As it leaves the air terminal split:
 - 1st piece—XXA.
 - 2d piece—XXB.
 - 3d piece—XXC.
 - C. As it leaves the shipper partialled (divided) into three increments:
 - 1st increment—XAX.
 - 2d increment—XBX.
 - 3d increment—XCX.

Now we put it all together and decode the following general construction TCN:

SW3224 9032 X002 XAX

- **SW3224:** We already know that the first six positions of a TCN are the DODAAC of the consignor or ordering activity. This one happens to be the CCP in Tracy, California.
- **9032:** The “9” indicates this shipment was made in the year 2009. The “032” Julian date indicates this TCN was constructed on 1 February 2009.
- **X002:** This part of the TCN is unique to the shipper, but we know that “002” indicates this shipment is the second shipment of the day (1 February 2009) for this particular shipper.
- **XAX:** This last part of the TCN indicates the shipment is the first increment of a multiple-piece shipment that has been partialled (divided) by the shipper. We cannot tell from this minimal information how many total increments there are; only that this is the first one.

Priority and required delivery date

The shipper determines under which TP the shipment will travel. Each TP is assigned to a time-definite delivery (TDD) category, which sets the standards for how quickly the shipment should move for any given portion of the movement.

An RDD normally comes in the form of a Julian date and indicates when the shipment is required to arrive at its final destination. The shipper does not assign the RDD; the requisitioner (the orderer) assigns one only if the shipment must arrive by a justified date earlier or later than the standard delivery date (SDD). Some RDDs are not actually RDDs but instead signify that the shipment requires some sort of expedited handling.

Expedited Handling	
RDD	Description
TP-1	TP-1 (<i>expedited</i> transportation) is assigned to shipments in TDD category one and all shipments with an RDD. The RDD can be a traditional Julian date RDD, a blank RDD field, or one of the following expedited handling indicators: "999," "444," "555," "777," "N_," "E_." TP-1 shipments normally move by air.
999	An <i>expedited</i> handling requirement for nonmission capable, supply (NMCS) overseas customers or CONUS customers deploying within 30 days. This RDD is reserved for US forces.
444	<i>Expedited</i> service for customers collocated with the storage activity or for locally negotiated arrangements.
555	Exception to mass requisition cancellation, <i>expedited</i> handling required.
777	<i>Expedited</i> handling required for reasons other than indicated for 444 or 555.
N_	An RDD equal to "N_" (where "_" is any alphanumeric character or blank) indicates <i>expedited</i> handling due to an NMCS requirement for a CONUS customer.
E_	An RDD equal to "E_" (where "_" is any alphanumeric character or blank) indicates <i>expedited</i> handling due to an anticipated NMCS requirement for a CONUS customer.
TP-2	TP-2 (<i>expedited</i> transportation) is assigned to shipments in TDD category two with RDDs of "444," "555," "777," N_, or E_. It is also assigned to DOD shipments or an RDD Julian date that is eight days or less from the Julian date the shipment is being processed for CONUS customers or 21 days or less for outside the continental United States (OCONUS) customers. TP-2 shipments normally move by air.
TP-3	TP-3 (<i>routine</i> transportation) is assigned to DOD or TDD category three shipments with a Julian date greater than eight or 21 days (CONUS and OCONUS, respectively).
TP-4	(Considered <i>deferred</i> airfreight) AMC offers to move TP-4 cargo by air at surface rates and TDD standards; but AMC, the ACAs, the air terminal managers (ATM), and the shippers strictly control its use. It is moved as a <i>last priority only if there is room on a given aircraft</i> . At certain times during contingencies and high workloads, AMC may prevent the APOEs from clearing and accepting any TP-4 cargo. AMC ensures movement of TP-4 cargo as quickly as possible and takes appropriate action to ensure delivery to the customer does not exceed the TDD standards for routine cargo movements. If TP-4 cargo sits at an aerial port for 20 days, it is <i>frustrated</i> and the ATM can decide to send it through surface modes or upgrade it to TP-2.

Project code

The shipper determines if a project code is associated with the shipment by examining any type of source documents or contracts that apply to the shipment. The three-position project code identifies shipments that require special recognition and allows interested agencies to tally cost and other data for a particular project code. The project code must be repeated on all other transportation documentation. 9GF, 9GH, and BIT are all examples of project codes that support various DOD programs.

Date shipped

The date shipped/received code is used on advance TCMDs to notify the clearance authority of the expected date of cargo release to the carrier. The same code indicates the receipt date for in-transit data and may be used on other documents and where a date code is needed. There are two ways of constructing the code: one for surface and one for air.

Because air shipments usually are measured in hours rather than days, the date shipped/received code includes the hour as well as the actual day. The first position of the three-position code is a letter indicating the Greenwich Mean Time (GMT) hour (Zulu time). The last two positions of the code are the last two digits of the Julian day of the year.

Let us suppose a shipper is going to release his or her shipment to a carrier on 23 March 2009, at 1425. What would be the date-shipped code? First, find the time on the first table. The letter “Q” is the code for times between 1401 and 1500. Remember, these are GMT or Zulu times; if the shipper is dealing with local time, they will need to be converted to Zulu time. Next, find 23 March 2009, on the Julian date calendar. The Julian date is 082. Put the letter code and the last two digits of the Julian date together to get the date shipped code and you get “Q82.”

ETA

Shippers use the ETA code to indicate the number of days a shipment will be in-transit from the consignor to a POE. Using the ETA code and the date shipped code the POE is able to determine when the shipment will arrive. ETA codes are found in Appendices M and EE of part II of the DTR.

TAC

TACs are used in the shipping and transportation process to link movement authority, funding approval, and accounting data for shipments of cargo and personal property in the DTS. TACs consist of a four-position alphanumeric code and are validated every fiscal year (FY). The first position identifies the sponsoring military shipper service, DOD/non-DOD agency, or contractor who will be charged for all services performed for shipments within the DTS. The following table shows sponsoring service/agency and contractor codes:

TAC First Position	
Code	Assigned to:
A	Army.
B	Army (Security Assistance Program [SAP]).
C	Army (Agency for International Development (AID) shipments).
D	Air Force (SAP).
F	Air Force.
H	Other DOD and US Government Agencies.
J	Joint Task Force 8.
K	Marine Corps (SAP).
L	Marine Corps First-Destination Transportation.
M	Marine Corps Second-Destination Transportation.
N	Navy.
P	Navy (SAP).
S	Defense Logistics Agency (DLA) (to include SAP).
T	Contractors.
V	Defense Contract Management Agency.
W	Foreign governments under acquisition and cross-servicing agreements.
X	Government agencies not listed herein.
Y	JCS exercises.
Z	Coast Guard.

Each of the sponsoring services control how the other positions within the TAC are constructed.

Pieces, weight, and cube

The pieces, weight, and cube for each shipment must be determined. In all cases, they are expressed as whole numbers. The pieces in a shipment are those separate items that have not been used. For

example, a shipment may have 10 separate items counted as 10 pieces, but if those 10 items are banded together on a warehouse skid, they are counted as one piece.

The weight of a shipment is expressed in whole pounds. It is the total for all the pieces in the shipment to include the weight of the skid. Fractions or decimals are rounded to the next higher whole number, and numbers less than one are rounded to one.

The cube of a shipment is expressed in whole cubic feet and is the total for all the pieces in a shipment. To determine the cube of a shipment, multiply the length, width, and height together and divide that total by 1,728 ($L \times W \times H \div 1728$). Just like the weight, fractions or decimals are rounded to the next higher whole number, and numbers less than one are rounded to one.

203. Inspect and receive cargo

When a shipper presents cargo to an air terminal for air movement, it must be properly prepared. The air terminal must inspect all cargo presented to ensure it is “air-worthy” and ready for shipment. Shippers use a variety of publications to prepare, mark and label their cargo. Some of them include MIL-STD 129, *Military Marking for Shipment and Storage*, Air Force Manual (AFMAN) 24-204 *Preparing Hazardous Materials for Military Air Shipments*, and the DTR.

Originating cargo shipments normally arrive by truck, whether commercial carrier or military, so to inspect the cargo, you must download the shipments off the truck. Every piece of cargo should arrive properly prepared, marked, labeled, and with some sort of documentation (i.e., GBL/commercial bills of lading (CBL), TCMDs, truck manifests). You must *first* ensure the cargo offered to you is supposed to come to your air terminal. To do this, match up the TCN and other information on the actual item to the information on the documentation (e.g., the label and TCMD). Then verify the item matches the documentation, each piece of documentation matches each other, and it is destined for the air terminal. Also, verify the piece count. If the document says you are supposed to have five pieces, you should physically count five pieces. Everything you have in your physical possession should match what is on the document. You should screen the cargo to detect hazardous materials not identified by the shipper. Once you have verified the shipments are at the right place, all pieces on the document are accounted for, and all the documentation for each shipment *matches* the shipment and each other, you can move on to the rest of the inspection.

Damaged or pilfered shipments

Shippers have a responsibility to package their shipments properly so the material within them arrives safely at its destination without hurting people or damaging aircraft, facilities, and so forth. You, as a transshipper, have the responsibility to make sure the cargo that arrives is not visibly damaged, leaking, or missing items. You are not responsible for opening the item and doing an internal inspection, unless you are dealing with HAZMAT, which we will talk about in a later lesson. Doing an internal inspection of every piece of cargo would just not be possible in terms of time, repackaging costs, and maintaining shipper’s integrity. However, you must look at the outside of the container and ensure there is no visible leaking or damage. All packages must be closed and intact. Secure most mail with seals or locks *except* ordinary mail; US Postal Service (USPS)-restricted materials; and unpouched parcels with size, weight, contents, or conditions that prevent sealing or locking. You must also ensure there are no visible signs of pilferage (theft). If you do receive a package that appears damaged, pilfered, or leaking, you must use extra caution when handling those shipments and follow the appropriate safety and security procedures we outlined in volume one as well as those outlined by your unit.

Marking and labeling

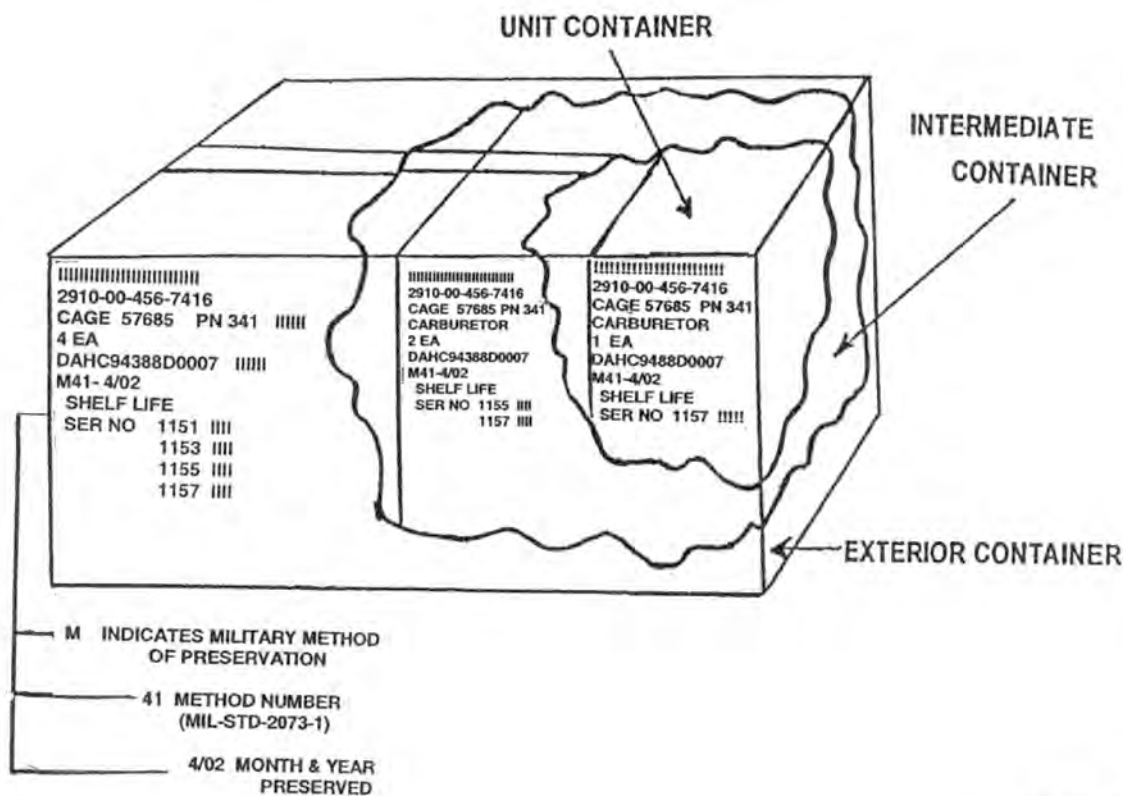
When shippers present cargo for movement to the air terminal, you must also ensure the shipment has the necessary markings and labels required for movement within the DTS. Marking and labeling are simply a form of communication. To move a shipment safely through the DTS, you must “listen” to what the markings and labels of a particular shipment say. For example, if a shipment has a marking

that says “THIS END UP,” that marking is “telling” you that there is something in that box, crate, or drum that may create an unsafe situation or damage the item if it is shipped or stored upside-down or on its side. Pay attention to all markings and labels.

MIL-STD 129 provides detailed guidance to shippers on how to mark and label cargo properly. Most of the markings and labels required for contract or vendor shipments are listed in the contract or purchase order, so there is no way for you to know which ones are required by that documentation. In general, ensure the removal or obliteration of old labels and markings so there is no confusion. Ensure there are no conflicting markings or labels (e.g., two “THIS END UP” markings pointing in opposite directions). There are several different types of markings and labels.

Identification markings and labels

An identification (ID) marking is a type of marking that helps everyone involved in the distribution or transportation process tell what the item is. Unless specifically exempted in the contract or purchase order, ID markings are applied to all DOD and contractor- or vendor-originated shipments. Most ID markings do not have one specific format, but contain such information as the NSN, gross weight, item description or nomenclature, and other information, if applicable. Figure 1-4 shows just one example of an ID marking.



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Figure 1-4. ID-marking example.

Handling markings and labels

Handling markings and labels will tell you *how to* treat and handle the shipment. There are too many different types to go over each one. The contract or purchase order for a particular shipment specifies the type of marking or label. The marking or label applied depends on the type of shipment.

Figure 1-5 shows some examples of the various types of handling markings and labels.

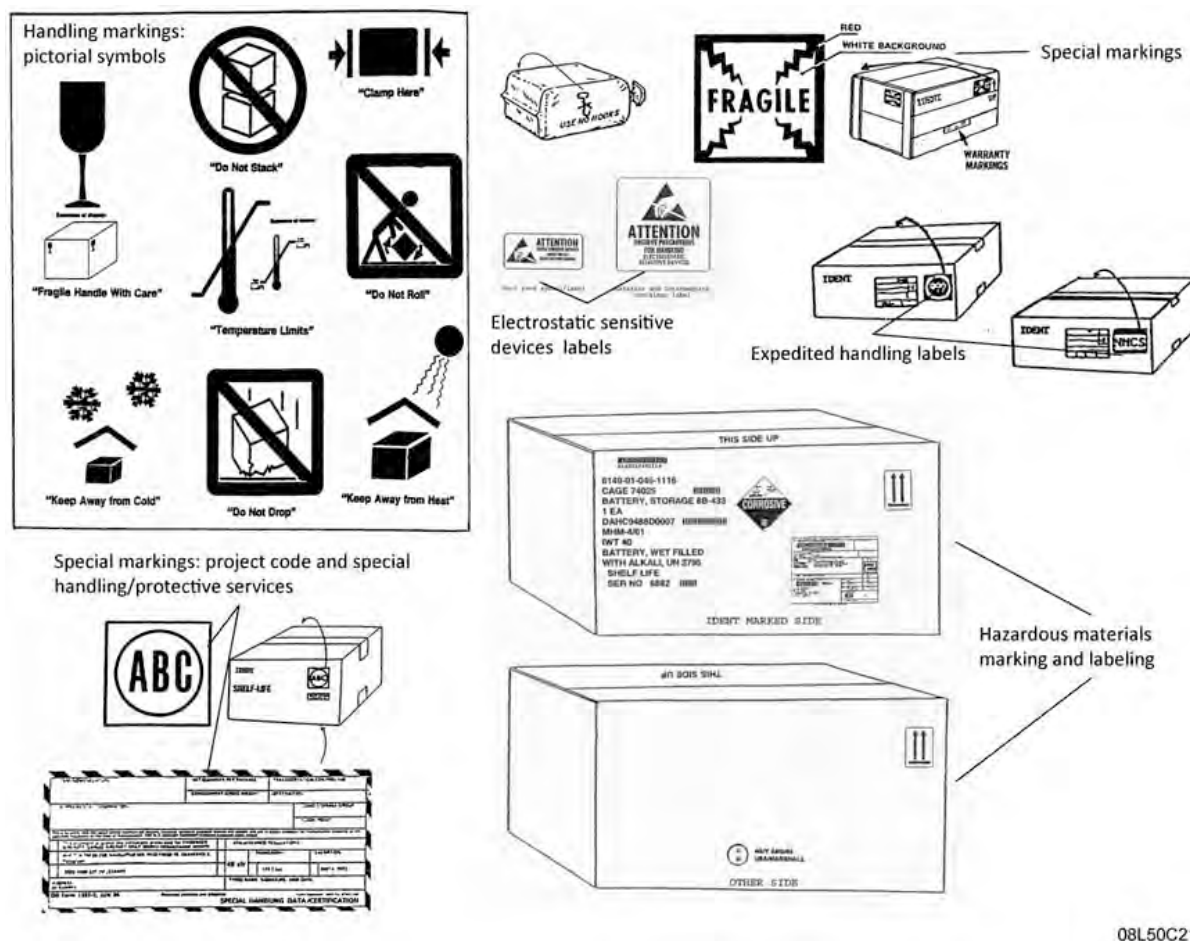


Figure 1-5. Examples of handling markings and labels.

Hazardous and special cargo requires extensive use of markings and labels, and we will go into detail about those in a later lesson.

Vehicles and rolling stock will have center-of-balance (C/B) and axle-weight markings. Anything over 10 feet long or having a C/B somewhere other than the center will have a C/B marking. You must ensure the presence of those markings for all shipments and verify the accuracy of those markings for any shipment over 1,000 pounds (lbs.).

Address markings and labels

Address markings and labels come in the form of DD Form 1387, Military Shipping Label (MSL). Address markings and labels identify (1) where the shipment came from, (2) where it is going, and (3) other pertinent information about the shipment. DOD-, contractor-, and vendor-shipping activities apply address markings using a bar-coded MSL for every piece in a shipment that enters the DTS. The labels must have *bar codes* for the TCN, the DODAAC, and piece number. Shippers can use any MSL format they wish as long as it complies with the guidelines in the DTR and MIL-STD 129. During cargo inspection and acceptance, you must ensure the required MSL is present and properly filled out on each piece. Figure 1-6 shows two examples of a bar-coded MSL: one for a standard cargo shipment and one for a mobility move.

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DD Form 1387, Military Shipment Label		
Block Number	Block Title	Required Information
1	TCN	Enter the 17-digit TCN.
2	Postage Data	Enter the TAC for any shipment other than mail. For mail, either attach the stick-on metered postage or enter the mail authorization, depending on the type of mail.
3	From	Enter the consignor DODAAC and the in-the-clear address of the shipping activity. For mail, include the ZIP code.
4	Type Service	Enter the in-the-clear text for the type of transportation service to the "Ship To" block. For example, enter "HHG" for household goods transportation service. Leave this block blank for mobility unit moves.
5	Ship To/POE	Enter the three-character APOE code and its in-the-clear address. For mail, include the ZIP code.
6	Trans Priority	Enter the applicable transportation priority or leave blank for unit move shipments.
7	POD	Enter the three-character APOD code. The in-the-clear address may be included. Leave blank for classified unit move and mail shipments.
8	Project	Enter the three-character project code, if applicable.
9	Ultimate Consignee or Mark For	Enter the in-the-clear address and DODAAC for the final destination (receiver) of the shipment.
10	Wt.	Enter the actual gross weight of the piece. If it is part of a multiple-piece shipment, enter the weight for ONLY this piece. Round to the next whole number (in lbs.).
11	RDD	Enter the RDD specified by the requisitioner, if applicable. Leave it blank for a classified unit move.
12	Cube	Enter the actual cube of the piece. If it is part of a multiple-piece shipment, enter the weight for ONLY this piece. Round to the next whole number (in cubic feet).
13	Charges	Leave blank.
14	Date Shipped	Enter the in-the-clear date in any format for the date the piece shipped. Do NOT use the date-shipped code used for the TCMD.
15	FMS Case Number	If the piece is FMS, enter the case identifier, as appropriate.
16	Piece Number	Enter the piece number assigned to this piece. For example, if this is the second piece of a three-piece shipment, enter "2."
17	Total Pieces	Enter the total number of pieces in the shipment. For our example from the last block, we would use "3" since this shipment contains three pieces.

Generally, items over 10 cubic feet should have more than one MSL attached. The MSLs and other markings should be large enough to read comfortably and in a conspicuous portion of the shipment to make it easy for transportation personnel to find. Adhesive labels and products do not stick well to or are not good for some shipments (e.g., vehicles, coils, or tires). In this case, the shipper can use a marker board or tag with the required markings to attach to the shipment with wire or twine. MIL-STD 129 specifies the various options, depending on the type of shipment and requirements.

Accepting cargo

When you inspect a shipment, you determine if it is ready for transportation within the DTS. If the shipment contains a discrepancy in one or more of the areas mentioned previously, it is not ready for shipment. You are the "gate keeper" for cargo entering the DTS, and it is critical for you to do a good job inspecting and in-checking cargo. Cargo processors who are complacent in their duties can create a chain of expanding problems for everyone in the transportation pipeline.

Refusal

If you have inspected a shipment and determined it is *not* ready for airlift, you must make some decisions. *If the shipper delivered the shipment to your air terminal directly, you can refuse to accept it.* The shipper must make the necessary corrections before offering it for shipment.

Shippers (consignors) rarely deliver their own cargo anymore. More often, cargo arrives by an intermediate carrier. This is when the consignor uses a carrier like United Parcel Service (UPS) or another company to deliver the cargo. In this case, you will be *unable to refuse* the shipment. If the shipment arrives damaged, document the damage so investigators will be able to narrow down where the damage occurred and take necessary actions. To do this, circle the correct item on the shipping documentation, write down exactly what the damage is in the space provided (or on the reverse), and accept and immediately *frustrate the cargo*.

Correction

Obviously, you cannot correct most damaged shipments, but what if the discrepancy is a minor documentation discrepancy? What do you do then? Again, evaluate the situation. If the discrepancy is minor and you are able to correct it on the spot, you must make every effort to do so. If the discrepancy is major and you are unable to correct it, you will frustrate the cargo instead.

Frustration

Frustrated shipments of cargo and mail are those that, due to some discrepancy or request of the shipper, cannot be accepted into, or continue movement within, the airlift system. There are many reasons to frustrate a shipment and the following table lists the reasons. You will be able to correct many of these discrepancies before the item is frustrated. GATES uses the codes listed for data management or annotating transportation documents for manual procedures.

Frustrating a Shipment	
Code	Reason
FR1	Cargo with documentation errors/problems.
FR2	Damaged shipments.
FR3	Request from ACA/CSB to hold, divert, or otherwise remove a shipment from the airlift system.
FR4	Request from US Customs to hold, divert, or otherwise remove (confiscate) a shipment from the airlift system.
FR5	Suspected pilfered shipments.
FR6	Explosive shipments awaiting clearance (other than diplomatic clearance).
FR7	Shipments received and in-checked/processed but cannot be located within the terminal.
FRA	Air movement short shipment.
FRB	Shipments without barcodes.
FRC	Direct vendor delivery shipments without labels.
FRD	Any cargo awaiting diplomatic clearance required by the Foreign Clearance Manual.
FRE	No matching consignee/APOD found during in-check.
FRG	Surface movement short shipment.
FRH	Household and/or unaccompanied baggage without labels.
FRP	Split shipment that is on-hand, but all pieces of the shipment cannot be moved on the same aircraft mission.
FRT	Erroneous TAC.
FRU	Unreadable barcodes.

If you are unable to fix a shipment, you are responsible for frustrating the shipment. There are two acceptable methods to frustrate an item. This depends on whether or not your station has GATES and/or GATES connectivity. You must complete an AMC Form 33, Report of Frustrated Cargo, at a

non-GATES location or when there is loss of connectivity. You complete the form in three copies. Ensure you properly document the discrepancies in the shipment on the form, and then attach the original copy to the number one piece of the shipment. Your work center or the section initiating the frustration action keeps the second copy for their files. Give the third copy to the CSB/ACA or other appropriate authority so they can correct the discrepancy and have one for their files. If you correct the shipment on your own, do not complete an AMC Form 33; it is only necessary if corrective action is required from the CSB/ACA. Figure 1–8 illustrates a completed AMC Form 33.

1. TCN SW81239350D001XXX		2. PCS 1	3. WEIGHT 90	4. CUBE 5
5. SHIPPER SW8123	6. GBL/TRUCK LIST NUMBER 8675309	7. DATE/TIME FRUSTRATED 20121129 15:23		8. FRUSTRATED BY SSgt Keeneye
9. REASON(S) FOR FRUSTRATION/REMARKS Direct vendor delivery from UPS with no documentation except an invoice from the company.				
AMT / CSB / SHIPPER SERVICE REPRESENTATIVE				
10. SIGNATURE <i>Ted Emend, CSB</i>		11. DATE/TIME RELEASED FROM FRUSTRATION 20121130 12:13		

AMC FORM 33, 19920601 (IMT-V1) REPLACES MAC FORM 33, 19790201, WHICH IS OBSOLETE 19920601 REPORT OF FRUSTRATED CARGO

08L50C24

Figure 1–8. AMC Form 33, Report of Frustrated Cargo.

Filling out the AMC Form 33 is self-explanatory; however, the following table discusses the various blocks of the form.

AMC Form 33, Report of Frustrated Cargo	
Block Number/Title	Data Entered
1. TCN	Transportation control number.
2. PCS	Number of pieces in the shipment.
3. Weight	Weight of the shipment.
4. Cube	Cube of the shipment.
5. Shipper	DODAAC of consignor.
6. GBL/Truck List Number	The manifest number (truck, GBL, air) of the document on which the shipment arrived.
7. Date/Time Frustrated	Date and time the cargo was frustrated.
8. Frustrated By	The name of the person who frustrated the shipment.
9. Reason(s) for Frustration/Remarks	Enter, in detail, all the reasons why the shipment was frustrated and any other pertinent information.
10. Signature	The signature of the CSB/ACA/other agency representative who released the shipment back into the airlift system.
11. Date/Time Released from Frustration	The date and time all discrepancies were corrected and the cargo was entered into the airlift system.

Once you fill out the AMC Form 33 and attach the original copy to the number one piece of the shipment, you then place the shipment in the area designated for frustrated cargo. However, you *do not* need to place a printed AMC Form 33 on the frustrated shipment as long as the shipment is frustrated in GATES and placed in the designated frustrated cargo area. Remember though, even if you are able to use GATES to frustrate the shipment, if you cannot place the shipment in a designated

frustrated cargo area, you will need to attach the required printed AMC Form 33 to the item. Each air terminal should have an area designated for frustrated general cargo as well as frustrated hazardous and special cargo. The area(s) for hazardous and special cargo must meet the safety and security standards required for the type of shipment being frustrated.

CSB/ACA will monitor these areas and ensure prompt correction of the discrepancies listed on the original AMC Form 33, as well as any others they find during the course of correction. Once the shipment is corrected, CSB/ACA makes the necessary entries on the original AMC Form 33, removes the form from the shipment, releases the cargo from frustration status, and places the shipment in the proper location for onward movement. CSB/ACA returns the original AMC Form 33 to the work center that frustrated the shipment. The work center *compares* the original form with the one they have on file to *make sure* all the listed discrepancies are corrected and files them *both* in accordance with (IAW) applicable policies and directives.

204. Performing receipt and in-checking cargo

If a shipment comes in without any discrepancies or you are able to correct the minor discrepancies, you will accept the shipment into the DTS and in-check the cargo for further processing. Detailed manual receipt and in-check procedures vary, depending on your location, but generally, some procedures are the same.

Originating cargo and mail arrives with an original and duplicate TCMD (or GBL/CBL, waybill, or manifest). Write the GMT hour code and last two digits of the Julian date of arrival in the appropriate blocks of *both* TCMDs. The time and date entered in this field starts AMC possession time and establishes system entry time (SET). Sign the second copy of the TCMD and return it to the carrier as a receipt. Use the original TCMD to process the shipments into and through the military airlift system.

When using *automated procedures* at automated stations, input the TCN into the system to match with the ATCMD submitted earlier from the ACAs. If the ATCMD is on file, the complete TCMD is readily available within the system for further processing of the shipment. When no ATCMD is available (called a “no-hit”), contact the CSB/ACA for clearance and system input. CSB/ACA uses GATES or another automated system to pull up lists of all the “no-hit” shipments and takes corrective actions with shippers responsible for them.

To determine *which cargo to process first*, use the destination, transportation priority, and SET. Remember, the SET is established when you receipt for the cargo by writing the GMT hour code and last two digits of the Julian date on the TCMD or other documentation. When the SET is equal for two or more shipments, use the transportation priority and expedited handling indicators (e.g., 999, N__, E__, 777, 555, 444) and the RDD to determine which shipments to process first. The receipt time for entry into the airlift system at the originating station is the time the shipment was removed from frustration status.

All cargo/mail, regardless of priority, is processed as soon as possible, *not to exceed six hours* upon receipt.

When you must *split shipments*, compute the number of pieces, weight, and cube of each portion of the shipment, and prepare a TCMD for each one with the appropriate split-shipment indicator (e.g., XXA, XXB, etc.). Place each TCMD in the cargo on-hand file. Make the changes on the MSL to reflect the corresponding split indicated on the TCMD and verify the weight and cube of each piece. Automated stations reprint a new MSL to attach to each piece.

To *finalize the receipt of a shipment*, write the warehouse location or assign a pallet identifier in block 25c of the TCMD for items being palletized. In addition, if your receipt document was something other than a TCMD (GBL/CBL, manifest, etc.), transcribe the GMT hour code and last two digits of the Julian date in the appropriate field on the TCMD and enter eligible shipments into the movement-ready, on-hand file.

When using manual cargo processing procedures, it is important for you to keep very detailed records and maintain immaculate on-hand files so your cargo processing operation runs smoothly.

Sometimes cargo is received, in-checked, processed and then cannot be located in the terminal after subsequent inventories. This cargo is considered “can’t locate” cargo. First, conduct a tracer action; this helps to determine if the cargo was receipted for and/or see if the cargo has already been moved by air or surface. Next, conduct a thorough check of the facility.

Notify CSB/ACA and your records section. Records will be able to review overshipment reports from other stations. If not identified on overshipment reports, a request for information (RFI) using DD Form 361, Transportation Discrepancy Report, is initiated and sent to consignee, up-line, and down-line stations. If tracer action and RFI fail to locate the shipment after 10 duty days, consider the shipment lost. We will discuss lost shipments in the next lesson.

205. Processing in-transit, landbridge, and terminating cargo and mail

Handling in-transit, landbridge, and terminating cargo and mail is nearly the same as handling originating mail and cargo, but you must follow some other procedures to ensure success. You still must ensure the shipment is *not* damaged, leaking, or pilfered. Those types of discrepancies can happen at any time throughout the shipment. You must still make sure the piece has the proper documentation, such as the TCMD and MSL. Occasionally, those types of things are overlooked; however, once discovered, you need to correct or frustrate it as soon as possible, so the shipment can be reconciled. It is possible for a shipment to leave with all the proper documentation but arrive somewhere without it so it is important to check for all of those things when dealing with in-transit, landbridge, and terminating cargo and mail. This lesson will focus more on the specific manual procedures unique to each type of shipment.

In the last lesson, you were the cargo processor for originating cargo. Switch your focus now and become the cargo processor for in-transit, landbridge, and terminating cargo. The cargo has already entered the DTS somewhere else and the aircraft carrying it may have been downloaded or, in the case of some in-transit cargo, it may be left on the aircraft. It is your job to receive this cargo and decide what to do with it. That is what we will discuss in this lesson. Before we do that, we need to take a quick look at the differences between in-transit, landbridge, and terminating cargo.

In-transit, landbridge, and terminating cargo

Although most procedures for processing these types of cargo are the same, there are some unique characteristics of each type of cargo. The following table shows a basic definition of each.

Cargo Type	Definition	Characteristics	Handling procedures
In-transit	Cargo transits your station and continues on in air status.	May or may not be removed from inbound aircraft, or may be transferred to different aircraft.	Inventoried by Air Terminal Operations Center (ATOC). May be inspected for airworthiness by airfreight personnel.
Landbridge	Cargo moving by commercial air or surface transportation from one port to another where GATES capabilities exist on both ends (AMCI 24-101, V11 para 32.2.8).	Can accomplish this by air or surface. Certain rules apply.	Treated similar to terminating cargo, processed in “Landbridge” mode in GATES.
Terminating	Cargo’s final destination (APOD) is your station.	Will continue to ultimate consignee by surface.	Processed with “Terminating” cargo procedures.

In-transit cargo may or may not be physically removed from the inbound aircraft. If removed from the inbound aircraft, it may be for aircraft maintenance reasons or to accommodate adding originating cargo.

Landbridge cargo is actually similar to terminating cargo because landbridge cargo is offloaded from the aircraft just as terminating cargo. The difference is how it is processed and how it continues to its final destination. Landbridge cargo may move by air across the CONUS on positioning, de-positioning, or opportune airlift if scheduled within 24 hours of arriving at your station. For example, a shipment arrives at Dover AFB, Delaware with an ultimate destination of Hickam AFB, Hawaii. The shipment could move via opportune air (24-hour rule) to Travis AFB, California as long as the mission continues to Hickam. If this is *not* possible within the 24-hour threshold, then the shipment would move by surface to Travis to await airlift to Hickam.

Terminating cargo is the cargo's final destination (APOD) or your station. Understand that the shipment has an ultimate consignee address, which may be on your station or could be a local address off station. In either case, the shipment continues by surface.

Cargo manifest receipt procedures

When an aircraft arrives on station with cargo, an ATOC representative goes to the aircraft to retrieve the cargo manifests. He or she also “walks” the aircraft to verify which cargo is actually on the aircraft and determine which cargo will be downloaded. At manual stations or when a manual cargo manifest has been used, the ATOC representative records the GMT (not the code—the actual time) and Julian date of aircraft block time in the upper right-hand corner on copies of the inbound manifests and delivers a copy and any accompanying documentation to the cargo processing function. GATES manifests do not require this information as this process occurs automatically when information control inputs the actual arrival and block times into GATES. Figure 1-9 shows an example of a GATES manifest. Figure 1-10 shows the manual version, DD Form 1385, Cargo Manifest.

UNCLASSIFIED FINAL AIR MANIFEST															ATOC 0345 Z / 136		FCN: 0014DC628									
PREPARED: 00 FEB 05 22:265 < 019 > CHALK-NO: 034084																										
DIC	CARR	A/C-NO	HDS	ACFT	APOD	MD	MR	CLEAR TEXT DESTINATION	MISSION-ID	MANIFEST DATA	WEIGHT	CUBE														
TA	436AH	70043	005B	OWO	F	KH	YONOTA AB, JA	PBA057900035	SUU 0 C 00224		911	910	71	51												
PE	DIC	HDR	CNSHORE	HDS	CE	D	FOR	POD	M	MR	-----TCN-----	CNSHORE	F	RED	FBJ	SET	ETA	TAC	PCS	WGT	CUBE	NBR	REMARKS			
1	TAR	ACL	A36	IA01	RMS	OKO	F KH	9018 L	PC	G		FM4002	1	9	76	44	H	10	A	(11)	(911)	(910)	(71)	(51)	(1266)	(1265)
	TXF	ACL	A36	FB4311	KEA	SUU	F KH	FB5604	5132	0345	XXX	FB5604	3	134	SBE	C38		N123	1	25	8	SC				
	TXF	ACL	A36		KEA	SUU	F KH	FB5604	5132	0345	XXX	FB5604	3	NHSH												
	TXD	ACL	A36	FB4311	AE A	SUU	F KH	FB5604	5133	0324	XXX	FB5604	2	135	SLA	J34		FBUT	4	71	30	SC		S/S		
	TXF	ACL	A36		AE A	SUU	F KH	FB5604	5133	0324	XXX	FB5604	2	NHSH												
	TXD	ACL	A36	FB4311	PE A	SUU	IWA	F KH	FB5640	5133	0222	XXX	FB5640	2	135	SGB	K34		FBUT	3	120	12	SC			
	TXF	ACL	A36		PE A	SUU	IWA	F KH	FB5640	5133	0222	XXX	FB5640	2	NHSH											
	TXD	ACL	A36	FB4312	AE A	SUU	IWA	F KH	FB5640	5134	0101	XXX	FB5640	1	999	SER	D36		FBUT	2	630	18	SC			
	TXF	ACL	A36		AE A	SUU	IWA	F KH	FB5640	5134	0101	XXX	FB5640	1	NHSH											
	TXD	ACL	A36	FB4310	GE A	SUU	ORD	F KH	FM4002	5134	0432	XXX	FM4002	1	999	SGO	C36		N123	1	65	3	SC			
	TXF	ACL	A36		GE A	SUU	ORD	F KH	FM4002	5134	0432	XXX	FM4002	1	NHSH											
	TXD	ACL		FE2016	SUU	OKO		FB6548	0005	0002	XXX	FM6521	1	999	XTR					1	70	10		O/S		

ON THE BACK:
FB5640 5134 0101 XXX jc# 2/2
Received Damaged (tg) side of cargo crushed)

SUMMARY TOTALS FOR LOOSE CARGO:				TOTAL PICES: 0				TOTAL WEIGHT: 0				TOTAL CUBE: 0			
TOTALS FOR THIS MANIFEST:				TOTAL PICES: (11) 8				TOTAL NET WEIGHT: (911) 910				TOTAL GROSS WEIGHT: (1266) 1265			
				TOTAL TARE WEIGHT: 355				TOTAL CUBE: (71) 51							
UNCLASSIFIED															
PERSONAL DATA: (PRIVACY ACT 1974)															

FCN: 0014DC628

08L50C26

Figure 1-9. GATES cargo manifest.

AIRCRAFT DATA		DEST CODE		REF		DESTINATION		MISSION DATA		PLN WT		ALW CL		MANIFEST ID		PAGE NO	
CARRIER	AC NO	AC MODEL	RMS	YC	RAMSTEIN AB, GE	NO	SV	DATE	2400	177	STA	CHS	R	C	00531	1	
DATE SALED		VOYAGE DOCUMENT NO		POB		VESSEL NAME		STATUS		TRUCK NO		REMARKS		PAGE NO			
DOC ID		VEHICLE TRAILER OR CONTAINER NUMBER		DOC CODE		CAR-DO EXC		PORT OF DISCH		TYPE PACK		TRANSPORTATION CONTROL NUMBER		CONSIGNEE		P R I O R I T Y	
TAB		ZUT		K71/50				CHS		RMS		FJM		9271L		1	
TXD		ZUT		FD2020		Q73		AZ		CHS		AYB		FJM		N00651	
TXD		ZUT		SW3123		K71		MZ		CHS		RMS		FJM		SW312392708005XAX	
TXD		ZUT		FD2020		C72		CZ		CHS		MHZ		FJM		FD202092659928XAX	
TXD		ZUT		SW3100		L71		RZ		CHS		KW1		FJM		SW310992710000XAX	
TXD		ZUT		SW3224		K71		SZ		SUU		RMS		FJM		FB525092707765XAX	
TXD		ZUT		FD2020		AZ		CHS		RMS		FJM		FD202092659928XAX		FB5250	
TOTALS		13		2400		177											
DATE		1 Oct 12		SIGNATURE OF CARGO AGENT		DATE		9 Oct 12		SIGNATURE OF UNLOADING AGENT		DATE		9 Oct 12		SIGNATURE OF RECEIVING AGENT	

DD FORM 1385, NOV 78

08L50C25

Figure 1-10. DD Form 1385, Cargo Manifest (manual).

If you are using GATES, you can see in the system what is coming off the aircraft or continuing on before you see the printed manifests or the actual cargo. Using this information, you can see which cargo has the highest priority in order to process it first.

When *processing cargo manually*, you have to wait until you receive the printed manifest. Then you review it and determine which cargo to process first. All cargo and mail is offloaded and processed for onward movement within six hours of aircraft block time.

There are times when an aircraft load arrives without cargo or mail manifests. The ATOC representative conducts a thorough search of the aircraft to verify they are missing and contacts the manifesting station to get the manifest header information and the manifests sent. When this happens, you cannot just wait for the manifests because they could take some time. Instead, you must visually inspect all cargo shipments for anything that requires immediate action, prepare a substitute manifest (DD Form 1385) for these items, and start processing anything that requires immediate action. When other documents are missing, prepare a substitute TCMD or manifest to allow for the delivery of the cargo to the receiver until the missing documents are found. Once that is complete, hold the remainder of the load intact to await the arrival of the manifest. If, after six hours, you do not receive the manifest, break each pallet down and take appropriate information from the shipping labels.

For the times when you do actually receive manifests, review them to determine which cargo is high priority, which cargo is in-transit, which cargo needs landbridging, and which cargo is terminating at your station. Use AMC Form 156, Terminating Cargo/Mail Manifest Control Log, to log *all* manifests that terminate at your air terminal. This form is filed by month. You must be very careful *not* to log any thru-load manifests you may have received; *log only terminating manifests*. Follow figure 1-11 as we go through the blocks of the AMC Form 156.

AMC Form 156, Terminating Cargo/Mail Manifest Control Log	
Block Number/Title	Information
1. Manifest	Enter the complete manifest number, including station, type of manifest (cargo or mail), and number.
2. Mission Number	Enter the complete mission number.
3. Date and Time Aircraft Arrival	Enter the local date and time of aircraft arrival. Date format is YYYYMMDD.
4. Cargo/Mail Data	Enter the total pieces, weight, and cube on the manifest.
5. Date and Time to Cargo Processing/Special Handling	Enter the local date and time that cargo processing or special handling personnel received the manifest. The person receiving the manifest initials in the space provided.
6. Date and Time to Records	Enter the local date and time the manifest was sent to records. The person receiving the manifests initials in the space provided.
7. Remarks	Enter any remarks about the manifest in the space provided, such as customs hold, short shipments, or overshipments.

[illegible]

Figure 1–11. AMC Form 156, Terminating Cargo/Mail Manifest Control Log.

Once the cargo is downloaded from the aircraft and physically available to you, manually check cargo/mail against the accompanying manifests and other documentation to ensure each shipment unit is complete and properly documented. Perform a visual inspection of all cargo/mail to ensure it is packed, marked, and labeled properly. Verify the outside dimensions, weight, and C/B markings for all items over 1,000 lbs.

When performing the visual inspection, you may encounter damaged, leaking, and improperly documented shipments. You may encounter other shipment discrepancies during the process of

receiving and processing in-transit or terminating cargo. You can discover these types of irregularities at any time in the transportation process, and *most of them must be frustrated upon discovery*.

Overshipments

Sometimes, cargo not listed on the manifest arrives at the air terminal. This is called an *overshipment*. For these types of shipments, add the shipment information to the appropriate manifest on the last page below the cargo totals (i.e., total pieces, weight, and cube). Use additional paper, if necessary, and attach to original manifest. *Hand write* “O/S” in the right-hand margin of the manifest immediately following the handwritten entry. Take care to assure the information transcribed from the DD Form 1387 (MSL) to the manifest is the same and is legible. Change the totals of each manifest to reflect the adjusted totals. Ensure you annotate the overshipment on the appropriate manifest. For example, if the piece is mail, it should go on the mail manifest, not a cargo manifest.

If no manifest accompanies the shipment, prepare an inbound substitute manifest (DD Form 1385), indicating the station originating the shipment as the manifesting station. If you can see that the shipment has been transshipped at an en route station, indicate that station as the manifesting station. Annotate this manifest with all information contained on the DD Form 1387 (MSL), and also annotate GMT hour and date code of aircraft arrival (block time) in the upper right-hand corner. Annotate the manifest with “overshipment” and enter the totals to reflect totals actually received. This includes the manifest and pallet headers, if applicable. Forward the manifest to the appropriate section to start the overshipment reporting process. Figures 1-9 and 1-10 show examples of an overshipment entry on a manual and automated manifest.

Short shipments

Sometimes, cargo listed on the manifest does *not* actually arrive at the air terminal. This type of cargo is considered *short-shipped cargo*. Whether all or part of the shipment is missing, it is still short-shipped. For these types of shipments, *circle* the missing shipment line item on the manifest. *Hand write* “S/S” on the right-hand margin of the manifest immediately following the circled line item. Change the totals on the manifest to reflect totals actually received. This includes the manifest and pallet headers, if applicable. Figures 1-9 and 1-10 show examples of a short-shipment entry on a manual and automated manifest. Forward the manifest to the appropriate section (usually records and reports) to start the short-shipment reporting process. See the following table for short-shipment messages.

Short-Shipped Cargo	
Types	Disposition
Priority Shipments (signature service, perishable, registered mail, mission capable/very, very important parts (MICAP/VVIP))	Send message to APOE within 12 hours of aircraft arrival.
General	Send message to APOE within three duty days of aircraft arrival.

Lost shipments

Sometimes cargo *cannot* be found, even after exhausting all efforts. If after conducting tracer actions and first and second attempts of messages to consignee/APOE of receipt or nonreceipt fail to locate a shipment, further action must be taken. If the shipment is still unaccounted for after 30 calendar days of initial discrepancy; initiate an RFI, using DD Form 361, filled out IAW 4500.9-R, DTR, Part II, Chapter 210; and send to consignee.

Pilfered shipments

When a shipment arrives at a station and its condition indicates possible pilferage (e.g., cases broken open, mail sacks torn or cut, etc.), the ATOC duty officer/senior controller *initiates* an immediate

investigation to determine if pilferage has indeed occurred. Usually, the ATOC representative makes an immediate report, by telephone, to security forces (civilian equivalent), followed by a formal written report within 24 hours. You may be asked to provide some of the information for the report if this happens, so you should know the procedures. AMCI 24-101, Volume 11, *Cargo and Mail Policy*, outlines the format for the report. Upon release of the shipment by the security forces, the airfreight officer/superintendent coordinates with the CSB/ACA regarding what to do with the pilfered shipment.

Confiscated shipments

A confiscated shipment is a cargo/mail shipment within the DTS that is removed due to pilferage, spoilage, suspicion of containing illegal items, and so forth. When a cargo/mail shipment is confiscated, the air terminal obtains a receipt from the confiscating agency on a TCMD as if the shipment were terminating. Annotate the document with the reason the shipment was removed from the AMC system. Advise the consignor, consignee, and headquarters (HQ) AMC that the shipment has been confiscated by email, fax, or priority message.

If the confiscating agency releases the shipment within 15 days, then document and process the shipment as an in-transit shipment and notify the consignor, consignee, and HQ AMC that the shipment has been released for airlift to destination.

If the confiscating agency *does not release* the shipment within 15 days, the air terminal that confiscated the shipment prepares a DD Form 361 advising the consignor, consignee and HQ AMC of the confiscated status so action may be taken.

Processing and in-check procedures

For *loose in-transit cargo and mail*, enter your location and the date received in the appropriate blocks of the TCMD. When the shipment is processed completely for onward movement, enter the GMT hour code, last two digits of the Julian date, and the two-digit warehouse-bay location in the appropriate fields of the TCMD. Do not change the APOE on the prime TCMD unless a non-Transportation Capital Working Fund (TWCF) mission received the cargo/mail. Change the APOD when your air terminal is listed as the APOD. In this case, change the APOE to reflect your air terminal and the APOD to reflect the final air terminal that will receive the cargo for termination. These changes are necessary to ensure billing occurs for each segment of the movement. Place the cargo in the correctly identified warehouse-bay location for further processing.

For *loose landbridge and terminating cargo and mail*, enter the same information on the TCMD discussed previously for in-transit cargo. The GMT hour code and last two digits of the Julian date in this case represent the time the shipment is processed completely for turnover to the receiving agency. Place the cargo in the correctly identified warehouse bay location.

For *in-transit pallets destined for a single location*, you do not need to remove the nets, tie-down, or RFID tags. Inspect the pallet and its contents for airworthiness and verify the documentation is correct. Ensure the DD Form 2775, Pallet Identifier, is correct and re-placard the pallet if necessary. Assign a grid location, “cap” the pallet, and place the pallet in the assigned grid location. Do not change the APOE field of the pallet identifier unless the cargo/mail was received on a non-TWCF mission.

For *in-transit pallets with mixed destinations and all terminating pallets*, break them down to distribute the cargo appropriately. Remove the nets or other forms of tie-down that may have been applied and check them for serviceability. Place them in the designated storage area. If an RFID tag is attached to the pallet, remove it and flip the battery around to make the tag inoperable. Do not remove the RFID tags from pallets that are not broken and will be moved intact to their final destination (e.g., ALOCS and pure pallets). Place the tag in the designated area to reuse for other pallets.

To continue manually processing these types of pallets, follow the same manual procedures for processing loose cargo. Ensure each shipment has no discrepancies, make the necessary annotations

on each TCMD, and place the cargo in the appropriate warehouse-bay location either for onward movement or for release to the receiving agency.

Cargo movement operations system

The cargo movement operations system (CMOS) is an installation transportation office/traffic management office (ITO/TMO) system. This system integrates computer hardware, software, and communications to effectively plan, document, and manage outbound and inbound cargo and passengers; and to plan, schedule, and monitor the execution of transportation activities in support of deployment and reception of forces. It also provides warfighters with an end-to-end distribution capability and real time in-transit visibility (ITV) during all passenger and cargo movements.

CMOS automates and streamlines base-level cargo movement processes during peacetime and deployment cargo and passenger movements during contingencies. It provides an integrated transportation capability in routine, deployment, and sustainment operations by employing the same DOD- and Service-shipment policies and procedures in peace and war.

CMOS use is mandatory for all AF deployment and distribution cargo movement functions. The integrated deployment system (IDS) is used for wing-level deployment, contingency passenger, and cargo processing. (**NOTE:** GATES can be used in place of CMOS for deployment air manifesting at AMC strategic ports/on load locations).

CMOS produces both *cargo and passenger manifests*. Both Air Transportation personnel and the traffic management flight (TMF) use this system. Cargo manifest specify, in detail, the items or cargo carried for a specific destination. The passenger manifest simply lists the names of the passengers onboard. The passenger manifest, however, is used for deployments only.

206. Coordinate release of terminating cargo and mail

The airfreight activity at air terminals collect an official written document from all consignee activities that list the name, rank, and organization of individuals authorized to pickup general cargo. For classified cargo, signature service cargo, and registered mail, the security clearance of personnel authorized to pick up these items must be included on the authorization. Only US military and US civilians with the appropriate security clearance may sign for classified shipments and take custody of them. At overseas locations, each individual's date eligible for return from overseas (DEROS) must be included in the authorization as well. The official written document can be an appointment letter, a locally developed form, or a DD Form 577, Appointment/Termination Record–Authorized Signature. Unit mobility cargo may be turned over to the owning unit *without* an authorization letter.

These release authorizations are effective for two years from the date of issuance. The organization commander must authenticate release authorizations. Airfreight establishes procedures to ensure outdated authorizations are deleted each month.

Verify hand-carried letters requesting release of cargo/mail to individuals not identified in the official document by a return telephone call to the unit requesting the exception on a case-by-case basis.

The aerial mail terminal (AMT) identifies personnel who are authorized to receipt for registered mail on a local access list and/or DD Form 577. USPS is *not* required to furnish a list of employees who are authorized to receipt for mail of any category. All USPS employees are required to carry ID cards and, if not recognized, will be asked to present this identification.

If you are releasing cargo to anyone, you must obtain signatures from the people who are receiving it, whether they are required to be on the list or not. Use the TCMD, quick-release document, truck manifest, or other automated listing for a receipt on all cargo released. When using the TCMD, the receiving agent fills out blocks 28 and 29 and, if applicable, blocks 30 and 31. You must obtain a receipt from postal authorities or the AMT for mail shipments using a TCMD, cargo manifest, or other automated listing.

A signature from the TMO is not required when the air terminal and TMO are both under the operational control of AMC and located in the same facility. TMO is responsible for accounting for shipments moved and/or released to local consignees.

When receiving agents arrive at the air terminal, you (aerial port–cargo processing personnel) are responsible for loading cargo/mail on their vehicles for onward movement to final destination. If you are assigned to a work center that accomplishes blocking and bracing (securing cargo on the vehicle), your work center is responsible for establishing guidance and training to cover these procedures.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

201. Originating cargo roles and responsibilities

1. What is a shipper?
2. What steps, in order, does a shipper take to make a shipment?
3. Who helps the shipper prepare and correct shipping documents?
4. What three purposes does an ATCMD serve?
5. After obtaining clearance from the ACA, how does the shipper pack and prepare the shipment for movement?
6. What is a receiver?
7. What are the three activities the receiver is responsible for once a shipment reaches its final destination?
8. What is a transshipper?
9. What does a CCP do?
10. Which agency provides a critical link between the shipper, receiver, and transshippers?
11. In what ways does the ACA control cargo movement?

12. What does the CSB do?

13. Match each agency in column B with its function in column A. Items in column B can be used once, more than once, or not at all. Some items in column A will have more than one correct answer.

<i>Column A</i>	<i>Column B</i>
____ (1) Clears shipments that arrive at the air terminal without advanced ACA clearance.	a. Shipper.
____ (2) Challenges shipments.	b. ACA.
____ (3) Receives, processes, and forwards cargo.	c. CCP.
____ (4) Initiates TCMD.	d. Transshipper.
____ (5) Consolidates shipments.	e. CSB.
____ (6) Provides ACA with capability information.	f. Receiver.
____ (7) Controls cargo entering DTS.	
____ (8) Forwards shipment to transshipment point once cleared.	

202. Manually fill out a Transportation Control and Movement Document

1. For what is the TCMD used?
2. What two types of data are entered on the TCMD, and what are they?
3. In the DTR, where can you find information to complete a TCMD, block-by-block?
4. Where can you find a list of APCs used to identify POEs and PODs?
5. In general TCN construction, what do the first six digits represent?
6. In a mobility (unit move) TCN, what indicates that shipment is a unit move TCN?
7. Which RDDs indicate that expedited handling is required?
8. Which transportation priority moves as a last priority, only if there is room on the aircraft?

9. How is a date-shipped code constructed?

10. For what are TACs used?

203. Inspect and receive cargo

1. What do you look for when inspecting a shipment?

2. Which publication provides shippers detailed guidance on how to properly mark and label their cargo?

3. What are the three types of marking and labels, and what do they “tell” you?

4. If a shipment arrives at your location with a manual MSL and you have bar-code MSL capability, what are you required to do?

5. Generally speaking, a piece of cargo over how many cubic feet should have more than one MSL attached?

6. What are the procedures for receiving a damaged piece of cargo from an intermediate carrier?

7. When should you correct cargo discrepancies?

8. What is frustrated cargo and mail?

9. What form do you use to frustrate cargo?

10. How many copies of the AMC Form 33 are prepared? How are they distributed?

11. Once the shipment is corrected, what happens to the original AMC Form 33?

204. Performing receipt and in-checking cargo

1. What does the GMT hour code and last two digits of the Julian date represent?
2. How do you receipt for cargo and mail manually?
3. Within how many hours *must* cargo be processed?
4. Which documents *must* you prepare and/or make appropriate changes to when you split a shipment?

205. Processing in-transit, landbridge, and terminating cargo and mail

1. What is landbridge cargo?
2. How may landbridge cargo move?
3. At manual stations or when a manual manifest is used, what will the ATOC representative record on the inbound manifests when he or she delivers them to the cargo processing function?
4. For any cargo that requires immediate action, what do you have to do if the ATOC representative is unable to acquire the inbound manifests right away?
5. If, *after* six hours, the inbound manifests have *not* been received for routine cargo, what do you have to do?
6. What form is used to log all terminating manifests?
7. Once the cargo is downloaded from the aircraft and physically available to you, what *must* you do?

8. Match each type of shipment discrepancy/irregularity in column B with its description in column A. Items in column B can be used once, more than once, or not at all.

Column A	Column B
____ (1) A shipment that arrives at a terminal with cases broken open or mail sacks torn or cut.	a. Under shipment.
____ (2) A shipment that is removed from the terminal due to pilferage, spoilage, or suspicion of containing illegal items.	b. Short shipment.
____ (3) Is identified by adding the shipment information to the appropriate manifest on the last page below the cargo totals, writing "O/S" in the right-hand margin, and changing the totals on the manifest.	c. Overshipment.
____ (4) A shipment that is not listed on the manifest but actually arrived at the terminal.	d. Pilfered shipment.
____ (5) Is identified by circling the line item on the manifest, writing "S/S" in the right-hand margin, and changing the totals on the manifest.	e. Confiscated shipment.
____ (6) A shipment that is listed on the manifest but didn't actually arrive at the terminal.	f. Lost shipment.
____ (7) If no manifest accompanies the shipment, identify this type of shipment by preparing an inbound substitute manifest, annotating the GMT hour and date code and the words indicating the type of shipment and totaling the shipment.	
____ (8) Shipment is still unaccounted for 30 calendar days after initial discrepancy.	

9. List the steps to in-check loose in-transit cargo and mail.
10. For loose terminating cargo and mail, the GMT hour code and last two digits of the Julian date represent what?
11. List the steps for processing in-transit pallets destined for a single location.
12. When processing a terminating or mixed-destination in-transit pallet, before processing the cargo, what steps must you perform *first*?

206. Coordinate release of terminating cargo and mail

1. What must the airfreight activity collect from consignees authorized to pick up general cargo, and what information must be listed on it?
2. In which two instances do consignees *not* have to have an authorization letter?

3. How long are the authorizations in effect?
4. When is a signature *NOT* required for releasing cargo?
5. Who is responsible for loading cargo when consignees arrive to pick up their cargo?

1-2. Palletized Cargo

You have learned all about processing cargo into, through, and out of the DTS. In this section, we discuss what happens after accepting and processing originating cargo—building pallets and processing the cargo further for movement. We will start by talking about caring for the pallets, nets, and other tie-down you use to ship cargo. Then we will talk about inspecting those items, building single pallets and multi-pallet trains, and calculating the C/B for cargo. Finally, we will go over procedures for creating a RFID tag for palletized cargo.

207. How to maintain and care for 463L assets

Operational 463L pallets and nets are an integral part of DTS. During normal, day-to-day operations, these assets allow for load preplanning, reducing aircraft ground time, and maximizing available airlift. You will find detailed instructions concerning handling, inspection, maintenance, care, storage, and management of 463L pallets and associated net sets in the following:

- Technical orders (TO) 36M-1-141, *Operator and Operation Instruction—Materials Handling Equipment System Components of 463L*.
- TO 35D33-2-2-2, *463L Air Cargo Pallets, Types HCU-6/E and HCU-12/E*.
- TO 35D33-2-3-1, *Air Cargo Pallet Nets, HCU-7/E, I, Side, HCU-15/C, II, Top, HCU-11/C, Side, HCU-16/C, IV, Top*.
- DOD 4500.9R Part VI, *Management and Control of Intermodal Containers and System 463L Equipment*.

The entire DOD airlift system is built around the 463L air cargo handling system and its unique components, including materials handling equipment (MHE), air cargo pallets and nets, and the aircraft air cargo restraint system.

Failure or weakness in any one of these critical components can cause disruptions in the flow of cargo to its destination. 463L system air cargo pallets and nets are especially significant in that their availability allows for pre-palletization of cargo and advance load planning and prioritization. This advanced planning ensures available airlift capacity is used fully. It also contributes to efficient flight line cargo-loading operations that expedite critical aircraft turnaround. Imagine if they did not exist. How would you get each piece of cargo on the aircraft—by hand? How long would that take? How do you think that would affect operations?

The efficient operation of the 463L air cargo handling system is especially important during contingencies when large volumes of cargo must be moved on an international scale over a short period of time. Any shortage of pallets and nets during large contingency operations could totally disrupt the scheduled airlift flow of cargo and ultimately impact the outcome of the operation.

Maintaining pallets and nets

The 463L air cargo pallet, type HCU-6E, is the pallet used within the AMC airlift system. The primary purpose of the 463L pallet is to transport cargo in aircraft and within airfreight terminals. The pallet consists of an end-grain balsa-wood core sandwiched between two aluminum-face skins and framed on all sides with extruded aluminum-edge rails. There are twenty-two steel tie-down rings around the perimeter of the pallet to allow for nets and to aid in handling. Each of these rings can *safely restrain up to 7,500 lbs. in any direction*. The 463L pallet's dimensions, including the outer rails are 108" L (length) × 88" W (width) × 2.25" H (height), but the usable surface (what you can put cargo on) is 104" L × 84" W. Combined with the appropriate net set, the 463L pallet can safely hold 10,000 lbs. of cargo. A 463L pallet can actually hold up to 250 pounds per square inch (psi) (or higher with shoring), but when cargo is in that range, nets may not be used for tie-down and other factors, such as roller and floor loads, become the limiting factors. An empty 463L pallet weighs approximately 290 lbs.

Usage

Strictly prohibit the use of 463L pallets for purposes other than pre-palletizing and transporting cargo. Figure 1-12 shows a pallet being used as a cover or roof for some type of bunker. This is the wrong way to use a pallet. Contingencies do not change this fundamental policy. It is your job to ensure that units are not misusing these assets. Misuses include usage as building materials and intra-theater surface transportation beyond initial delivery of air cargo. Unless properly authorized, most users are not allowed to store pallets long term (more than three days). This three-day rule does not apply to air terminals or aerial ports. We need a certain amount available to do our jobs, which is why no one is allowed to misuse them in any way.



Figure 1-12. The wrong way to use a 463L pallet.

Pallets and nets fit so closely within the aircraft's cargo restraint system with extremely close dimensions. Using pallets and nets for other than their intended purpose can easily damage them. For that reason, units will not palletize cargo for movement by surface modes of transportation, except during inspections/exercises or for special programs.

Handling

The proper and preferred method of handling loaded 463L pallets is with a forklift that has tines measuring a minimum of 72 inches in length. Eight-inch wide tines are preferred and should be used whenever possible. Picking up pallets suspended from the corners with a crane or other similar methods is unauthorized for routine pallet movement.

When handling pallets with a forklift, use maximum forklift tine spread for the pallet size being handled. Ensure the heavy side of the pallet is toward the forklift mast and the pallet is level when rolling on or off. There will be exceptions dependent on size, shape, and type of cargo. Three-inch dunnage does not provide adequate clearance for rollerized tines. Raise the pallet high enough to accept the tines of the forklift being used. Do not lift or raise the 463L pallets by engaging the forklift tines to the rail lip or corner of the pallet and do not push, pull, or slide them (empty or loaded) over ground surfaces. You must use extreme caution while handling pallets on bare fork tines. Serious damage to aircraft and/or pallets can occur.

463L pallets are normally moved by forklift or other mechanized means; however, real-world situations sometimes dictate manually moving these pallets. The pallets can be moved over short distances by hand using a minimum of six people (equally positioned) and four lifting tools specifically described in the TO. The lifting tools intend to provide a safe means of manually stacking, unstacking, or positioning the pallets on dunnage. Do not lift the pallet above waist high and use safe lifting procedures while manually handling pallets.

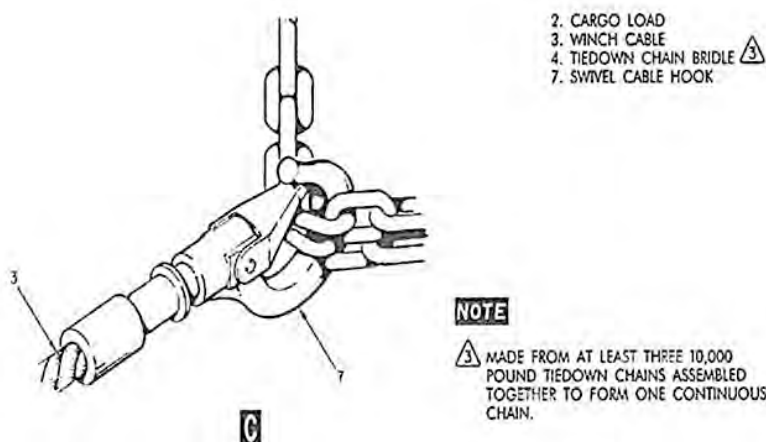
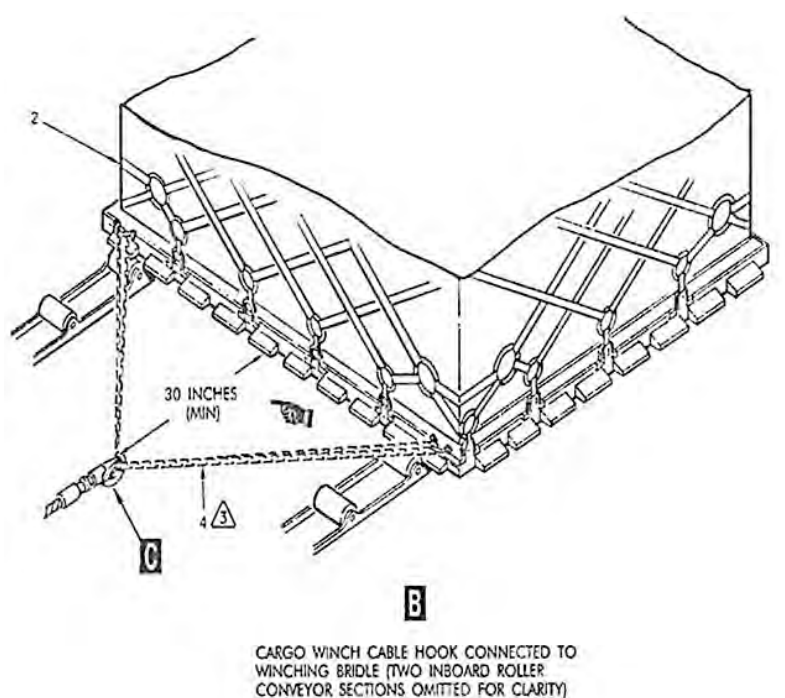


Figure 1-13. Proper way to winch a pallet.

Always place loaded pallets upon roller conveyors, palletized cargo trailers, slave pallets, or suitable dunnage. Provide three rows of dunnage support to each loaded pallet, one row under the centerline and one row along each side (88-inch dimension) of the pallet. Ensure dunnage is uniform in height, smooth and free of protrusions, and/or sharp corners. The preferred types of support and acceptable types of dunnage *in descending order* are as follows:

1. Three rows of warehouse-type conveyors on hard-surface material or palletized trailers.
2. Wooden dunnage with a uniform thickness of at least 3 inches thick (88 inches long *minimum*) arranged to form three rows of support.
3. Approximately 15 sand bags are required for best support; however, a *minimum* of nine sand bags is acceptable. Arrange sand bags to provide two outer and one centerline of support.

Transport pallets on flatbed trucks and trailers only when they are supported by the required dunnage. Use 463L nets to secure the load to the pallet and secure both the pallet and the load to the truck/trailer using chains or straps.

If you must winch a pallet into or out of an aircraft, use at least two attaching points for the chain or cable, preferably tie-down rings at each corner of the pallet. Failure to use this method could result in irreparable damage to the pallet rail. *Under no condition should you use a single point of pull.* Refer to figure 1-13 for the proper way to winch a pallet on an aircraft.

Cleaning

Clean pallets/assets leaving an overseas location to meet US Department of Agriculture (USDA) and DTR, Parts III and V requirements. The DTR, Part V also lists the Armed Forces Pest Management Board website for you to reference specific instructions for washing and cleaning cargo for return to the United States.

Destructive pests, such as gypsy moths, brown tree snakes, several varieties of snails, and other species, can hitchhike on military equipment and personal effects. Foreign soil attached to cargo can harbor pests and animal diseases. These pests can cause immense damage to America's natural resources, destroy crops, and disrupt the export of agricultural commodities. DOD's policy is that all organizations and personnel involved in the movement of DOD-sponsored cargo, personal property, and accompanied baggage will take steps necessary to prevent the spread of agricultural pests. This includes movement not only across national borders but any movement that has the potential to introduce invasive species to a new area. It includes shipments from DOD installations and vendor locations by both military and commercial carriers.

All personnel involved in the movement of aircraft, personnel, cargo, containers, packing material, privately owned vehicles (POV), personal property, and mail will assure the following requirements are satisfied prior to that movement:

- Do not load cargo on any conveyance in a foreign country for movement to the United States, unless it is free of animal and plant contamination or pest infestations.
- Do not store cargo containers/pallets directly on bare ground.
- Ensure all wood packing material (WPM), dunnage, pallets, and crating are soil and bark free and free of pest infestations.

Pallets of cargo arriving at a terminal with soil and foreign insect pests disrupt airlift, cause delays, and affect the overall readiness of the DTS because they must be cleaned before they can be transported further. In addition, dirty pallets of cargo can contaminate the aircraft, which causes even more problems. All air transportation personnel everywhere are responsible for ensuring pallets of cargo are properly cleaned for transportation and protecting those pallets against foreign contaminants while in the pipeline.

While defining clean can be subjective to some, the USDA inspection standards *only* allow a thin film of road dust on equipment normally accumulated during transportation holding, storage, and transit.

Generally, dirt, sand, or mud that can be collected by pinching with fingers would not qualify to meet USDA standards.

Storing

Do not stack empty pallets upside down. This could cause pallet tie-down rings to swing under the pallet and damage the surface of the pallet beneath. Empty pallets may be stacked 50 high for storage provided adequate dunnage is used between each stack of 10 pallets, and all rings are in the lowered position. Dunnage must support each stack of 10 pallets along each side and through the center of the stacks. All three rows of dunnage must be at least three inches thick or more and a minimum of 88 inches long and placed across the short dimension of the pallets. None of the pallets will hang over the ends of the dunnage.

When pallets are stored outside, place a plastic barrier between wooden dunnage and the aluminum surface of the pallet for each stack of 10 to prevent corrosion, to include the bottom row of dunnage. Slope stored pallets of this type to allow moisture to drain by placing elevating material (scrap, lumber, etc.) of the same size under one end of the dunnage: not between the dunnage and pallet. Plastic dunnage does not require additional plastic barriers. Pallets, stored outside for short periods of time and used in the process of transporting cargo, do not require moisture barriers. Figure 1-14 illustrates how pallets are stacked and covered in long-term outdoor storage. A good example of a short-period pallet storage is a "pallet stacker." A pallet stacker can hold up to 20 pallets with dunnage in between every 10 without a plastic barrier.

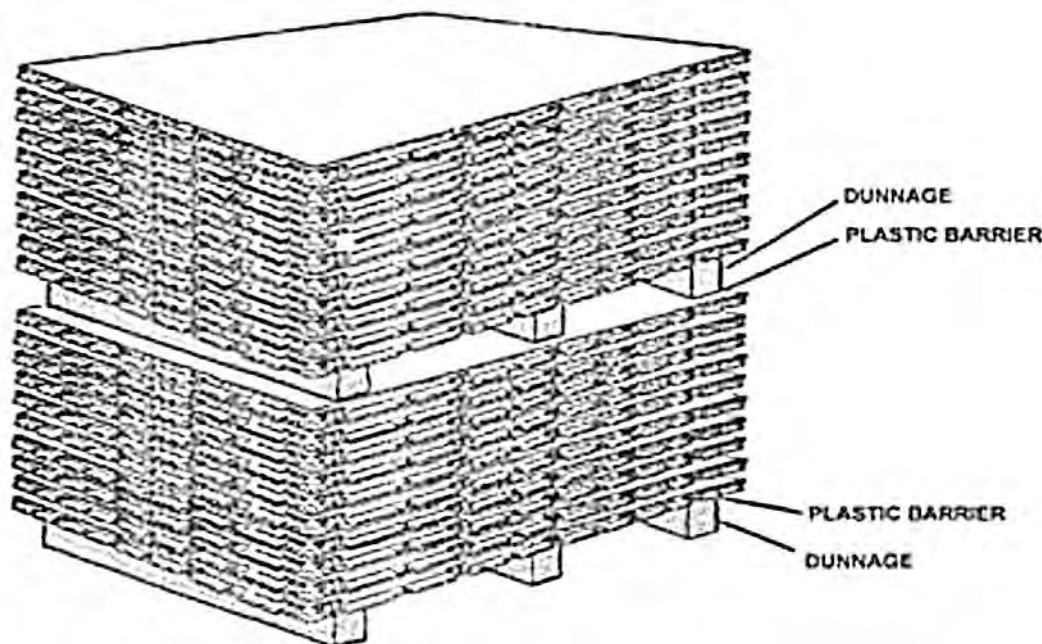


Figure 1-14. Outdoor long-term pallet storage.

Mobility/contingency storage

Restrain palletized loads placed in mobility/contingency storage with 463L nets, straps, or chains. Forklift operators must make sure cargo load is properly secured to the pallet (nets, straps, or chains) prior to movement of the pallet.

Inspect pallets used in this type of storage twice a year. This inspection consists of a simple visual inspection of the pre-pallet. Any pallets that show signs of damage are unloaded and inspected further.

War readiness materiel pallets

Inspect war readiness materiel (WRM) pallets on a staggered schedule annually. For example, inspect one-half each six-month period. Inspect a *minimum* of 10 percent of each 40-pallet group, including one pallet from each series of 10 pallets.

Inspecting

Inspect all pallets for signs of corrosion, warpage, delamination, damaged rails, and loose or missing hardware. If you find any damage, remove these pallets from the airlift system for repair. This is a matter of flight safety since cargo restraint requirements would be affected.

Rings that are cracked, pitted from corrosion, or deformed to the point that connecting a net hook is difficult or impossible are considered unserviceable. Surface corrosion does not render a pallet ring unserviceable. Pallets with missing or broken rails or with damaged locking lips will be *condemned*.

Do not load pallets showing any evidence of skin separation under any circumstances. There is no need to repair dents, gouges, and scratches that do not fracture the face skin. The pallet is capable of sustaining many small local dents without loss of structural strength. More extensive damage must be repaired immediately, since delay could result in further, possibly irreparable, damage. Check suspected delamination by tapping the area with a coin or small hammer. You will hear a sharp sound if the area is good as opposed to a dull or clicking sound if delamination has occurred.

Warped pallets run the risk of *not* fitting into the aircraft rail system. They could become stuck or damage the rail system and cause delays. Always check pallets for flatness before placing cargo on them.

Protect pallets requiring repair from further damage through handling or environmental conditions. It is imperative that damage receive prompt identification and repair to prevent costly depot repair or condemnation of the pallet.

Repairing

Organizations must return pallets to serviceable condition as expeditiously as possible, whether the repairs are local or depot level. Some pallets are not reparable and are considered condemned. At the local level, you can repair many types of damage to pallets. However, depot-reparable pallets must be shipped to an authorized repair facility. Do not allow depot-reparable pallets to accumulate at installations. Do not dispose of condemned pallets at the unit level unless directed by the major command (MAJCOM) or DOD pallet and net monitor. When practical, users can even turn in reparable pallets to the closest AMC APOE for a one-for-one exchange.

Ship condemned or depot-reparable pallets with the proper condition tags. Identify them with the DD Form 1577, Unserviceable (Condemned) Tag–Materiel, or DD Form 1577–2, Unserviceable (Reparable) Tag–Materiel. Ship nets off installation to a repair facility if the quantity exceeds the capability of the local maintenance fabrication shop or equivalent. The depot repair facility will handle all repairs not within the maintenance capability of the installation or unit.

Shipping

Stack empty 463L pallets for airlift up to a *maximum* of 20 pallets, excluding the base-support pallet. Separate the first pallet from the base pallet by three rows of lumber (minimum of three inches thick and four inches wide, commercial grade) placed equal distances apart or by placing four wooden warehouse skids of equal thickness to cover the entire surface of the base pallet.

Use additional separation as required to facilitate pallet buildup or forklift operations. Normally, secure pallet stacks with side and top nets. Side nets and straps may be used for stacks of 6–20 pallets as long as seven straps are used, four longitudinally and three laterally. After restraining empty pallets, you may place additional cargo on top and secure separately. The only exception is that nets for the empty pallets may be placed under the top net/straps used to secure the empty pallets. Cinch up side nets as tightly as possible to prevent snagging on the restraint rails in the aircraft. The nets as

described will be the only required restraint for stacks of empty pallets. When using sides and straps for less than 20 pallets, ensure ratchets are placed on the top of the pallet.

Transport empty pallets in stacks of five or less, plus the base pallet, with only chains and devices or cargo straps for restraint. When this method is used, attach chains by threading them through two rings (one each corner of each pallet). An MB-1/CGU-4/E device is attached to the free end of each chain and hooked to a similar device leading from a diagonal corner. When the four required chains and devices have been secured, a figure “X” will have been formed across the top of the pallet.

Using and maintaining nets and other tie-downs

Since pallets, nets, and any tie-downs are part of a system, you cannot manage one properly without the other. Nets and other forms of tie-down are just as critical to successful DTS operations. Like pallets, nets and any tie-downs are not used for any other purpose than restraining cargo to pallets. Do not use them as hammers, prybars, or for constructing shelters. Likewise, they must be clean and free of pests, dirt, soil and sand.

Nets

Authorized restraints for use with the pallets are the 108 × 88-inch 463L nets (type HCU-7/E and HCU-15/C). These nets are designed to provide an 8-gravitational (G) dynamic forward restraint, 1.5 G upward restraint, and 3.2 G side restraint.

Two HCU-7/E side nets and one HCU-15/C top net make a net assembly for use with the 463L pallets. When securing material on pallet trains, use three HCU-7/E side nets and two HCU-15/C top nets for a two-pallet train. Use four HCU-7/E side nets and three HCU-15/C top nets for a three-pallet train.

Approximate cargo stack height is 96 inches. The maximum restrained cargo load will not exceed 10,000 lbs. The maximum restrained load on two- and three-pallet trains is 26,000 lbs. provided the height is 96 inches or less. Limit pallet trains measuring 96–100 inches to 21,000 lbs.

Cleaning

Small drops of oil or grease will not harm the nets. Remove large spots of soil, however, by washing with mild soap and tap water. Washing reduces webbing strength; therefore, only clean as much as necessary. If a net is subjected to salt water, rinse it in several changes of fresh water immediately. Steam heat or any cleaning method involving high temperatures is prohibited. During cleaning, keep nets away from heat sources, such as radiators and direct sunlight.

Do not load damp or wet pallets. Moisture can damage cargo and increase the possibility of the cargo shifting on the pallet. After the cleaning operation, air-dry the pallets in the shade, using no heat.

Storage

Direct sunlight and moisture will cause deterioration of nylon webbing, so do not leave loose nets outside without protective coverage for more than 72 hours.

WRM

Inspect nets stored as part of WRM stock once each year on a staggered inspection basis (i.e., one-half each six-month period. Inspect nets packed in containers by removal of 10 percent of the total, to include a portion of the bottom layer in each container). Conduct a visual inspection for wet and/or corroded material and nets returned to the original container.

Temporary storage of nonoperational nets (not more than 90 days)

When nets are no longer in all operational status and will be returned to storage facilities, observe the following procedures:

- Remove any existing corrosion and use a preventative corrosion compound.

- Store in a cool, dry, covered space since heat, direct sunlight, and moisture cause deterioration.
- Do not store with or near acid, batteries, chemicals, or alkalines.
- Do not place nets in storage while wet.
- Pack nets in bins, racks, pallets, or suitable boxes lined with water-vapor proof barrier material or a polyethylene cargo-pallet bag.

Inspection

Rust is not necessarily a condition requiring replacement. However, if the sliding or moving parts cannot be manually freed but continue to bind, replace the hardware. Do not use lubricant to assist in freeing the binding part. Also, replace hardware that is twisted or bent out of shape. Conduct a visual inspection of welding cracks in the rings.

Aerial port personnel can replace some damaged hardware on a net. Many terminals and facilities already have damaged nets that can be “cannibalized” (taking the good parts of the damaged net and using them to replace damaged parts of other nets). Before you start cannibalizing nets, ensure your facility has procedures for that and you are using the right nets.

Shipment

Use the following procedures to transport nets when they are *not* being used to secure cargo:

- Dry nets thoroughly before shipping.
- Pack nets well in boxes lined with a water-vapor proof barrier material.
- Label each box with the type and quantity of nets contained and tag with a DD Form 1577 or 1577-2.

CGU-1/B straps

These versatile straps can restrain up to 5,000 lbs. and come with a fixed hook on one end and an adjustable hook on the other. TO 13C2-1-1 contains instructions for cleaning CGU-1/B straps.

Some CGU-1/B straps have cotter pins that can work themselves loose, so you must make sure you inspect the cotter pins before using the straps. According to the TO, you are permitted to adjust the cotter pins by bending the open end of the cotter pins back to prevent them from working themselves loose.

Examine the fixed and adjustable hooks for serviceability. Inspect the adjusting mechanism for deformities, cotter pins fully inserted and ends bent back, cracked or deeply scored parts. Ensure the ratcheting handle opens and closes without binding and the positive-type lock engages upon completion of the tightening operation. If binding does occur, you can lubricate (see the TO for acceptable lubricants) the device. The strap cannot be frayed or excessively worn. Inspect tightening device for things like misassembled parts, bent fingers on parts that rotate the spindle, or springs that do *not* properly engage fingers. Reject any straps with these faulty parts. If the fixed hook is still serviceable, salvage it and send it back into supply for reuse. Figure 1-15 illustrates how to use a CGU-1/B cargo strap.

Chains and devices

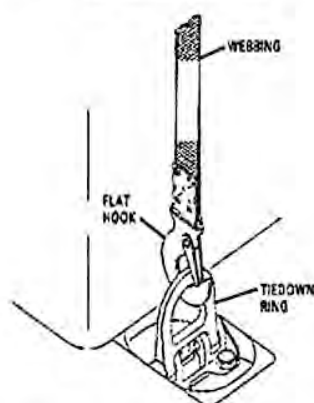
Although there are five different types of chains in the AF inventory, the MB-1 (10,000 lbs.) and MB-2 (25,000 lbs.) chains are the primary chains you will see in the field. Visually inspect chains prior to each use. Inspect for cracks, damage or deformity of links, excessive wear, and corrosion.

There are four different device types currently in use today. The MB-1 and CGU-4/E (10,000 lbs.) and the MB-2 and CGU-3/E (25,000 lbs.) are what you will see and use in the field. All devices consist of an adjustable hook, tension grip, chain lock, quick-release lever, and chain pocket (fig. 1-16).

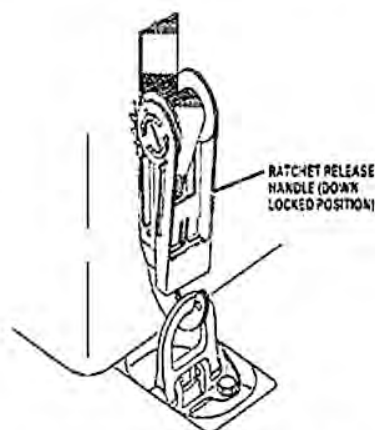
INSTALLATION OF TIEDOWN DEVICES

STEP 1 PLACE TIEDOWN DEVICES
ACROSS CARGO

STEP 2 HOOK FLAT HOOK ON ONE END OF DEVICE ONTO
TIEDOWN RING IN CARGO FLOOR

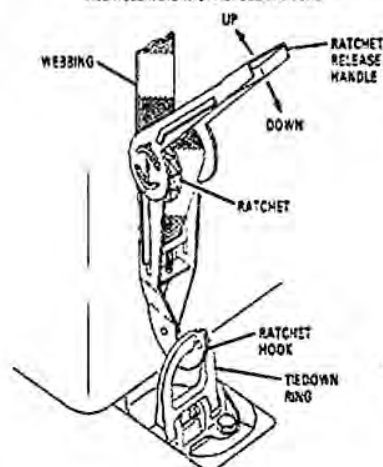


STEP 5 LOCK THE DEVICE BY PLACING RATCHET RELEASE
HANDLE IN THE DOWN AND LOCKED POSITION



STEP 3 HOOK RATCHET HOOK ON THE OPPOSITE END OF
THE DEVICE ONTO THE TIEDOWN RING IN THE
CARGO FLOOR

STEP 4 HOLD RATCHET RELEASE HANDLE FIRMLY AND
WORK IN AN UP AND DOWN MOTION UNTIL THE DE-
VICE WEBBING IS TAUT ACROSS THE LOAD



TIEDOWN DEVICE REMOVAL AND RELEASE

STEP 6 HOLD RATCHET RELEASE HANDLE FIRMLY AND
MOVE UP TO RELEASE DEVICE FROM LOAD, THEN
UNHOOK RATCHET HOOK AND FLAT HOOK FROM
TIEDOWN RING IN FLOOR

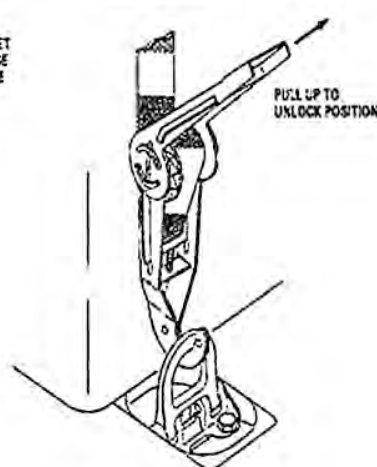
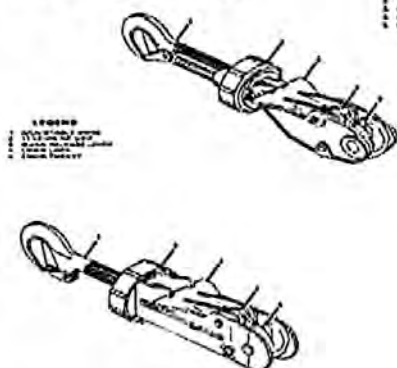
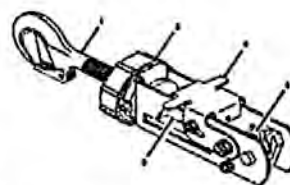


Figure 1-15. CGU-1/B installation.

MB-2 devices



LEGEND
1. RATCHET RELEASE HANDLE
2. TIEDOWN RING
3. RATCHET RELEASE LEVER
4. CHAIN LOCK
5. CHAIN HOOK



MB-1 devices

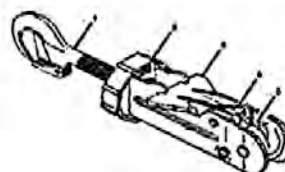


Figure 1-16. MB-1 and MB-2 parts illustration.

Visually inspect all types of devices prior to each use. Inspect for cracks, corrosion, or bent or worn parts, which impair the intended function of the device. Clean and lightly lubricate moveable parts and any corroded areas that may cause binding or sticking.

To function-check the device, with the adjuster in the locked position, attempt to install a chain link that will be used to secure the load in flight. If you can install the chain in this locked position, the device is unserviceable and will be condemned.

If you cannot install the chain link with the adjuster in the locked position, unlock the adjuster, install the chain, and lock the adjuster again. Try to release the chain by pulling the chain in all directions forcefully. If the chain does not release, it is OK to use following the procedures illustrated in figure 1-17.

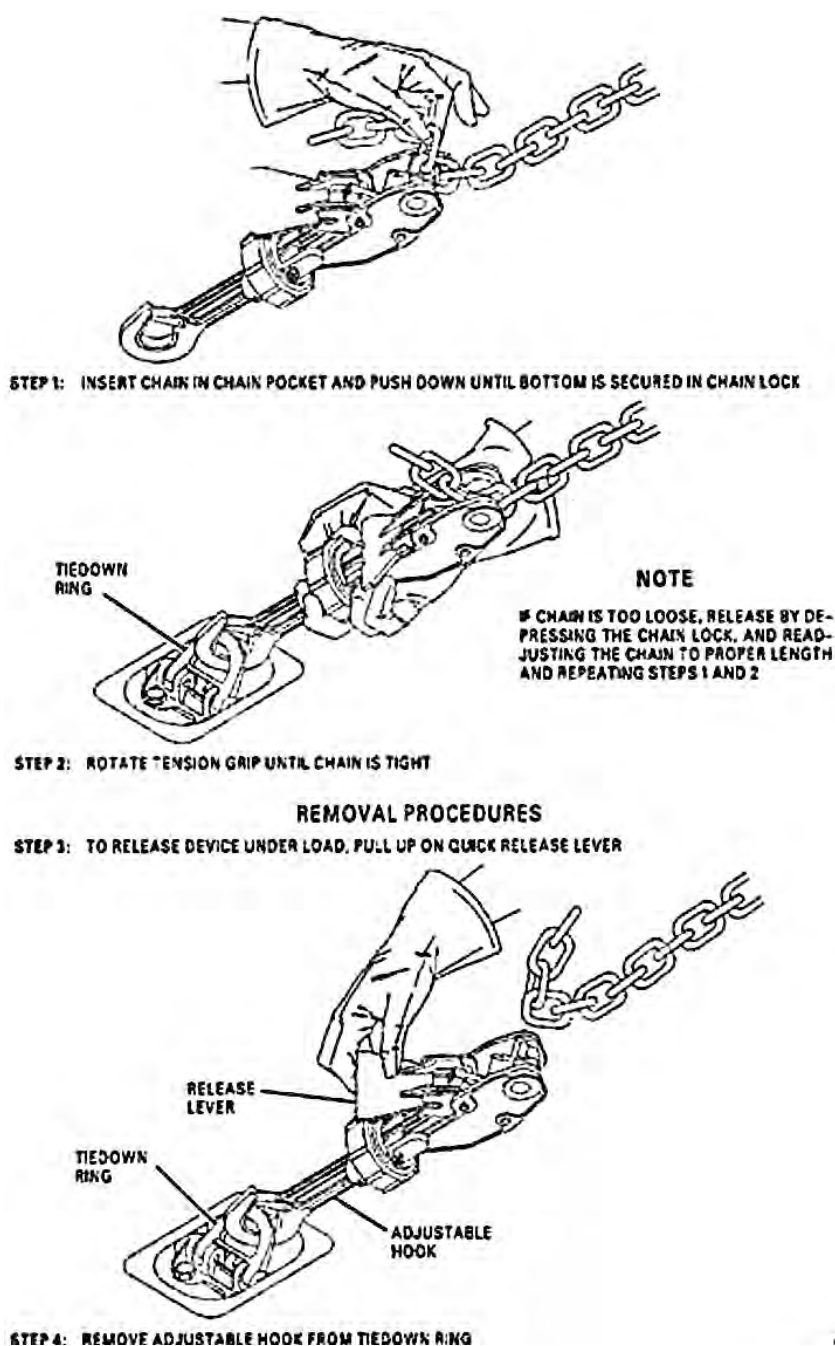


Figure 1-17. MB-1 and MB-2 chain and device installation.

Couplers

Couplers come in two different forms: one inch and two inch. One-inch couplers (commonly referred to as KC-10 couplers) are used for multi-pallet trains that are airlifted on KC-10, DC-10, B-747, and other commercial aircraft. Two-inch couplers (commonly called standard couplers) are used for multi-pallet trains that are airlifted on C-5, C-17, and C-130 aircraft. The couplers literally space the pallets apart by one or two inches so the pallets fit properly on the aircraft. It is important to know which type of aircraft your cargo will be moving on before building any multi-pallet trains. Failure to do so could result in breaking down and rebuilding those trains. Figure 1-18 illustrates the differences between the two couplers.

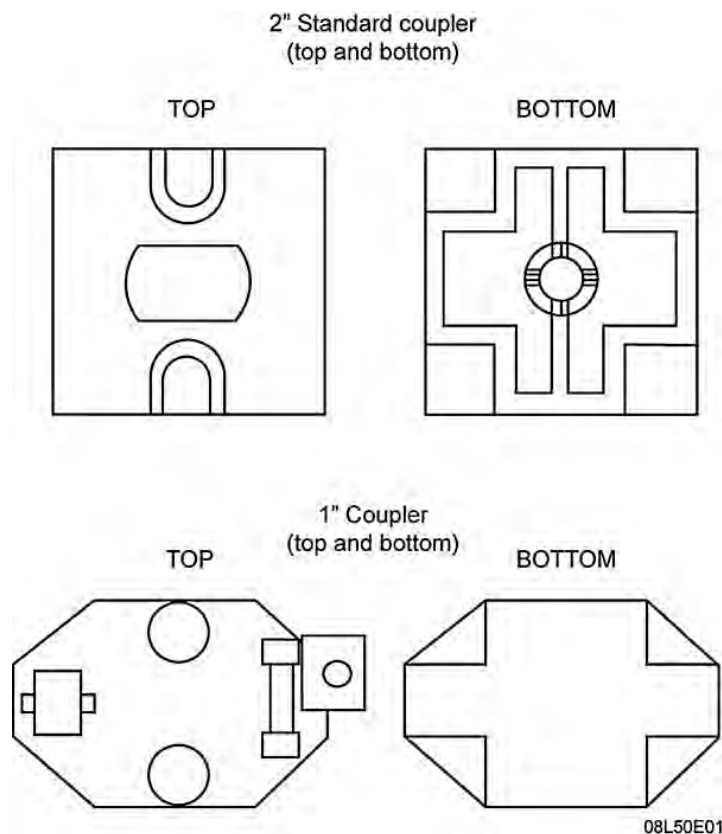


Figure 1-18. One-inch and two-inch couplers.

Recovery of pallets and nets

Consignees must remove cargo from pallets immediately upon receipt and return the pallets and nets (cleaned and stacked IAW the applicable TOs) to the nearest airlift site as soon as possible. Organizations must also remove cargo from pallets if that cargo is diverted for movement between locations via a surface mode of transportation. Cargo may remain palletized if being moved over the road to another location for eventual airlift or delivery to the ultimate consignee. The recovery of 463L pallets and nets is a priority task in contingency operations. Many times, the recovery process needs the help of contingency assets recovery teams (CART). The CART is a deployable unit that recovers pallets and nets from exercise, humanitarian, and contingency operations. The CART is responsible for identifying 463L assets, evaluating serviceability, arranging transportation for the pallets, and other related assets such as specialized shoring kits to an aerial port for reinsertion in the airlift system. The CART will not disassemble shelters, bunkers, or other facilities created out of pallets and other assets but can direct others to do so. Airlift or truck assets will transport serviceable or repairable pallets to an aerial port.

Managing pallets and nets

Each AMC unit appoints a pallet/net and tie-down equipment manager IAW the DTR. The unit pallet/net and tie-down equipment manager is responsible for accounting for, issuing, and controlling pallets, nets, tie-down chains, straps, devices, pallet couplers, RFID tags, and nuclear shoring kits, some of which are listed in the following table.

AIR FORCE MANAGED 463L EQUIPMENT		
Nomenclature	NSN	Size/Capacity
Pallet, Cargo, Aircraft, HCU-6/E	1670-00-820-4896CT	88 X 108 X 2.25 in ¹ 10,000 lb. capacity
Net, Cargo, Tie-down Pallet, Top, HCU-15/C	1670-00-969-4103CT	88 X 108 in ¹ 10,000 lb. capacity
Net, Cargo, Tie-down Pallet, Side HCU-7/E (two pieces per top net)	1670-00-996-2780CT	88 X 108 in ¹ 10,000 lb. capacity
Coupler, Pallet, C-141/C-130/C-5	1670-01-061-0990CT	2 in ¹
Coupler, Pallet, KC-10/DC-10	1670-01-487-8743CT	1 in ¹
ITEMS MANAGED BY DLA AND UNIT FUNDED		
Nomenclature	NSN	Size/Capacity
Strap, Nylon, Tie-down, CGU-1/B	1670-00-725-1437	5,000 lb. capacity ²
Cover, Cargo, Pallet	3990-00-930-1480	Unit of issue roll (10 count) ²
Strap, Webbing, Tie-down	5340-00-980-9277	5,000 lb. capacity ³
Chain, Tie-down, MB-1	4010-00-516-8405	10,000 lb. capacity ³
Adjuster, Chain, MB-1	1670-00-212-1149	10,000 lb. capacity ²
Chain, Tie-down, MB-2	1670-00-778-4079	25,000 lb. capacity ²
Adjuster, Chain, MB-2	1670-00-212-1150	25,000 lb. capacity ²

Regardless of whether the Air Force or DLA manages the equipment, the pallet/net manager must account for and manage these items. In detail, the pallet/net manager does the following:

1. Controls, maintains, and reports pallets and nets IAW AMCI 24-101 V13, its supplements, and referenced TOs.
2. Conducts inspections to ensure proper use and storage of pallets and nets, controls and accounts for WRM pallets and nets, as required by the applicable TOs.
3. Conducts a physical inventory of operational pallets and nets as required by the MAJCOM pallet and net monitor.
4. Revalidates pallet and net requirements at least annually and document that they are the minimum required to accomplish the mission.
5. Provides a clear audit trail for pallet and net losses or gains.
6. Units not possessing WRM pallets and nets coordinate with the MAJCOM pallet and net monitor to obtain pallets and nets for unprojected deployments, special assignment airlift missions (SAAM), and exercises.
7. Adheres to shipping instructions prescribed in referenced TOs when preparing to ship assets.
8. Ensures that unit personnel are aware that WRM pallet and net assets must be returned to the airlift system immediately upon arrival at the final deployed destination. Requires a one-for-one exchange for all pallets and nets when practical. Notes all exceptions to the one-for-one exchange policy in a control log or other audit trail formats.
9. Conducts investigations of unexplained pallet and net losses. Forwards results to the MAJCOM pallet and net monitor.

10. Scrutinizes over-the-road movement of pallets to reduce the possibility of damage.
11. Advises personnel of the potential for disciplinary action if pallets and nets are damaged or destroyed due to negligence.
12. In the event of a conflict or contingency, be prepared to ship, on short notice, large quantities of serviceable pallets and nets to other organizations at the direction of the MAJCOM pallet and net monitor.

The following table reiterates these duties in the form of a checklist and comes from the DTR. Everyone is responsible for ensuring the proper care of our valuable equipment in aerial ports and any other unit. All air transportation personnel must be the guardians for these critical assets.

Equipment Inspection Checklist			
	Yes	No	N/A
1. Are WRM pallets inspected for signs of corrosion, damage, or missing hardware?	---	---	---
2. Are pallets stacked on three-point dunnage of uniform material and thickness?	---	---	---
3. Are pallets stacked no more than 50 pallets high with three-point dunnage placed between every 10 pallets?	---	---	---
4. In outside storage areas, is a plastic barrier used to separate dunnage from the bottom pallet in a stack and is adequate sloping dunnage provided to allow for moisture drainage? Are biodegradable plastic covers replaced when no longer serviceable and/or functional?	---	---	---
5. Are reparable pallets tagged to specify extent of damage?	---	---	---
6. Are nets and restraining devices loosely secured on all prepalletized loads in storage for mobility or contingency purposes?	---	---	---
7. Are nets properly stored in a cool, dry place, out of direct sunlight or moisture-causing conditions?	---	---	---
8. Are nets thoroughly dry when placed in storage?	---	---	---
9. Are operational and WRM nets stored in bins, racks, or suitable boxes lined with a vapor-proof barrier material?	---	---	---
10. Are nets in storage inspected at least annually?	---	---	---
11. Is a minimum of 10 percent of the total number of nets in each storage container inspected, to include a portion of the bottom layer?	---	---	---
12. Are operational and WRM nets in storage visibly labeled to reflect quantity and type?	---	---	---
13. Are reparable nets tagged to specify extent of repair?	---	---	---

Tie-down equipment checklist

Another way the Air Force ensures accountability for its tie-down is by accounting for each piece of tie-down issued to and inventoried on a home-station aircraft. The home station tie-down representative prepares AF Form 4069, Tie-down Equipment Checklist, or an AF Form 1297, Temporary Issue Receipt, for tie-down equipment issued to each home-station aircraft.

Home-station actions

Before aircraft departure from home station, the tie-down crew representative initiates an AF Form 4069, then inventories and issues all tie-down equipment to comply with the appropriate aircraft configuration or mission directives. The representative places the original copy, which accompanies the aircraft, in a protective folder to increase visibility of the AF Form 4069 and reduce the possibility of the forms being disposed of as trash. Stencil “AF Form 4069” in bold print on both sides of the folder for increased visibility. The tie-down crew representative will ensure sufficient copies are prepared for each en route station. AF Form 4069s are not required for training missions scheduled to depart from and return to home station without an interim stop.

The loadmaster/boom operator inventories the tie-down equipment and ensures the quantities on hand are sufficient for the mission. The unit pallet and net manager maintains a signed copy of this form.

The tie-down representative performs a one-for-one exchange of tie-down equipment for channel airlift missions. For contingency/SAAM-type missions, the deploying units must provide the tie-down equipment for restraint of their pallets. If a one-for-one exchange is not possible, annotate the AF Form 4069, Part III, with the amount of tie-down equipment issued and the reason. The tie-down representative maintains a copy of this form in station files.

Treat AMC aircraft temporarily based at an en route station like home-station aircraft for the duration of their assignment. Maintain their tie-down inventory at the same level as when they first arrived. The Ramp Services tie-down monitor completes and maintains copies of the AF Form 4069.

AMC provides 463L pallets, chains, devices, and couplers when commercial aircraft are used to move rolling stock. Couplers will only be provided if needed to couple pallets together as a subfloor. The deploying unit will provide pallets, tie-down, and couplers for cargo not intended to be loaded as rolling stock.

Tie-down personnel are responsible for issuing tie-down equipment to other-than-AMC aircraft, using AF Form 1297. Prepare the AF Form 1297 in two copies. On the form, legibly print the name, organization, and location of the individual who signs for the tie-down equipment. Annotate the following statement on the AF Form 1297: “Tie-down equipment will be returned to issuing station within 30 days.” The flight crew keeps the original copy of the AF Form 1297 and the unit pallet and net manager for future reference maintain the duplicate copy.

Aerial ports issue pallets, nets, and tie-down equipment to other unit or activities using a custodial log for the time of issue and return. The log will look something like the following:

INSTALLATION: Andrews AFB, Maryland						
ACTIVITY: 89th Aerial Port Squadron						
CUSTODIAL LOG						
Julian Date	Asset Type	Gain/Loss	Reason/Manifest	If Other Than a Manifest (Name, Number Rank, Social Security Number [SSN], Duty Station, Duty Phone)	Signature	Remarks
9276	Pallet Set	-23	C17 Down Load Picked up 5, Manifest ABC.			Signature receipt on manifest.
9277	Pallet Set	-1	Picked up Palletized Cargo.	Jones, John, Capt USA, 123-45-6789 Phone: 555-8910 9265 day.	xxxxx	Will return pallet with shipment on Boondocks, Det 12.

INSTALLATION: Andrews AFB, Maryland						
ACTIVITY: 89th Aerial Port Squadron						
CUSTODIAL LOG						
Julian Date	Asset Type	Gain/Loss	Reason/Manifest	If Other Than a Manifest (Name, Number Rank, Social Security Number [SSN], Duty Station, Duty Phone)	Signature	Remarks
9277	Pallet	+1	Turned in by SSgt White, FMS, found on station.	Will hold to fill shortage and include in monthly report.		

En route stations

At en route stations, tie-down representatives annotate AF Form 4069 upon aircraft arrival/departure. In the absence of an AF Form 4069, the en route station generates one based on arrival tie-down inventory and annotates "Issued by XXX" (station code) at the top of the form. If there are no air transportation requirements at the aircraft, there is no requirement to annotate the AF Form 4069.

Return to home station

The tie-down representative meets all AMC transport aircraft upon arrival at home station and inventories tie-down equipment. He or she enters the amount of each type of tie-down equipment on the aircraft in the termination-check column of the AF Form 4069.

The tie-down representative performs an inventory and compares the station file copy of AF Form 4069 with the aircraft copy to determine missing/lost equipment and airfreight. He or she initiates a report of survey, if required. The loadmaster/boom operator makes a written statement, if required.

Inventory and reporting

Pallet and net managers inventory pallet, net, RFID tag, and tie-down equipment assets as required and submit a weekly inventory report to HQ AMC using the HQ AMC/A4TE (Wartime Aircraft Activity Report [WAAR]) 8001, AMC Key Asset and Equipment Report.

How much equipment a unit is authorized is determined by the historical workload or wartime requirements and is reflected on the 8001 report. HQ AMC/A4TE must approve waivers to decrease these established minimum levels. However, units may increase these levels, with A4TE concurrence, if consumption experience indicates they are inadequate.

208. Building single pallets

You have already received and processed cargo at your terminal and your next step is to build it onto pallets to make loading easier and faster. You have already inspected your pallet for serviceability according to the requirements in the last lesson. Now, let's go over how to assemble and build a pallet.

Selecting the cargo

As we already talked about, 463L pallets must be serviceable to use them for building cargo pallets. Prior to use, pallets must be thoroughly cleaned and inspected (top and bottom) for missing and cracked D-rings, warping, exposed core, and/or extreme delamination. Before stacking cargo or mail on pallets, ensure the pallet is fully supported and stable on rollers, pallet dolly, or appropriate three-point dunnage.

Palletize cargo or mail by destination, transportation priority, movement indicator, and SET within movement priority. The pallet SET will become the *earliest SET of the highest priority* of shipment on the pallet.

To the greatest extent possible, build each cargo or mail pallet for one destination. However, to complete a pallet (especially for low-volume channels), terminals may combine cargo or mail for different destinations to ensure timely movement and maximum pallet use, keeping in mind that the AMC goal is to avoid needless pallet breakdown and cargo rehandling at transshipment points. Build pallets to enhance maximum aircraft utilization; lighter pallets may be built when intended for transfer to aircraft with restricted pallet profiles (e.g., DC-8, KC-10, etc.).

These pallet build procedures do not apply to the “pure-pallet initiatives” for contingencies. To best support the warfighter, combatant commands may require pallets delivered to their areas of responsibility (AOR) to be “pure.” These pure pallets are shipped palletized beyond the APOD all the way to the end user. The pure-pallet program increases the effectiveness and velocity of shipments to the final end users by relieving the AOR of the burden of break-bulking pallets. A “pure pallet” is a pallet that contains only shipments destined to a single DODAAC or a supply support activity (SSA). Pure pallet initiatives are only effective in theaters with high volumes of cargo and an immature logistics infrastructure. They are especially suited for some contingencies but are not common practice in the DTS.

The expeditious movement and delivery of TP-1 shipments with movement indicators is dependent upon available airlift and priority processing. In order to maximize aircraft utilization and reduce processing times, single-priority pallets should be built to the maximum extent possible. Maximize efforts to move loose AMC MICAP and TP-1 shipments with movement indicators to the point that will avoid a delay on mission departure.

Separate cargo or mail on mixed-destination pallets to be offloaded at en route stops by destination, using plastic covers or a suitable substitute inserted between each destination. This permits rapid identification at en route stops.

Cargo processors strive to obtain at least 90 percent of a pallet’s maximum weight and/or 80 percent of its cube. Pallet weight/cube goals apply to general cargo within the channel airlift system, but if cleared and compatible, HAZMAT shipments can be capped with general cargo to assist in meeting weight/cube goals.

Assembly

Before handling any cargo, ensure you have your required safety equipment, such as gloves and steel-toed footwear. Also, remember to use proper lifting techniques when lifting heavy pieces. Load dense cargo and crated/boxed cargo on the pallet first. Ensure cargo is stacked together with no gaps and distributed evenly. Stack crushable and light-density cargo on top of the load or use as filler cargo and place around the high-density or crated/boxed cargo. Restrain small-wheeled items or skidded cargo separately to the pallet in addition to the use of the nets. Monitor stacking to ensure cargo overhang is limited to unusual circumstances. Stack mail and other items without definite shape to minimize shifting on the pallet. Build pallets safely to enhance maximum pallet utilization, subject to aircraft and weight limitations and cargo loading characteristics. Evenly distribute heavy items from the center of the pallet outward.

When barrels, drums, or other unstable items are stacked more than one high, place plywood or other suitable material between each stack. Use material thick enough to prevent the cargo from shifting. Because the pallet is made of aluminum, metal items can be loaded directly on the pallet without anything separating the cargo and the pallet; however, use plywood or cardboard to protect the pallet surface when loading cargo with sharp edges or concentrated loads (rim of a 55-gallon drum). Give wooden warehouse skids a thorough inspection prior to use. Reject skids that are damaged or broken including protruding fasteners or unequal skid thickness.

Aircraft pallet load weights are limited by the aircraft roller limitations found in the applicable aircraft TOs and the pallet structural limitation of 250 psi, whichever occurs first. Shore cargo with plywood to increase the contact area when the 250-psi limit is exceeded and add additional shoring to comply with roller limitations.

After assembling the pallet in the desired configuration, the next step is to cover the contents with a plastic pallet cover. Plastic covers should fully cover the pallet to protect the contents from the elements.

Do not place plastic covers over subsistence items (e.g., dairy products, vegetables, fruits, rations etc.) received and shipped in multi-wall, wax-impregnated, corrugated fiberboard boxes. However, when such items are shipped in other containers (e.g., pasteboard boxes, etc.), place plastic covers over the nets, rolled up on all sides to top of cargo, and hold in place with straps. In extremely cold climates, place plastic covers over the entire pallet to protect these items from inclement weather. During hot weather, these items require ventilation to prevent spoilage. If the plastic is allowed to cover the entire pallet, trapped gases (normal respiration) of fruits and vegetables cause rapid ripening/spoilage of the produce. Provide these pallets inside storage in a cool, well-ventilated area to the maximum extent possible.

Protect household goods and unaccompanied baggage shipments from the elements by placing two plastic covers under the nets on all pallets. Always place personal property shipments in inside storage prior to processing and palletizing. It is permissible to use serviceable "used" pallet covers on personal property shipments. When receiving palletized personal property shipments from commercial carriers for entry into the airlift system, inspect the pallet covers for tears or rips. If any are found, reject the pallets.

Cargo that is too large for a single 463L pallet may be loaded on two or more pallets.

Damaged internal slingable unit (ISU) containers are accepted for channel movement only when empty and being returned for repairs. These damaged ISU containers are placed on a base-support pallet separated by three longitudinal rows of dunnage or four warehouse skids (if dunnage is not available). The ISU container is secured to meet aircraft tie-down restraint criteria and meet aircraft roller limitations.

Containers that are warped; have unserviceable or loose attachments; exposed, deteriorating balsa core; external delamination; or any punctures to the underside of the base-support pallet that contacts the rollers will not be accepted for movement during deployments from home stations. If ISU containers are damaged during the course of the deployment, they may be accepted for airlift empty and placed on a base-support pallet as described above, so the ISU can be returned to the depot for repair.

Restraining the cargo

Secure cargo to the pallet during pallet build up IAW TO 35D33-2-2-2 and the applicable aircraft TO. Just like pallets, inspect tie-down equipment used to restrain cargo to the pallets for damage. Do not use damaged tie-down equipment. Compute tie-down requirements and attach tie-down equipment in pairs (i.e., if devices, chains, or straps are used on one side of the pallet, use an equal number of devices, chains, or straps on the opposite side). Inspect nets for damage (e.g., cuts, frays, missing components, etc.). Do not use damaged nets.

Do not mix chains and straps to provide restraint in the same direction. Although materials stretch in proportion to the applied load, different materials have different rates of stretch. Nylon devices stretch more readily than steel under tension. Therefore, when two or more tie-down devices are required to restrain a unit of cargo, the devices must be of the same type and the ties must be approximately the same length. Never lace or weave through the net in such a manner to prevent the tie leading off in a straight line in the direction of pull.

When pallets are restrained with aircraft tie-down equipment (chains and devices), the limiting factor are the pallet rings, which are only rated at 7,500 lbs. each. You may have to add additional restraint.

If you restrain the pallet to the aircraft floor, then the aircraft-pallet rail system and the floor tie-down point are the limiting factors. Do not overtighten tie-down devices; overtightening tends to bow the pallet and cause warping. However, tie-down devices should be snug and final tightening should be done after the pallet is loaded aboard the aircraft.

When a single 463L pallet is restrained with nets (two side nets and one top net), the pallet net weight limit is 10,000 lbs. Do not attach top and side net hooks to the webbing material of the nets. Attach the hooks to the highest level of side rings on or near the top of the cargo, leaving enough space to tighten the top net. Tighten all nets and stow all loose ends to prevent them from interfering with aircraft loading operations.

When low-profile bulk/high-density cargo is loaded on pallets, side nets may be used for restraint without the top net, provided the side nets are pulled tight and secured by tie-down straps. Connect the straps to the highest level of side rings on or near the top of the cargo. Use a minimum of seven straps: four longitudinal on the 108-inch side and three lateral straps on the 88-inch side.

When low-profile cargo/mail does not permit the use of side nets, the top net will provide restraint in all directions, provided the pallet does not exceed a height of 45 inches or net weight of 2,500 lbs. If either the 45-inch height or 2500-lb. weight is exceeded, use the appropriate aircraft TO to determine the additional amount of straps or chains to provide proper forward, lateral, and aft restraint. In this case, the top net will only provide vertical restraint. When using straps, usually, creating “belly bands” will provide sufficient restraint. Use four straps to provide restraint around the entire pallet.

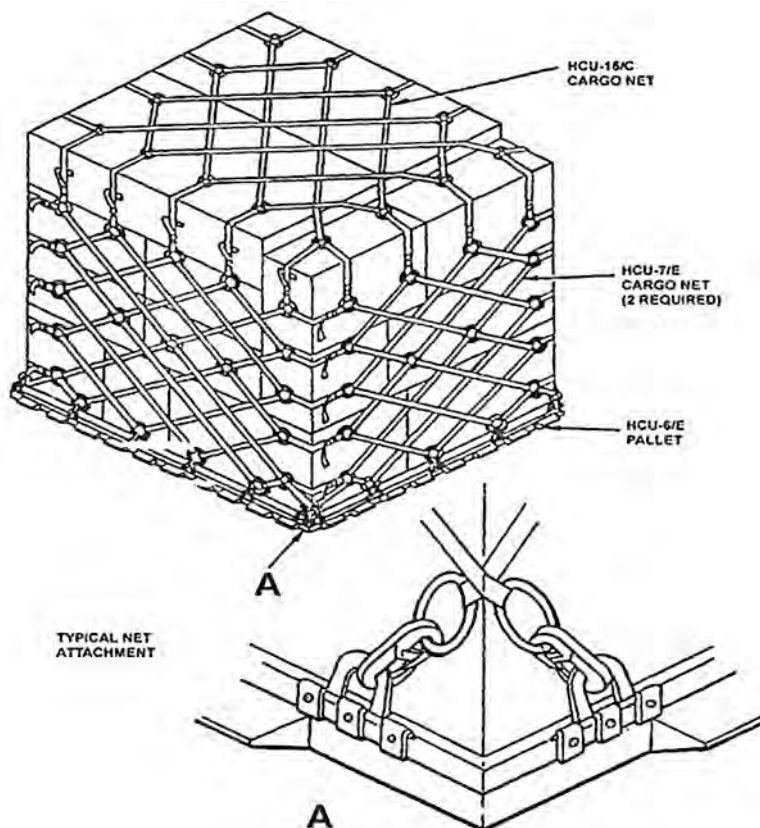


Figure 1-19. 463L pallet and net assembly.

Use two side nets around the sides of the pallet and one top net across the top to secure the load to the pallet (fig. 1-19). These three nets weigh 65 lbs.

Use the following procedures in attaching 463L pallets:

1. With one side net, beginning at any corner, fasten net-attaching hooks to pallet D rings around the pallet to the opposite diagonal corner. Using another side net, continue fastening net-attaching hooks to D-rings around the pallet to the beginning corner.
2. Fasten side nets together using fastening devices at each end of net side pieces.
3. Throw the top net over the cargo load and fasten it to the side nets using the fastening devices (hooks) provided on the top and side nets. Do not connect the hooks to the net webbing or the bottom row of side net rings.
4. Lock all fastening devices securely.

Weighing, measuring, and storing pallets

Weigh each originating loaded pallet to determine the total weight of the pallet (i.e., contents, nets, and pallet). Annotate this weight on the DD Form 2775, Pallet Identifier, and enter it into GATES as the gross weight.

If the terminal is not equipped to weigh pallets, total the weights of the contents of the pallet (net or documented weight) and the weight of the pallet and nets (tare weight). Straps, chains, and devices are included as normal aircraft equipment and, therefore, are treated as zero weight.

The standard weights for 463L pallets and nets are as follows:

- One empty pallet = 290 lbs.
- One set of side nets = 44 lbs.
- One top net = 21 lbs.

Weigh dunnage and fore and aft restraint barriers and include the tare weight.

Total the weights of each TCMD for each shipment on the pallet to get the documented weight.

Subtract the tare weight from the gross weight to determine the net weight. Compare the net weight with the documented weight, these two figures should be the same. Originating stations will investigate differences of plus or minus 150 lbs. by breaking down the pallet and weighing each piece of cargo on the pallet. This procedure will also help to identify any over/short shipments.

Originating terminals incapable of weighing 463L pallets will individually weigh all items.

Cargo originating from non-AMC locations will have quality checks on at least 10 percent of all cargo received (i.e., remeasure outside dimensions for over/outsized cargo, remeasure/weight and recalculate C/B for items requiring a CB, reweigh items over 1,000 lbs. or when weight discrepancies are suspected, and correct all markings and reaccomplished placards as required).

Measure all heights from the upper surface of the pallets. The normal stacking height of netted cargo or mail on a single pallet is 96 inches. The maximum height limitation depends on the type of aircraft and is found in the applicable aircraft TO 1C-XXX-9.

Place completed pallets in appropriate grid locations.

When deploying units prepare their cargo for movement, they reference the DTR, Part III, Appendix O to ensure they have prepared it properly. The following pallet build-up checklist comes from that Appendix, which can be helpful for aerial port personnel as well. Because we are the experts, we have much more to consider, but this checklist is a good foundation for any movement.

- a. Are you prepared to follow good safety practices?
 - (1) Do personnel have steel-toed safety shoes and work gloves?
 - (2) Have personnel been briefed on proper lifting techniques?
- b. Is the pallet skin free of damage, top and bottom, and any bent lips on the pallet perimeter?
- c. Are tie-down rings serviceable?

- d. Is the pallet level and not warped?
- e. Is the pallet free of corrosion?
- f. Is the pallet clean and free of dirt?
- g. Is the pallet right-side up?
- h. Is the pallet placed on three-point dunnage?
- i. Is cargo to be placed on the pallet securely packaged?
- j. Does cargo have required markings?
- k. Is DD Form 1387-2 properly prepared for any classified item and sensitive cargo requiring protective service or other special services?
- l. Are HAZMAT labels prepared and attached to hazardous cargo or their containers IAW AFMAN 24-204(I), Preparing Hazardous Materials for Military Air Shipments?
- m. Is cargo marked with arrows (e.g., "This Side Up," placed with arrows pointing up)?
- n. Are hazardous items on pallet or within an ISU/freight container compatible IAW AFMAN 24-204(I)?
- o. Are all hazardous cargo positioned for easy access during flight IAW AFMAN 24-204(I)? Are hazardous cargo labels visible from an 88-inch side of the pallet? Do the doors of mobility bins containing hazardous items open to an 88-inch side of the pallet?
- p. Is cargo arranged on the pallet to meet the following criteria:
 - (1) Are the heavier boxes and crates placed on the bottom of the pallet load?
 - (2) Is lighter, more fragile cargo placed on the top of the pallet load?
 - (3) Is the cargo arranged and properly stacked so that it is stable?
- q. Is the height of the built-up pallet 96-inches or less from the top skin of the pallet? If it is not and the height cannot be reduced to under 96-inches, consult your affiliated Air Movement Control Unit for guidance to determine if the pallet will fit inside the aircraft. Is the cargo loaded so it is no more than 104-inches wide with no overhang over either of the 108-inch sides?
- r. Is the pallet loaded with no more than 10,000 lbs. of cargo? Is pallet loading limited to less than 250 lbs. per square inch on the pallet's surface? Is plywood or cardboard used on pallet surface when cargo has sharp edges?
- s. Is cargo susceptible to weather damage? If so, is a plastic pallet cover used before installing cargo nets?
- t. Is cargo secured to the pallet using two side nets and a top net? If low-profile cargo does not permit the use of side nets (and weight does not exceed 2,500 lbs. and cargo height does not exceed 45 inches from the surface of the pallet), is restraint provided by a minimum of seven straps (four longitudinal and three lateral)?
- u. Does the top net have five serviceable clips? Does each side net have five serviceable hooks along each side of its length: four along each side of its width, and one at each corner? Are nets free of tears, rips, and broken rings?
- v. Is dunnage (three rows of the required size) provided for each pallet?
- w. Are keys or combinations provided to any locked containers?
- x. Is a copy of the Air Transportability Test Loading Agency (ATTLA) air transportability certification for vehicles and equipment, if required, available? Is shoring required by certification available?

209. Building multi-pallet trains

It may be necessary to use more than one pallet to transport items exceeding the usable dimensions of a single pallet. This is when you will marry pallets together with aluminum pallet spacers or IAW TO 36M-1-141 to make a pallet train.

Cargo selection is the same as when selecting cargo for a single pallet. Also, just as when you are building single pallets, inspect for cleanliness and damage prior to use. Pallet trains must be assembled on a rollerized surface, such as a hi-line dock or rollerized flatbed, capable of supporting the gross weight of the train load. The rollerized surface must be accessible to the conveyance used to transport the train to the aircraft.

When possible, place long items on pallets in a manner to evenly distribute the weight on all pallets. Use dunnage, if necessary, to help distribute the weight evenly. Include dunnage in tare weight. You must take into consideration aircraft limitations, such as roller, height, contour, and safety aisle factors. These limitations can be found in the applicable aircraft TO 1C-XXX-9. Do not forget to

consider what type of MHE is required to handle the pallet trains at originating, en route, and terminating stations. It would make no sense to build and send a six-pallet train to a station that only has 25K loader capability.

When securing general cargo on pallet trains, three side nets and two top nets can be used for a two-pallet train. Four side nets and three top nets shall be used for a three-pallet train. Properly secured nets provide the necessary restraint. To use nets, the maximum load on two- and three-pallet trains is 26,000 lbs. as long as the height is 96 inches or less. Pallet trains measuring 96–100 inches maximum must be limited to 21,000 lbs.

In most cases though, some type of chain bridle with restraint barriers or individual chains and devices will be used to secure cargo on pallet trains. The restraint barrier (at least $\frac{3}{4}$ -inch plywood) can be used with forward and aft restraint to secure loose, heavy items that shift in flight, such as lumber, pipe, long metal/wood/cardboard boxes, and so forth. Additional layers may be needed to adequately restrain these items. Include these items in tare weight.

210. Compute center of balance

The C/B must be determined to compute the weight and balance of a loaded aircraft accurately. The shipper is responsible for weighing and marking each item with the correct gross weight and a C/B point. Marking the C/B is not necessary on individual 463L pallets. If pallets are built correctly, the C/B will be at or near the center. The shipper will mark the C/B on *both sides* of all cargo items that meet the following criteria:

1. All pallet trains.
2. All vehicles/rolling stock.
3. Any item with a C/B at a point other than its center.
4. Any item 10 feet (120 inches) or longer.

Before weighing, shippers should ensure their scales are certified so the weight is accurate. They will weigh one axle at a time to determine each axle's weight. They will measure the distance from the front end of the vehicle to each axle or other required point to determine the distances.

You are responsible for verifying these weights and distances, so the same requirements apply to you. First, make sure your scales are working properly and are certified. Then, determine each distance required to calculate the C/B and weigh each axle individually. The final step is to verify the cargo is marked properly. Let's go over the steps to calculating the C/B.

Terminology and abbreviations

Before we dive into the calculations, you need to become familiar with a few terms. Figure 1–20 shows some of the basic terms.

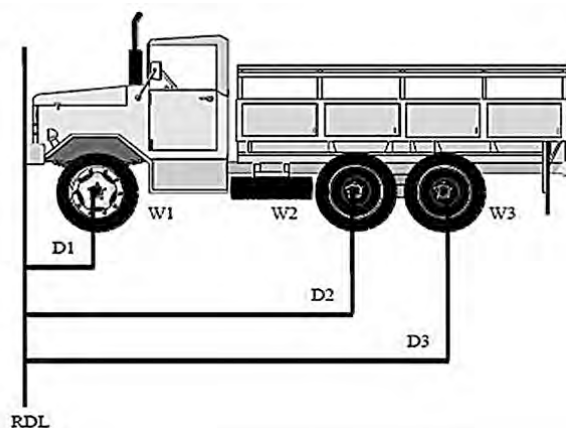


Figure 1–20. C/B terms illustrated.

General Terms and Abbreviations		
Term	Abbreviation	Definition
Reference data line	RDL	An imaginary point from which all measurements are taken for balance purposes, usually the very front of an aircraft, vehicle, or pallet.
Arm/station		The distance between a fixed point of reference (the RDL) to the C/B of an item.
Center of balance from the front end	CBFFE	The balance point of an item measured in inches from the front end.
Moment		Also called inch-pounds, it is the product of the weight of an item and its arm.

Distance Terms and Abbreviations		
Term	Abbreviation	Definition
Overall length	OAL	The total distance from the front to the rear of a vehicle.
Front overhang	FOH	The distance from the front of the vehicle to the center of its front axle.
Rear overhang	ROH	The distance from the center of the rear axle to the rear end of the vehicle.
Wheel base	WB	The distance between the center of the front axle and the center of the rear axle.
Distance 1	D1	The distance from the front of the vehicle to the center of its front axle.
Distance 2	D2	The distance from the front of the vehicle to the center of its second axle.
Distance 3	D3	The distance from the front of the vehicle to the center of its third axle.
Front axle weight	FAW	The total weight exerted at the front axle of a vehicle.
Rear axle weight	RAW	The total weight exerted at the rear axle of a vehicle.
Middle axle weight	MAW	The total weight exerted at a middle axle of a vehicle. If there is more than one, they can be labeled MAW1, MAW2, etc...
Gross weight	GW	The total weight of a given vehicle.
Weight 1	W1	The total weight exerted at the first axle of a vehicle.
Weight 2	W2	The total weight exerted at the second axle of a vehicle.
Weight 3	W3	The total weight exerted at the third axle of a vehicle.

Distances and weights (D1, D2, W1, W2, etc.) are numbered according to how many axles a particular vehicle has. There will not always be a W3 and D3 on every vehicle, and there may be a W4 and D4 on a particular vehicle. It just depends on the type of vehicle.

Determining the C/B for pallet trains

The C/B for trains will be computed and conspicuously marked on both sides of the train. Highline docks and 40-foot rollerized semi-trailers can be stenciled in inches as an aid in computing pallet train CBs.

1. Calculate the total inch-pounds (moment) of the load by multiplying the pallet station where the C/B of each piece of cargo is positioned by the weight of the cargo.
2. Total these figures to obtain the total load inch-pounds.
3. Divide the total load inch-pounds (moment) by the total load weight.
4. Round to the nearest whole inch (as per DTR, Part III, Appendix P). The vehicle C/B is computed to the nearest whole inch. Any answer with a fraction of 0.5 or higher is increased to the next higher number. If 0.4 or less, the number will be dropped.

The C/B location of the total load is equal to the total inch-pounds (moment) of the load, divided by the total weight of the load.

Let's look at a couple examples to help you understand how to do them. The *first step* is to calculate the total inch-pounds or moment by multiplying the pallet station where the C/B of each piece of cargo is positioned by the weight of the cargo. To do this, let's make a table with the numbers from figure 1-21 we need on it.

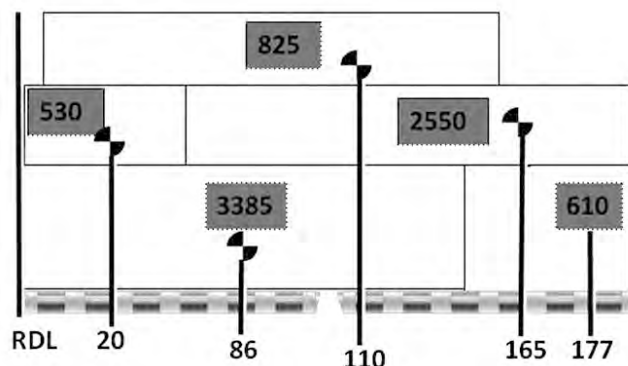


Figure 1-21. Multi-pallet train CB, example 1.

Weight	X	Arm (Distance)	=	Moment (Inch-pounds)
530	X	20	=	10,600
3385	X	86	=	291,110
825	X	110	=	90,750
2550	X	165	=	420,750
610	X	177	=	107,970

The *second step* is to add the moments to get the total moments or inch-pounds. In doing this, we get 921,180 total moments.

The *third step* is to divide the total inch-pounds (moment) by the total load weight. But, in this example, the total weight is not given to us; we must figure it out. In doing this, we get 7,900 lbs. Therefore, we now can divide the total inch-pounds by the total weight.

$$921,180 \div 7,900 = 116.6$$

The *fourth and final step* in calculating C/B is to round to the nearest whole inch. Using normal rounding procedures, we would round up to 117.

Our C/B for this multi-pallet train is 117 inches from the front end or 117 inches C/BFFE.

Let's try another example. Look at figure 1-22.

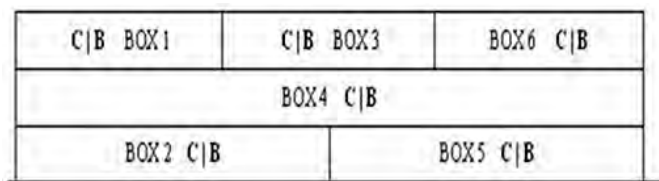


Figure 1-22. Multi-pallet train, example 2.

For this example, we'll use a list of the necessary numbers.

Box Number	Station	Weight
BOX 1:	30	250
BOX 2:	50	1,800
BOX 3:	85	325
BOX 4:	150	1,500
BOX 5:	160	2,000
BOX 6:	183	150

Using our table created from the previous example, let's calculate the CB.

Weight	X	Arm (Distance)	=	Moment (Inch-pounds)
250	X	30	=	7,500
1,800	X	50	=	90,000
325	X	85	=	27,625
1,500	X	150	=	225,000
2,000	X	160	=	320,000
150	X	183	=	27,450
6,025	TOTALS			697,575

If we divide our total moments by our total weight, we get 115.7 inches. Using normal rounding procedures, we round to 116 inches CBFFE.

Determining the C/B for vehicles and rolling stock

Let's determine the weight and C/B of a vehicle after all secondary cargo is inside and secured for airlift. Secondary loads are items of baggage or cargo transported in truck beds and trailers and must be included in the total weight of the vehicle. Adding to or removing cargo from a weighed and marked vehicle will force reweighing and recomputing the C/B.

Load-carrying vehicles are calculated and marked indicating an *empty or loaded C/B*. Improperly marked items are not accepted for airlift since an unknown weight and C/B represents an unsafe condition concerning aircraft weight and balance.

Trailers and associated prime movers must be individually/separately calculated and marked, even if they are connected on the aircraft. This prevents delays if vehicles must be disconnected or shipped on separate aircraft en route.

To calculate the C/B for rolling stock and vehicles, you must know how the vehicle will sit on the aircraft. For example, a six-passenger truck has four wheels, and all four wheels will contact the aircraft floor. Some trailers, however, in order to be towed, have a stand on the tongue that folds up and down. Because trailers do not usually stay attached to their prime movers (towing vehicles) during flight, we must fold that stand back down on the aircraft. Because that stand will carry part of the trailer's weight, we treat that point just like an axle. On some trailers, such as aircraft engine trailers, the tongue will be removed or strapped up and out of the way. We need to know these things *before* we can properly calculate a C/B for vehicles.

Therefore, to calculate the C/B for vehicles and rolling stock, you first need the weight of every axle on the vehicle or every point the vehicle will carry weight. You also need the distances of each of those points. After that, it is just like calculating the C/B for a multi-pallet train.

Let's first calculate the C/B for the two-axle vehicle shown in figure 1-23.

Let's make our table to make it easier to calculate.

Weight		X	ARM (Distance)		=	Moment (Inch-pounds)
W1	1,550	X	D1	28	=	43,400
W2	3,450	X	D2	115	=	396,750
	5,000		TOTALS			440,150

If we divide our total moments by our total weight, we get 88.0 inches. It is already at the nearest whole inch so there is no need to round.

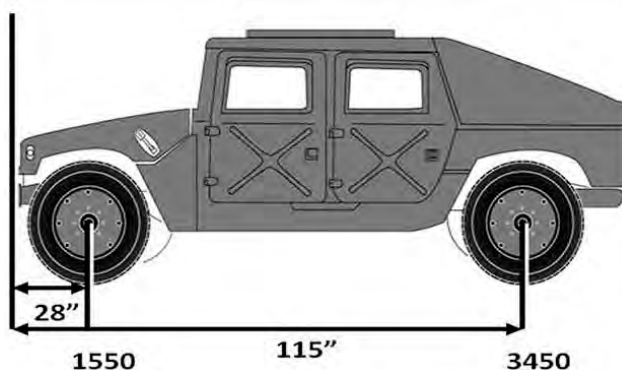


Figure 1-23. Two-axle vehicle.

Now, look at a trailer (fig. 1-24). Remember, just because a vehicle does not have two-wheeled axles does not mean we do not count the tongue weights.

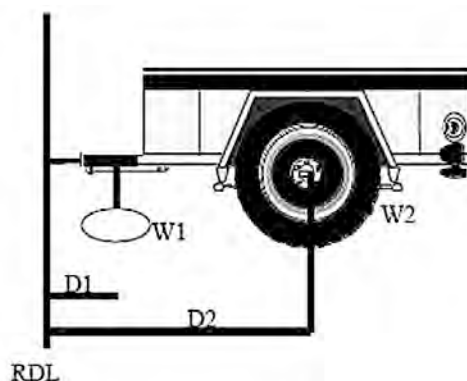


Figure 1-24. Trailer.

For this trailer, we will use the following information:

W1 (tongue): 175 lbs.

D1: 12 inches.

D2: 115 inches.

GW: 1,295.

Now, we will calculate the C/B with the information we have. If you noticed, you were not given the rear axle weight (W2). How would you figure that out? Simply subtract the tongue weight (W1) from the gross weight of the vehicle. 1,295 lbs. minus 175 lbs. equals 1,120 lbs.—that is your W2 or rear axle weight.

Weight		X	Arm (Distance)		=	Moment (Inch-pounds)
W1	175	X	D1	12	=	2,100
W2	1,120	X	D2	115	=	128,800
	1,295		TOTALS			130,900

Dividing the total moments by the gross weight, we get 101.0 inches. Again, we do not have to round since it is already at the nearest whole number. The CBFEE for this vehicle is 101 inches.

Let's use figure 1-25 to calculate the C/B for a multi-wheeled vehicle.

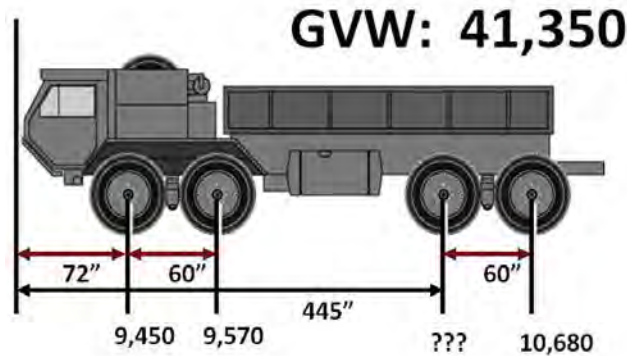


Figure 1-25. Multi-wheeled vehicle.

There are a few things we have to figure out on this one. We need two distances and one axle weight *before* we can calculate the CB, as indicated by the thicker borders.

Weight		X	Arm (Distance)		=	Moment (Inch-pounds)
W1	9,450	X	D1	72	=	
W2	9,570	X	D2		=	
W3		X	D3	445	=	
W4	10,680	X	D4		=	
	41,350		TOTALS			

First, to obtain the weight for W3, we subtract each of the other axle weights from the gross weight of the vehicle. When we do this, we get 11,650 lbs.

Second, for D2, we have to add D1 (72 inches) and the distance between D1 and D2 (60 inches) because, remember, all distances start from the RDL at the front of the vehicle, not from other axles. When we add those two together, we get 132 inches for D2.

Lastly, to obtain the distance for D4, we must add D3 (445 inches) and the distance between D3 and D4 (60 inches). The distance measurement must start from the RDL every time. Adding those two together, we get 505 inches for D4.

Now, look again at our table, we can fill in the blanks and calculate the moments.

Weight		X	Arm (Distance)		=	Moment (Inch-pounds)
W1	9,450	X	D1	72	=	680,400

Weight		X	Arm (Distance)		=	Moment (Inch-pounds)
W2	9,570	X	D2	132	=	1,263,240
W3	11,650	X	D3	445	=	5,184,250
W4	10,680	X	D4	505	=	5,393,400
	41,350		TOTALS			12,521,290

Sometimes the numbers do get very large, which is why you must use caution when doing your calculations. Always calculate at least twice to make sure you have it right.

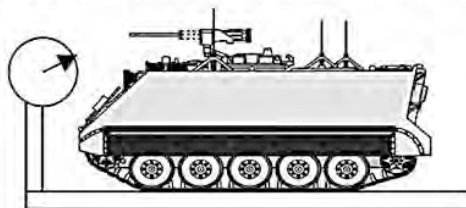
Dividing the total moments by the total weight, we get 302.8 inches. Using normal rounding procedures, we end up with 303 inches CBFFE.

Determining the C/B for tracked vehicles

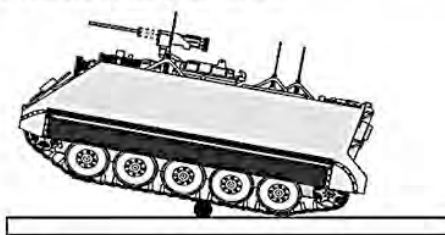
Figure 1-26 illustrates how to calculate the C/B for tracked vehicles. There is really no calculation involved. Use extreme caution when performing this activity. Only an authorized driver can operate the vehicle and must remain in the vehicle at all times. Keep all personnel not involved away from the operation.

Determine CB of Tracked Vehicles.

Step 1. To determine weight, drive the vehicle onto a platform scale (truck scale or coal yard scale) large enough to accommodate the entire vehicle. Record weight.



Step 2. To determine CB, drive the vehicle onto a wooden beam or pole until it tilts forward. Mark the side of the vehicle at the point of tilt.



Step 3. Mark the CB and gross weight of the vehicle.

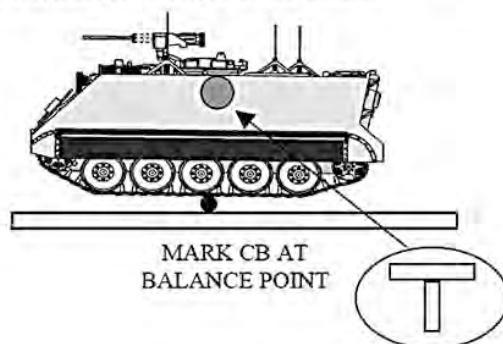


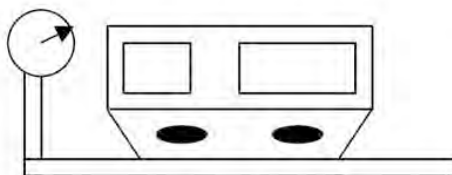
Figure 1-26. C/B for tracked vehicles.

Determining the C/B for other types of cargo

Figure 1-27 illustrates how to calculate the C/B for skid mounted or other cargo. You must use caution when performing this activity as well. Only authorized forklift drivers will operate the forklift and all other personnel must stay away from the cargo.

Determine CB of Skid-Mounted Cargo.

Step One. If the skid-mounted cargo will fit on the scale, weigh the whole load to use as weight figure.



Step Two. Determine the CB by placing the load onto a pipe and centering the cargo until it balances, then mark CB.

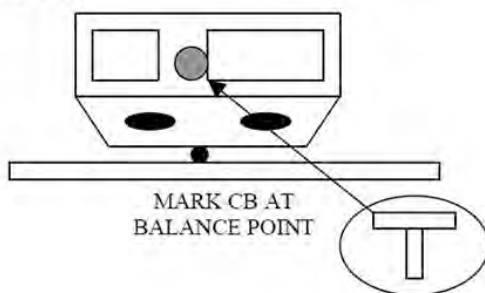


Figure 1-27. C/B for skid mounted cargo.

Marking cargo

Once we have checked all the calculations for our weights and C/Bs, we must ensure all cargo is marked properly. On vehicles, each axle weight *must* be marked *above* the axle it represents on *both* sides of the vehicle with weather-resistant tape. In addition, the C/B and the gross weight of the item (vehicle, train, tank, or other item) must be marked on both sides using weather-resistant tape and grease pencil/permanent marker, forming the letter “T”, as shown in figure 1-28. Do not use tape to mark the C/B locations on AGE with permanently mounted C/B markings.



Figure 1-28. Properly constructed C/B marking.

Preparing the Pallet Invoice	
Block	Description
Document Identifier Code	Enter "TAB" for pallet header information.
Pallet Identifier Code	Enter the pallet ID.
APOE	Enter the air terminal identifier code.
Oldest SET	Enter the GMT hour/code of the oldest piece of cargo on the pallet.
Grid Location	Enter the grid location of where the pallet is stored.
Time/Date Pallet Started	Enter the GMT hour/code of when you started building the pallet.
Time/Date Pallet Completed	Enter the GMT hour/code of when you completed the pallet.
APOD	Enter the APOD air terminal identifier code.
General Special Hazard Cargo	Enter one of the following: G (general cargo), S (cargo requiring special handling), M (mixtures of general and special cargo), or U (mail).
Amount of Tie-down	Enter one of the following: C (chains), S (straps), N (nets), or M (mixture).
Type of Aircraft	Enter the type of aircraft the pallet is built for. You can also enter the pallet configuration code to be more specific (i.e., R for ramp, E for belly pallet, etc.)
Overhang Inches	Enter the number of equivalent pallet positions the pallet requires. For example, if the pallet is a multi-pallet train requiring two pallets with 40 inches of aft overhang, enter 2.4. This pallet will take up 2.4 pallet positions on the aircraft.
Pallet Variations Ramp—Trains Mixed	Enter one of the following: BC (belly cargo), LS (loose cargo), PC (palletized cargo), RS (rolling stock), SD (cargo on a skid), T_ (pallet train; enter the number of pallets in the train in the second position—i.e., T2 for a two-pallet train; T3 for a three-pallet train, etc.)
Gross Scale Weight	Enter the gross weight of the pallet.
Documented Weight	Enter the net weight of the pallet.
Highest Priority Shipment	Enter the highest priority on the pallet (don't forget about green sheet and purple sheet, if applicable).
Signature of Cargo Processor	Self-explanatory.

TCN Detail Information (Enter this information for each TCN on the pallet)	
System Entry	Enter the GMT hour/code of when the TCN entered the airlift system (from the TCMD).
Transportation Control Number	Enter the first 15 digits of the TCN.
Split	Enter the last two digits of the TCN.
Process time	Enter the time the TCN was processed.
Pieces	Enter the number of pieces in the shipment placed on the pallet.
Weight	Self-explanatory.
Cube	Self-explanatory.

After completion of AMC Form 39, review the document for accuracy and sign the pallet processor and quality control signature lines on the pallet invoices in two copies. Place the duplicate signed copy in the plastic bag with the DD Form 2775 and attach to the 463L pallet. The load planner uses the original copy of the pallet invoice for selecting and planning mission loads. Pallet invoices are filed in Load Planning and kept for 30 days after the pallet has departed.

Pallet identifier

GATES assigns each originating pallet, pallet train, and each piece of rolling stock a pallet identifier. Pallet IDs in GATES are six characters:

- 1st three characters: the air terminal identifier code of the air terminal that built the pallet.
- 4th and 5th characters are alphanumerical (I, O, and 0 are never used).
- 6th character is always an alpha character (I and O are never used).

Manual terminals will maintain an orderly tracking system to ensure pallet identifiers are *not* duplicated. During manual procedures, prepare two copies of DD Form 2775 (fig. 1-30) to identify all completed 463L pallets, trains, and rolling stock. You must complete all entries and attach the copies to the upper left-hand corner at eye level (when pallet height permits), one on the 88-inch side and one on the 108-inch side. Place the form inside interlocking-closure plastic bags, along with one copy of the pallet invoice or content listing. Do not staple through the webbing material of the nets. Over time, the nets can develop several tiny holes or tears caused by repeated stapling, which will damage the nets and reduce restraint capability.

PALLET IDENTIFIER			
1. PALLET IDENTIFICATION NUMBER 1CA		2. AIRCRAFT CONFIGURATION C-17	
3. ORIGINATING STATION WRI		4. DESTINATION STATION RMS	
5. NET WEIGHT (Lbs.) 1987		6a. STRAPS 0	6b. CHAINS 0
		6c. DEVICES 0	6d. NET SETS 1
7. MISCELLANEOUS INFORMATION/THIS PALLET CONTAINS: 4B12 72" G CARGO		8. GROSS WEIGHT (Lbs.) 2330	
		9. SCALE WEIGHT CERTIFICATION	
		a. NAME ADAMS	b. GRADE SRA
		c. DATE (YYYYMMDD) 20120103	
		10. CUBE THIS PALLET 189	

DD FORM 2775, SEP 1998 REPLACES AF FORM 2279, MAY 84, WHICH IS OBSOLETE. Author: Professional 8.0

Figure 1-30. DD Form 2775, Pallet identifier.

Entries on the form are self-explanatory and consist of the following:

1. Enter POE and POD codes in letters as large as possible. The intent is to make the entries visible from a distance when pulling pallets for a load.
2. Annotate the highest priority cargo on the pallet (e.g., "9" [999], "G" [General], "S" [Special Handling] or "GS" [Green Sheet] "PS" [Purple Sheet]) in the miscellaneous information block. Also, include pallet height in this block.
3. Never reflect the words "classified," "small arms/weapons," "munitions," or other highly sensitive items by name on this form.
4. Annotate the number of straps, chains, devices, and net sets used on a particular pallet or pallet train in the appropriate blocks of the form.
5. Complete the scale-weight certification block by legibly printing the name and grade of the individual who performed the weighing of the pallet.

212. Creating radio frequency identification tags

We have already talked about RFID tags a little bit, but here is where the rubber meets the road. RFID tags allow combatant commanders (CCDR) to track cargo through the DTS using an RFID interrogator infrastructure, which allows them visibility of where their equipment is. GATES is programmed to capture content-level detail data from the Defense Automatic Addressing System (DAAS) at the time a TCN is in-checked to the aerial port. This data is written to the RFID tag with the GATES transportation data during the pallet-capping process. GATES then transmits both pieces of data to the Army's radio frequency (RF) ITV server.

Active RFID tags receive low-level RF signals from an interrogator and then generate high-level signals back to the reader/interrogator, which can be a handheld device or a permanently mounted device. Data is normally written to an RFID tag via a USB port or docking station (read and write device) but may also be written via radio signals. Active RFID technology offers long-range (300 feet or more) interrogation from permanently mounted interrogators. These tags are ideally suited for use on 463L pallets.

RFID tags are generated for originating and retrograde 463L pallets, outsized/oversized shipments (including pallet trains and rolling stock), and palletized ammunition. This also includes originating cargo that will be landbridged from your location. RFID-tagged pallets that are broken or uncapped, and have cargo either added or removed, must have the RFID tag rewritten by the port making the change to reflect the updated TCMD/pallet information created by the changes. The following shipments do not meet the definition of sustainment or retrograde cargo and do not require RFID tags: household goods, unaccompanied baggage, DCS material, rations, 463L assets, Denton Amendment cargo, classified, mail, and jingles shipments.

Do not place RFID tags on in-transit or unit-move pallets that do not already have RFID tags attached (unit-movement items are tagged by the owning unit).

Prior to entering the Pallet Processing function in GATES, ensure an RFID tag is operational by removing the battery and reinserting it. The RFID should beep twice; if it does not beep twice, replace the battery. Insert the RFID tag into the RFID tag docking station (TDS) or USB. An RFID tag must be in the TDS prior to entering the Pallet Processing function or you will not be able to write a tag.

Attach RFID tags to the pallet netting using two nylon-tie wraps (zip ties), preferably in a "vertical" orientation. Attach the tag near the top left corner of the pallet, on a side containing a pallet placard. Ensure the RFID tag is attached outside of any plastic or over wrapping. On low-profile pallets, attach the RFID tag on the top of the pallet as close to the center as possible.

Attach RFID tags near the placard on equipment or in a location where the tag will not sustain damage. Also, ensure it is in a location that reasonably assures tags can be interrogated as the cargo flows through the movement process. In addition, the RFID tags must be on the outside of the piece of equipment.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

207. How to maintain and care for 463L assets

1. What is the rated capacity of each of the rings on a 463L pallet?
2. What is considered a misuse of a 463L pallet?

3. When moving pallets over ground surfaces, what three things should you *not* do?
4. How many rows of dunnage should you use to place under pallets, and what should the measurements be?
5. Describe how to winch a pallet properly.
6. Why *must* you ensure pallets, cargo, and equipment are clean before shipping them?
7. How dirty can pallets and equipment be for shipment?
8. Why should empty pallets *not* be stacked upside-down?
9. What are the stacking and dunnage requirements for storing pallets?
10. When inspecting pallets, which types of damage will require you to remove the pallet from the airlift system?
11. What damage to pallet rings is considered unserviceable?
12. Why should warped pallets be removed from the airlift system?
13. When can you dispose of condemned pallets?
14. Describe how to ship a stack of empty 463L pallets for airlift.
15. What is the *maximum* number of pallets you can ship for airlift using only chains and devices or straps?

16. What is the *maximum* restraint load for one set of 463L nets?
17. Which two elements cause the *most* damage to nets?
18. During inspection, what types of damage causes removal of nets from the airlift system or replacement of parts?
19. What are the requirements for shipping nets?
20. What type of damage to a CGU-1/B strap causes removal from the airlift system?
21. What should you inspect for on MB-1 and MB-2 chains and devices?
22. On which aircraft are standard couplers used, and how many inches are the pallets spaced apart?
23. How many inches do KC-10 couplers space pallets apart?
24. For what is a CART responsible?
25. Who is responsible for accounting for, issuing, and controlling pallets, nets, chains, straps, RFID tags, and other equipment?
26. How do home stations account for the amount of tie-downs issued to each aircraft?
27. For contingency/SAAM missions, who must provide tie-down equipment for the restraint of pallets?
28. What form is used to issue tie-down to aircraft that are not assigned to AMC?

29. How do pallet and net managers keep track of pallets and nets issued to other units?
30. At an en route station, if there is no AF Form 4069, what must the tie-down representative do?
31. Upon return to the home station, how does the tie-down representative ensure the aircraft returned with the same amount of equipment it left with?
32. How often *must* pallet and net managers submit the AMC Key Asset and Equipment Report?

208. Building single pallets

1. Cargo is palletized according to what factors?
2. What is a pure pallet?
3. When building one pallet for more than one destination, how do you separate the cargo for identification and offload?
4. Which type of cargo is loaded on the pallet *first*?
5. When unstable items are stacked more than one high, what *must* you do?
6. When *must* you place plywood or cardboard on the pallet?
7. When *must* you shore cargo on a pallet?
8. When covering pallets with plastic, which items are *not* covered?
9. Which type of cargo *requires* two plastic covers?

10. When accepting a damaged ISU container in a deployed location, what are the requirements for shipment?
11. Why can you *not* mix tie-down in the same direction?
12. When applying a chain and device to a pallet ring to restrain cargo, how much restraint is provided?
13. What happens if you overtighten a tie-down device?
14. When using *only* side nets *without* a top net on pallets, what *must* you do?
15. When can you use *only* a top net when restraining a pallet?
16. What are the standard weights for 463L equipment?
17. Originating stations *must* break down the pallet and weigh each individual piece if the net weight is different from the documented weight by how *many* pounds?
18. The heights of the pallets are measured from which point?

209. Building multi-pallet trains

1. Where must a multi-pallet train be built?
2. What is the *maximum* load on a two- or three-pallet train when using net sets?
3. How thick must the plywood be when using it as a restraint barrier for loose/heavy items that may shift in flight?

210. Compute center of balance

1. Why must the C/B for equipment be determined?
2. Which items require a C/B marking on *both* sides?
3. Match each term in column B to its description in column A. Items in column B may be used once, more than once, or not at all.

*Column A**Column B*

- | | |
|--|-----------------|
| ____(1) The total distance from the front to the rear of the vehicle. | |
| ____(2) The total weight exerted at the front axle of a vehicle. | a. RDL. |
| ____(3) The distance between the center of the front axle and the center of the rear axle. | b. Arm/Station. |
| ____(4) An imaginary point from which all measurements are taken, usually the front end of a vehicle, aircraft, or pallet. | c. Moment. |
| ____(5) The distance from the front of the vehicle to the center of its front axle. | d. OAL. |
| ____(6) The product of the weight of an item and its arm. | e. FOH. |
| ____(7) The distance between a fixed point of reference to the C/B of an item. | f. WB. |
| | g. FAW. |

4. Calculate the C/B for the following multi-pallet train:

Box Number	Weight	Arm
BOX 1	2,500	45
BOX 2	435	61
BOX 3	380	86
BOX 4	165	92

5. Calculate the C/B for the following multi-pallet train:

Box Number	Weight	Arm
BOX 1	9,800	132

6. What would *require* you to reweigh and recompute a C/B for a given vehicle?
7. If a vehicle can carry a secondary load, but has *no* load inside, what must you include on the C/B marking?
8. If a trailer is connected to its *prime* mover during flight, how will the C/B be calculated?

9. Calculate the C/B for the following vehicle:

Weight		Distance		Moment
W1	2780	D1	32	
W2	2430	D2	86	

10. Calculate the C/B for the following trailer:

Weight		Distance		Moment
W1	120	D1	18	
W2	2165	D2	63	

11. Calculate the C/B for the following vehicle:

Weight		Distance		Moment
W1	2275	D1	48	
W2	2300	D2	84	
W3	4115	D3	161	
W4	4200	D4	199	

Use the following information on a multi-axle vehicle to answer questions 12 through 15:

GW: 28,000 pounds	FOH: 48 inches	ROH: 32 inches
W1: 6,750 pounds	D2: 132 inches	
W3: 8,500 pounds	D3: 178 inches	

12. What is W2?

13. What is D1?

14. What is the OAL of this vehicle?

15. What is the CBFFE of this vehicle?

16. How do you calculate C/B for a tracked vehicle?

17. How do you calculate C/B for skid-mounted and other cargo?

18. Where are axle weights marked on vehicles?

19. What information does the C/B marking contain?

211. Preparing pallet documentation

1. In how many copies is the AMC Form 39 prepared, and how are they distributed?
2. In how many copies is the DD Form 2775 prepared, and how are they placed on the pallet?

212. Creating radio frequency identification tags

1. RFID tags are generated for which type of cargo?
2. Which type of shipments does *not* meet the definition of sustainment or retrograde cargo in relation to generating RFID tags?
3. When function checking an RFID tag, what does it mean when it does not beep twice?
4. How do you attach RFID tags to the pallet?

Answers to Self-Test Questions**201**

1. An agency or vendor that originates shipments.
2. (1) Determine the information necessary to complete the shipping documents.
(2) Prepare a DD Form 1384.
(3) Offer the shipment to the ACA for clearance into the DTS.
(4) After clearance, pack and prepare the shipment for movement.
3. The ACA.
4. It provides a way to process a shipment through the ACA; it provides notification to the APOE that a shipment is inbound and requires further transfer; and allows APOEs to easily and efficiently manifest the shipment.
5. Applies any required markings and labels, or RFID tags; prepares any additional documents required for shipment; and makes arrangements to deliver shipment to the transshipment point.
6. The consignee or the final destination of the shipment.
7. Verifying the shipment is complete; ensuring that any special equipment required used to transport, handle or tie-down the equipment is received with the shipment; and removing and deactivating the RFID tag, if required.
8. Any transportation activity, other than the shipper or receiver, which handles or documents the transfer of a shipment between conveyances.
9. Receives, consolidates, processes, and forwards shipments from multiple shippers, such as depots, vendors, and other authorized shippers within the CONUS, who don't regularly have enough cargo to fill a 463L pallet, for shipment to a single overseas agency or activity.

10. The ACA.
11. They provide shipment information to air terminals; coordinate movement of classified cargo and courier material; monitor overseas retrograde cargo back into the CONUS; divert, expedite, hold, and track cargo; provide movement and receipt information; assist the shipper in preparing and correcting movement documents; determine if shipments are routed properly and challenge shipments that do not meet airlift requirements.
12. Helps to ensure an orderly flow of cargo and advises the ACA of anything affecting an orderly and expeditious flow through the aerial ports.
13. (1) e.
(2) b.
(3) c, d, e.
(4) a.
(5) c.
(6) c, d, e.
(7) b.
(8) a.

202

1. It provides the clearance authorities, ports, receivers, and other interested transportation personnel with advance notice of shipments and the information necessary to document and process each shipment through the DTS. It is also used to in-check cargo and mail shipments and report cargo and mail port levels and movements. Also, the form is used as the basis for preparing air manifests and recording cargo and mail transactions.
2. (1) Prime data is the required, basic information for every shipment; (2) trailer data is the shipment's supplemental information and is only required for certain types of shipments.
3. Part II, Appendix M.
4. The TMDS website.
5. The DODAAC of the consignor or ordering activity.
6. A "0" (zero) in position 15.
7. 999, 444, 555, 777, N_, and E_.
8. TP-4.
9. Using the GMT hour code and the last two digits of the Julian date.
10. To link movement authority, funding approval, and accounting data for shipments of cargo and personal property in the DTS.

203

1. The shipment is in the right place, all pieces on the document are accounted for, all the documentation accompanying the shipment matches each other, screen for HAZMAT, damage, leaks, evidence of pilferage, and proper marking and labeling.
2. MIL-STD 129.
3. ID markings and labels tell you what the item is; handling markings and labels tell you how to treat and handle the shipment; and address markings and labels tell you where the shipment came from, where it is going, and other pertinent information.
4. Reprint and attach the required number of bar-coded MSLs.
5. 10 cubic feet.
6. Document the damage by circling the line item on the shipping documentation, annotating exactly what the damage is in the space provided or on the reverse, and accept and immediately frustrate the cargo.
7. When the discrepancy is minor and you are able to correct it on the spot.
8. Shipments that, due to some discrepancy or request of the shipper, cannot be accepted into, or continue movement within, the airlift system.
9. AMC Form 33.

10. Three copies. Place the original on the number one piece of the shipment. The work center frustrating the cargo retains the second copy. Give the third copy to CSB/ACA or other appropriate authority.
11. CSB/ACA returns the original AMC Form 33 to the work center that frustrated the cargo so they compare it to the one they have on file and ensure all discrepancies are corrected.

204

1. Starts AMC possession time and establishes SET.
2. Write the GMT hour code and last two digits of the Julian date in the appropriate block on both TCMDs or other shipping documentation (CBL/GBL, waybill, or manifest). Sign the duplicate copy of the TCMD and return it to the carrier as a receipt.
3. As soon as possible, within six hours of receipt time.
4. Prepare a TCMD for each piece and change the MSL to reflect the split and correct weight and cube.

205

1. Cargo moving by commercial air or surface transportation from one port to another where GATES capabilities exist on both ends.
2. By air or surface. Certain rules apply.
3. The GMT and Julian date of the aircraft block time in the upper right-hand corner.
4. Prepare a substitute manifest (DD Form 1385) for the items to start processing them.
5. Break each pallet down and take the appropriate information from the shipping labels.
6. AMC Form 156.
7. Manually check the cargo/mail against the accompanying manifests and other documentation to ensure each shipment unit is complete and properly documented.
8. (1) d.
(2) e.
(3) c.
(4) c.
(5) b.
(6) f.
(7) c.
(8) b.
9. Enter the location and date received on TCMD, when received. When the shipment is completely processed for onward movement, enter the GMT hour and Julian date code and the two-digit warehouse-bay location on the TCMD. Place the cargo in the appropriate warehouse-bay location.
10. The time the shipment is completely processed for turnover to the receiving agency.
11. Inspect the pallet for airworthiness and verify the documentation is correct. Ensure the DD Form 2775 is correct and re-placard if necessary. Assign a grid location and "cap" the pallet.
12. Remove the nets and tie-down and check them for serviceability. Remove the RFID tag and flip the battery around. Place each item in its designated storage area.

206

1. An official written document that lists the name, rank, and organization of individuals authorized to pick up the cargo.
2. When they are the owning unit of unit mobility cargo and when they are employees of the USPS.
3. Two years.
4. When the air terminal and TMO are both under the operational control of AMC and are located in the same facility.
5. Aerial port-cargo processing personnel.

207

1. 7,500 lbs.

2. Using it for building materials and intra-theater surface transportation beyond initial delivery of air cargo.
3. Do not push, pull, or slide them over ground surfaces.
4. Three rows of uniform dunnage 88-inches long and at least 3-inches thick.
5. Use at least two attaching points for the chain or cable, preferably the tie-down rings at each corner of the pallet.
6. Because destructive pests, such as the gypsy moth, brown tree snake, and snails, can hitchhike on cargo and destroy crops, damage resources, and disrupt the export of agricultural commodities.
7. Only a thin film of road dust is allowed.
8. It could cause the pallet tie-down rings to swing under the pallet and cause damage to the pallets beneath it.
9. They can be stacked 50 high as long as dunnage is placed under each stack of 10 and all the rings are lowered.
10. Corrosion, warpage, delamination, damaged rails, and loose or missing hardware.
11. Cracked, pitted from corrosion, and deformed rings that prevent connecting the net hook.
12. They could get stuck in or damage the aircraft rail system and cause delays.
13. When directed by the MAJCOM or DOD pallet and net monitor.
14. Stack up to a maximum of 20 pallets, excluding the base-support pallet. Separate the first pallet from the base pallet by three rows of dunnage placed equal distances apart or by placing four wooden warehouse skids of equal thickness to cover the entire surface of the base pallet.
15. Five.
16. 10,000 lbs.
17. Direct sunlight (heat) and moisture.
18. Rusting so bad, the moving parts won't move, hardware twisted or bent out of shape, and welding cracks in the rings.
19. Dry nets thoroughly and pack in boxes lined with a water-vapor proof barrier material, label with the type and quantity of nets contained and tag with the appropriate condition tag.
20. Deformities (bent fingers), slipping cotter pins, cracks, deep scores, free-moving parts, misassembled parts, broken springs, and frayed or excessively worn straps.
21. On chains inspect for cracks, damage, or deformity of links, excessive wear, and corrosion. On devices inspect for cracks, corrosion, bent or worn parts that impair the function of the device.
22. C-5, C-17, and C-130 aircraft and spaced two inches apart.
23. One inch.
24. Identifying 463L assets, evaluating serviceability, and arranging transportation for pallets and other assets for reinsertion into the airlift system.
25. The pallet/net and tie-down equipment manager.
26. By using an AF Form 4069 or an AF Form 1297.
27. The deploying units.
28. AF Form 1297.
29. Using a custodial log.
30. Generates one based on the arrival tie-down inventory and annotates "Issued by XXX (station code)" at the top of the form.
31. By performing an inventory and comparing the station file copy with the aircraft copy.
32. Weekly.

208

1. Destination, transportation priority, movement indicator, and SET.
2. A pallet that contains only shipments destined to a single DODAAC or SSA.
3. Using plastic covers or suitable substitute inserted between each destination.
4. Dense and crated/boxed cargo.
5. Place plywood or other suitable material between each stack.

6. When loading cargo with sharp edges or concentrated loads.
7. When the 250-psi limits have been exceeded.
8. Subsistence items (dairy products, vegetables, fruits, etc.) received and shipped in multi-wall, wax-impregnated, corrugated fiberboard boxes.
9. Household goods and unaccompanied baggage shipments.
10. It must be empty and must be placed on a base-support pallet separated by three longitudinal rows of dunnage or four warehouse skids (if dunnage is not available). The ISU container must be secured to meet aircraft tie-down restraint criteria and meet aircraft roller limitations.
11. Different materials have different rates of stretch.
12. 7,500 lbs.
13. It will bow the pallet and cause warping.
14. Pull side nets tight and secure tie-down straps. Connect the straps to the highest level of side rings on or near the top of the cargo. Use a minimum of seven straps: four longitudinally and three laterally.
15. When the pallet does not exceed 45 inches in height or 2,500 lbs. If the pallet exceeds either one of these, you must add additional restraint.
16. One empty pallet = 290 lbs.; one set of side nets = 44 lbs.; one top net = 21 lbs.
17. Plus or minus 150 lbs.
18. From the upper surface of the pallet.

209

1. Pallet trains must be assembled on a rollerized surface, such as a hi-line dock or rollerized flatbed, capable of supporting the gross weight of the trainload and must be accessible to the conveyance used to transport the train to the aircraft.
2. The maximum load on two- and three-pallet trains is 26,000 lbs. as long as the height is 96 inches or less. Pallet trains measuring 96 to 100 inches maximum must be limited to 21,000 lbs.
3. $\frac{3}{4}$ -inches.

210

1. To accurately compute the weight and balance of a loaded aircraft.
2. (1) All pallet trains.
(2) All vehicles/rolling stock.
(3) Any item with a C/B at a point other than its center.
(4) Any item 10 feet (120 inches) or longer.
3. (1) d.
(2) g.
(3) f.
(4) a.
(5) e.
(6) c.
(7) b.
4. CBFFE = 54 inches.
5. CBFFE = 132 inches.
6. Adding to or removing cargo from a weighed and marked vehicle.
7. "Empty."
8. Individually/separately.
9. CBFFE = 57 inches.
10. CBFFE = 61 inches.
11. CBFFE = 140 inches.
12. 12,750 lbs.

13. 48 inches.
14. 210 inches.
15. CBFFE = 126 inches.
16. (1) Drive the vehicle onto a platform scale large enough to accommodate the entire vehicle.
(2) Drive the vehicle onto a wooden beam or pole until it tilts forward. Mark it at the point of tilt.
(3) Mark the C/B and GW of the vehicle.
17. (1) Weigh the item.
(2) Place the item on a pipe and center the cargo until it balances, then mark the CB.
18. On vehicles, each axle weight *must* be marked *above* the axle it represents on *both* sides of the vehicle with weather-resistant tape.
19. The horizontal portion of the “T” will contain the gross weight information, and the vertical portion of the “T” will contain the letters “CB” and the number of inches from the RDL. Also, include an arrow to indicate which end of the vehicle is the front end.

211

1. Two copies. One goes in a plastic bag with the DD Form 2775 and attaches to the pallet. The second copy goes to load planning to select and plan mission loads.
2. Two copies. They each go in a plastic bag and attaches to the upper left-hand corner of the pallet—one on the 88-inch side and one on the 108-inch side.

212

1. Originating and retrograde 463L pallets, outsized/oversized shipments (including pallet trains and rolling stock), and palletized ammunition.
2. Household goods, unaccompanied baggage, DCS material, rations, 463L assets, Denton Amendment cargo, classified cargo, mail, and jingles shipments.
3. Replace the battery.
4. Attach RFID tags using two nylon-tie wraps, preferably in a vertical orientation, near the top left corner where the placard is located. Ensure they are placed outside of the plastic cover. On low-profile pallets, place the RFID tag on top of the pallet as close to the center as possible.

Complete the unit review exercises before going to the next unit.

Unit Review Exercises

Note to Student: Consider all choices carefully, select the *best* answer to each question, and *circle* the corresponding letter. When you have completed all unit review exercises, transfer your answers to the Field-Scoring Answer Sheet.

Do not return your answer sheet to the Air Force Career Development Academy (AFCDA).

1. (201) The Advance Transportation Control and Movement Document (ATCMD) is not used to
 - a. provide a way to process a shipment through the Airlift Clearance Authority (ACA).
 - b. allow cargo processors to calculate critical leg Allowable Cabin Load (ACL) information.
 - c. allow Aerial Ports of Embarkation (APOE) to easily and efficiently manifest the shipment.
 - d. provide notification to the Aerial Port of Embarkation (APOE) that a shipment is inbound and requires further transfer.
2. (201) The shipper's second step and responsibility in the shipping process is to
 - a. determine the information necessary to complete the shipping documentation enlisting the help of the Air Clearance Authority (ACA).
 - b. pack and prepare the shipment for movement, applying any required markings, labels, or radio frequency identification (RFID) tags.
 - c. use all information gathered to prepare the DD Form 1384, Transportation Control and Movement Document (TCMD).
 - d. make necessary arrangements for delivery of the shipment to the transshipment point, referred to in the Defense Transportation Regulation (DTR) as "making the shipment".
3. (201) Another name for a receiver is a
 - a. vendor.
 - b. consignor.
 - c. consignee.
 - d. transshipper.
4. (201) Which agency challenges shipments in the Defense Transportation System (DTS) and is the critical link between the shipper, transshipper, and receiver?
 - a. Customer service branch (CSB).
 - b. Airlift Clearance Authority (ACA).
 - c. Direct vendor delivery (DVD) agency.
 - d. Consolidation and Containerization Point (CCP).
5. (201) When is a shipment, other than TP-4 cargo, considered cleared by the Airlift Clearance Authority (ACA)?
 - a. When the direct delivery vendor prepares the invoice.
 - b. When you have scanned the bar-coded label and determined it is not in the Defense Transportation System (DTS).
 - c. When the Consolidation and Containerization Point (CCP) has delivered an airlift-ready pallet to the Aerial Port of Embarkation (APOE).
 - d. When the ACA has not challenged the shipment by the hour/day entered in the Advance Transportation Control and Movement Document (ATCMD) date shipped field.

6. (202) What two types of data are entered on the Transportation Control and Movement Document (TCMD)?
 - a. Prime and trailer.
 - b. Prime and secondary.
 - c. Secondary and trailer.
 - d. Temporary and permanent.
7. (202) Which appendix in Part II of the Defense Transportation Regulation (DTR) explains how to fill out a Transportation Control and Movement Document (TCMD) block-by-block?
 - a. L.
 - b. M.
 - c. O.
 - d. P.
8. (202) What type of code represents the consignor/consignee blocks of the Transportation Control and Movement Document (TCMD)?
 - a. Air dimension code.
 - b. Document identifier (DI) code.
 - c. Air commodity and special handling code.
 - d. Department of Defense Activity Address Code (DODAAC).
9. (202) You can use the sponsoring service code followed by five zeros for a Department of Defense Activity Address Code (DODAAC) when
 - a. you cannot gain access to the DODAAC website.
 - b. you do not have a clear-text address to send the shipment.
 - c. the consignor or consignee does not have an assigned DODAAC.
 - d. you are in a deployed location and do not know how to query the location.
10. (202) What do the air commodity and special handling codes tell you?
 - a. How the shipment is packaged.
 - b. The nature of the shipment and how it should be treated.
 - c. Whether shipments have one or more outsized dimensions.
 - d. The specific method of transportation for each segment of movement.
11. (202) Which transportation priority (TP) includes shipments requiring routine transportation?
 - a. TP-1.
 - b. TP-2.
 - c. TP-3.
 - d. TP-4.
12. (202) The three-position date shipped code is comprised of the
 - a. three-digit Julian date.
 - b. estimated time of arrival (ETA) code and the last two digits of the Julian date.
 - c. Greenwich Mean Time (GMT) hour code and the last two digits of the Julian date.
 - d. GMT hour code and the ETA code.
13. (202) You use the transportation account codes (TAC) to
 - a. identify shipments that require special recognition.
 - b. identify the nature of the shipment and how to treat the shipment.
 - c. link movement authority, funding approval, and accounting data for shipments.
 - d. indicate the number of days a shipment will be in transit from the consignor to the aerial port of embarkation (APOE).

14. (202) What is the formula to determine the cube of a shipment?
 - a. $\text{Length} \times \text{width} \div 1385$.
 - b. $\text{Length} \times \text{width} \div 1728$.
 - c. $\text{Length} \times \text{width} \times \text{height} \div 1385$.
 - d. $\text{Length} \times \text{width} \times \text{height} \div 1728$.
15. (203) When a shipment arrives at the air terminal, your first job is to ensure the
 - a. cargo is frustrated properly.
 - b. shipment will fit on a given aircraft.
 - c. shipment is supposed to come to your air terminal.
 - d. driver has the required personal protective equipment (PPE).
16. (203) Which publication provides detailed guidance on how to mark and label cargo properly?
 - a. AFI 11-2C-XXX, Special Handling.
 - b. AMCI 24-101, Cargo and Mail Policy.
 - c. MIL-STD-129, Military Marking for Shipment and Storage.
 - d. TO 1-CXXX-9, Mail Policy.
17. (203) Identification markings and labels tell you
 - a. what the shipment is.
 - b. how to refuse a shipment.
 - c. how to handle a shipment.
 - d. where the shipment came from and where it is going.
18. (203) You place two military shipment labels (MSL) on any item over how many cubic feet?
 - a. 5.
 - b. 10.
 - c. 15.
 - d. 20.
19. (203) When a shipment with a discrepancy is delivered to your air terminal, you may refuse it
 - a. anytime; there are no restrictions.
 - b. when the shipper delivers the shipment.
 - c. when an intermediate carrier delivers the shipment.
 - d. when an Air Mobility Command (AMC) aircraft delivers the shipment.
20. (203) You must correct a discrepancy with a shipment received at your terminal
 - a. always; no exceptions.
 - b. when the shipper delivers the cargo.
 - c. when the discrepancy is minor and you can correct it on the spot.
 - d. when the discrepancy is major and requires significant repacking.
21. (203) Which form do you use to frustrate a shipment?
 - a. SF Form 361, Discrepancy Report (TDR).
 - b. SF Form 364, Report of Discrepancy (ROD).
 - c. AMC Form 33, Report of Frustrated Cargo.
 - d. DD Form 1387, Military Shipment Label (MSL).
22. (203) In how many copies of the Air Mobility Command (AMC) Form 33, Report of Frustrated Cargo, must be prepared?
 - a. 2.
 - b. 3.
 - c. 5.
 - d. 6.

23. (203) After the Customer Service Branch (CSB)/Airlift Clearance Authority (ACA) corrects the frustrated shipment and returns the original AMC Form 33, Report of Frustrated Cargo, to the work center that frustrated the shipment; what actions must the work center take?
- Initial both copies and retain them for their files.
 - Retain one copy for their files and discard the original.
 - Compare it to the copy they have on file to ensure all discrepancies were corrected and file them both.
 - Compare it to the copy they have on file to ensure all discrepancies were corrected and file the original.
24. (204) Using manual procedures, when you annotate the Greenwich Mean Time (GMT) hour code and last two digits of the Julian date of arrival on the Transportation Control and Movement Document (TCMD), what does it represent?
- The block time of the aircraft.
 - The system entry time (SET).
 - The required delivery date (RDD).
 - The time the shipment was frustrated.
25. (204) When the system entry time (SET) is equal for two or more shipments, you determine which shipments are processed first by using the
- air commodity and special handling code.
 - expedited handling indicators and the required delivery date (RDD).
 - transportation account code (TAC), project code, and type pack code.
 - split/partial shipment code, air dimension code, and document identifier (DI) code.
26. (204) Within how many hours of receipt must you process all cargo?
- 2.
 - 6.
 - 12.
 - 18.
27. (204) You finalize the receipt of a shipment by
- turning it over to the appropriate pallet build-up agency.
 - loading the shipment onto a K-loader and taking it out to the aircraft.
 - writing the warehouse location or assigned pallet identifier in block 25c of the TCMD.
 - completing a DD Form 1907, Signature and Tally Record, and having load planning personnel sign for the shipment.
28. (205) At manual stations or when a manual manifest is used, Air Terminal Operations Center (ATOC) personnel write which information on the inbound manifests they deliver to the cargo processing function?
- Greenwich Mean Time (GMT) and Julian date of the aircraft block time in the top left-hand corner.
 - System Entry Time (SET) and Julian date of the aircraft block time in the top left hand corner.
 - GMT and Julian date of the aircraft block time in the top right-hand corner.
 - SET and Julian date of the aircraft block time in the top right hand corner.
29. (205) When aircraft arrive without cargo manifests and Air Terminal Operations Center (ATOC) personnel attempt to acquire them, you must
- break all the pallets down and process them immediately.
 - wait until you receive the manifests to start processing all the cargo.
 - prepare a substitute manifest and start processing anything that requires immediate action.
 - store the cargo out of the way until you receive the manifests and process other shipments instead.

30. (205) Which Air Mobility Command (AMC) form is used to log *all* terminating cargo and mail manifests?
- 33.
 - 156.
 - 214.
 - 2775.
31. (205) A short shipment is a shipment that
- arrived at the air terminal open, torn, or cut.
 - arrived at the air terminal, but is not listed on the manifest.
 - is listed on the manifest, but did not arrive at the air terminal.
 - arrived at the air terminal but removed due to suspicion of pilferage.
32. (205) Who is responsible for initiating an immediate investigation to determine if pilferage has occurred for a shipment?
- Security Forces (SF) duty officer.
 - Traffic Management Office (TMO)/air freight.
 - Air Terminal Operations Center (ATOC) duty officer.
 - Customer Service Branch (CSB)/Airlift Clearance Authority (ACA).
33. (205) You leave in transit pallets intact, without removing the nets, tie downs, or radio frequency identification (RFID) tags when the pallets
- are terminating.
 - arrived with no manifests.
 - are destined for a single location.
 - are destined for more than one location.
34. (206) You must obtain a signature from everyone who picks up terminating cargo, except
- postal authorities, when picking up registered mail.
 - aircrew members, when using a cargo manifest.
 - truck drivers, who have shown their IDs at the front gate.
 - Traffic Management Office (TMO) personnel, when under operational control of AMC and located in the same facility.
35. (207) An 8,000-pound piece of cargo is built on a pallet and you are responsible for adding enough restraint to get the pallet to the aircraft. How many pounds can each ring on a 463L pallet restrain?
- 5,000.
 - 7,500.
 - 10,000.
 - 25,000.
36. (207) You are loading an aircraft and must winch a heavy pallet into position. As a *minimum*, how many attaching points will you use to safely winch this pallet on the aircraft?
- One.
 - Two.
 - Three.
 - Winching pallets is not authorized.
37. (207) You are deployed and a cargo user has offered several dirty cargo pallets for air transportation. Which one of the following is considered acceptable?
- A thin film of road dust.
 - Chunks of mud under a vehicle.
 - No amount of dirt is acceptable.
 - Dirt and sand that you can pinch with your fingers.

38. (207) You have been tasked to scout your deployed location to look for pallets that are inappropriately stored and provide guidance to the users on how to stack them properly. One user has hundreds of pallets scattered over the yard and wants to know what the *maximum* number of pallets that can be stacked for storage (provided adequate dunnage is appropriately placed)?
- 10.
 - 20.
 - 25.
 - 50.
39. (207) A cargo user has returned 60 empty 463L pallets to your unit, which you will be shipping to another location via air. How many of these pallets *maximum* can you ship in one stack, provided adequate dunnage is appropriately placed, and excluding the base support pallet?
- 20.
 - 30.
 - 40.
 - 50.
40. (207) Your supervisor has asked you to restrain four pallets in the warehouse with varying weights and heights. Which pallet is most effectively restrained with a full 463L net set?
- A 38-inch high pallet weighing 6,500 pounds.
 - An 89-inch high pallet weighing 8,225 pounds.
 - A 94-inch high pallet weighing 10,500 pounds.
 - A 100-inch high pallet weighing 12,150 pounds.
41. (207) You are building a multi-pallet train using one-inch couplers. Which aircraft can this train be loaded on, assuming it is properly configured?
- C-5.
 - C-17.
 - C-130.
 - DC-10.
42. (207) You are issuing three CGU-1/B straps to an Air Force Special Operations Command (AFSOC) C-130. Which form would you use to maintain accountability for the items issued to this aircraft?
- AF Form 1297, Temporary Issue Receipt.
 - Pallet and Net Monitor Local Custodial Log.
 - AF IMT 4069, Tie-down Equipment Checklist.
 - AMC Form 8001, AMC Key Asset and Equipment Report.
43. (208) You are building a pallet destined for Aviano AB, Italy (AVB), and only have space for one more piece of cargo on the pallet. All of the available pieces have the same destination and transportation priority. Which two other factors will you use to consider which piece to build?
- Weight and system entry time (SET).
 - Movement indicator and type pack.
 - Movement indicator and SET.
 - Aircraft fuselage station and movement indicator.
44. (208) When internal slingable unit (ISU) containers are damaged during deployments, they may be accepted for airlift so the ISU can be returned to the depot for repair. How must they be prepared for airlift?
- Empty and placed on base support pallet.
 - Fully loaded on base support pallet.
 - Loaded with no more than 5000 lbs.
 - Loaded with no more than 5000 lbs on base support pallet.

-
-
45. (208) You must break down an originating pallet and individually weigh each piece of cargo if there is a difference of how many pounds between the documented and actual weight?
- 100.
 - 150.
 - 200.
 - 355.
46. (209) When building multi-pallet trains, you may need to use dunnage to help distribute the weight evenly. The weight of the dunnage is annotated as what kind of weight?
- Net.
 - Tare.
 - Gross plus.
 - Not annotated.
47. (209) What must be considered when building a multi-pallet train?
- Immigrations clearance.
 - Supply of pallet covers.
 - Multi-pallets in back log.
 - Materials handling equipment (MHE) required to handle the pallet train.
48. (210) Who is responsible for weighing and marking each item with the correct gross weight and center of balance (C/B) point?
- Shipper.
 - Load master.
 - Load planner.
 - Joint inspector.
49. (210) You received several shipments in for airlift; which one will you *not* mark with a center of balance (C/B)?
- Small piece of rolling stock weighing 500 pounds.
 - Shipment of pipes that are 13 feet long.
 - Three-pallet train.
 - Single pallet.
50. (210) If the shipper decides to remove cargo from a weighed and marked vehicle, what must be re-accomplished?
- Remarking and reweighing.
 - Reweighing and recomputing C/B.
 - Remarking and reaccomplishing Joint Inspection.
 - Reweighing and reaccomplishing Joint Inspection.
51. (211) When preparing the Air Mobility Command (AMC) Form 39, Pallet Invoice, for a pallet, which information belongs in the "Oldest SET" block?
- Clear text Greenwich Mean Time (GMT) and Julian date of the oldest piece on the pallet.
 - Transportation control number (TCN) of the oldest piece on the pallet.
 - GMT hour/code of the first piece you placed on the pallet.
 - GMT hour/code of the oldest piece on the pallet.
52. (211) Which two manual forms must *both* be placed on a completed 463L pallet after it is built?
- AMC Form 39, Pallet Invoice and DD Form 2775, Pallet Identifier.
 - DD Form 1907, Signature and Tally Record and AMC Form 39, Pallet Invoice.
 - DD Form 1907 and DD Form 2775, Pallet Identifier.
 - AMC Form 1015, HazMat Inspection and Acceptance Checklist and DD Form 2275, Pallet Identifier.

53. (212) Active radio frequency identification (RFID) technology offers long-range interrogation from permanently mounted interrogators. What *minimum* distance is considered “long range”?
- a. 3 feet.
 - b. 10 feet.
 - c. 100 feet.
 - d. 300 feet.
54. (212) When you attach the radio frequency identification (RFID) tag to a pallet, ensure it is attached
- a. inside the pallet cover.
 - b. on the bottom right corner of the pallet.
 - c. outside of any plastic or over wrapping.
 - d. near the highest priority piece of cargo.

Unit 2. Hazardous and Special Cargo

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YOU HAVE A LOT OF RESPONSIBILITIES as an air transportation journeyman, but HAZMAT, explosives, and special cargo could be the most important responsibility you have. The lives of passengers, aircrew, and even your coworkers depend on the safe handling and transportation of HAZMAT. This unit covers your role in the safe handling of HAZMAT, explosives, and various types of special cargo, such as human remains (HR), classified and security shipments, expedited shipments, perishable shipments, and registered mail.

2-1. Hazardous Cargo

Your job, by nature, includes a certain amount of risk just by working in and around warehouses and aircraft, but HAZMAT and explosives make your job even riskier. You must always remain aware of your surroundings and use your risk management (RM) steps, but this is especially true when working with HAZMAT and explosives. The more you know about these types of materials, the better you will be able to make informed decisions about how to handle them.

213. Hazardous materials and explosives

Let's first define HAZMAT and explosives. A *HAZMAT* is a substance or material capable of posing an unreasonable risk to health, safety, and property when transported. HAZMAT can also be called hazardous cargo or dangerous goods. An *explosive* is an item, substance, or mixture of substances, which under external influences, is capable of rapidly releasing energy in the form of gas or heat. Explosives can include such items as ammunition, pyrotechnics, mines, bombs, grenades, warheads, missiles, and components of aircraft systems. The cardinal principle of explosives safety is: expose the minimum number of people to the minimum amount of explosives for the minimum amount of time. Supervisors are responsible for enforcing explosive exposure guidelines for their personnel. As you might imagine, you need to be trained in how to handle both types of material.

Roles and training

All the different levels identified in this section must comply with rules designed to maximize safety and security of the aircraft, aircrew, passengers, and cargo. They must know the exceptions, special permits, and waivers to federal laws that are unique to military airlift operations and how to apply them. Inspectors and preparers must have access to and review the HAZMAT Information Files (HMIF). The HMIF, which may be a manual file or DOD websites, contains messages, updates, and changes concerning HAZMAT.

Handlers

HAZMAT handlers are people who *only handle* HAZMAT or HAZMAT documentation. Handlers include warehouse workers, aircraft load teams, pallet build-up personnel, and other people who come into contact with HAZMAT but do *not package, inspect, or certify*.

Inspectors

HAZMAT inspectors ensure HAZMAT are properly prepared and documented for transportation within the DTS or by commercial carriers. Inspectors are knowledgeable in the use of commercial and military HAZMAT documents and shipping papers. Inspectors should also be familiar with appropriate packaging specifications. Inspectors can fill the same roles as handlers, such as warehouse workers, aircraft load teams, pallet build-up personnel, and others since being an inspector is a higher qualification than being a handler.

The commander designates personnel “HAZMAT Inspector Qualified” in writing. Inspector-qualified personnel may be able to perform the following tasks:

1. Complete and sign AMC Form 1015, HAZMAT Inspection and Acceptance Checklist.
2. Issue a passenger deviation IAW AMCI 24–101, Vol 9, *Air Terminal Operations Center*.
3. Sign the hazardous-brief sheet or manifest statement.
4. Load plan HAZMAT shipments.
5. Conduct joint inspections (JI) IAW DOD 4500.9R, Part III, *Mobility*.

Packers

HAZMAT packers *package HAZMAT but do not sign any legally binding documents*. Many times, packers and preparers are the same person, but if not, they must work closely with the preparer to ensure the package is properly prepared.

Preparers

HAZMAT preparers (also called *certifiers*), by signing legally binding documents, certify that all types of HAZMAT are properly classified, packaged, marked, labeled, and in proper condition for transportation within the DTS or commercial carriers on a daily basis. Preparers are authorized to accomplish the SDDG certification. Preparers can also include technical specialists, who we talked about in volume one. Technical specialists are trained locally by qualified instructors and are only authorized to certify specific items they are technically qualified to maintain and prepare for shipment.

Because preparer-qualified personnel are certified at a higher level than inspector-qualified personnel, they may perform the same functions and duties or perform in the same roles as an inspector or handler-qualified individual. This means that they can complete and sign the AMC Form 1015, issue a passenger deviation, sign the hazardous-brief sheet or manifest statement, load plan HAZMAT, and conduct JI. They can also perform in roles such as warehouse worker, aircraft load team member, pallet build-up person, and others. Anything a handler or inspector can do, the preparer can do as well. The commander identifies preparers in writing as “HAZMAT Preparer Qualified.” Air terminal preparer-qualified personnel may also instruct the certification phase of technical specialist training if approved by the host base transportation function but will not be used as instructors for the packaging/preparation phase of this training.

Training

Unit commanders assign HAZMAT workers into one of the four functional groups and the training is based on which group you are assigned. All HAZMAT personnel receive initial training and refresher training at 24-month intervals. The training for each level must address: HAZMAT general awareness and familiarization; safety procedures to include emergency response; security awareness IAW the DTR, Part II, Chapter 205; and responsibilities directly relevant to the individual’s role in HAZMAT

transportation. In addition, personnel whose duties involve contact with explosives must receive *annual explosives safety training* IAW AMCI 24-101, Volume 22, *Air Transportation Training Requirements*.

Handlers

Handler training covers basic HAZMAT familiarization, awareness, and communication requirements. This includes hazard classification, marking, labeling, placarding, documentation, compatibility, and safety (including emergency response information). Training also includes handling and job (function) specific requirements. Attachment 25 in AFMAN 24-204, *Preparing Hazardous Materials for Military Air Shipments*, lists the approved training in handling HAZMAT, including the Air Freight web-based training course. This training is annotated and filed in a personnel's Training Records.

All personnel (supervisory and nonsupervisory) who operate, handle, transport, or load missiles, explosives, or nuclear weapons must receive initial and annual refresher weapons safety training IAW AFI 91-202, *The US Air Force Mishap Prevention Program*.

Inspectors

Inspectors usually attend the HAZMAT Inspectors Course offered at Fort Lee Army Post, Virginia for initial training and complete the exportable web-based refresher course every 24 months. Most aerial port personnel who work with HAZMAT daily are inspector certified.

Preparers

Aerial port personnel, if required to be preparer trained and certified, usually attend the HAZMAT Preparer Course offered at Fort Lee Army Post, Virginia for initial training and complete the exportable refresher course every 24 months.

Identifying HAZMAT and explosives

When working with HAZMAT, you need to know how they are grouped or classed. Knowing the various classes will help you know how to handle and inspect the cargo as well as how to respond in the event of an emergency. The classification also tells you how the shipment should be marked, labeled, documented, and placarded.

Classification of hazards

HAZMAT are classed according to the hazardous properties of the material.

Class 1 Explosives

Class 1, an item in hazard class 1 (fig. 2-1), is any substance or article (including a device) that is designed to function by explosion (i.e., an extremely rapid release of gas and heat). The term "explosive" may also refer to an item that is able to produce a chemical reaction within itself and is able to function in a similar manner even if not designed to function by explosion. Explosives in class 1 are divided into six divisions as follows:

1. Division 1.1—Explosives that have a *mass explosion hazard*. A mass explosion is one which affects almost the entire load instantaneously.
2. Division 1.2—Explosives that have a *projection hazard* but not a mass explosion hazard.
3. Division 1.3—Explosives that have a *fire hazard and a minor blast hazard or a minor projection hazard* (or both) but not a mass explosion hazard.
4. Division 1.4—Explosive devices that present a *minor explosion hazard*.
5. Division 1.5—Very insensitive explosives that have a *mass explosion hazard with a low probability of detonation*.
6. Division 1.6—Extremely insensitive articles that *do not have a mass explosion hazard*.



Figure 2-1. Class 1.

Class 1 items are even further divided into compatibility groups which are identified by a letter following the division number. For example, in a shipment classified as 1.2D, “1.2” signifies the division and the “D” signifies the compatibility group. You will not be required to know all of the compatibility groups by letter, only how they apply to handling explosives.

Class 2.1 flammable gas

Class 2.1 is any gaseous material that has a specific boiling-point range, gas pressure, and one of several ignitable and flammable ranges (fig. 2-2).

Class 2.2 nonflammable, nonpoisonous compressed gas, (including compressed)

Class 2.2 is any material or mixture which has a specific internal pressure at 20 degrees (°) Celsius (C) (68° Fahrenheit [F]) and does not meet the definition of a Class 2.1 or 2.3 (fig. 2-2).

Class 2.3 gas, poisonous by inhalation

Class 2.3 is any gaseous material that has a specific boiling-point range and gas pressure and is also so toxic to humans that it poses a hazard to health during transportation (fig. 2-2).



Figure 2-2. Class 2.

Class 3 flammable liquid

Class 3 is a flammable liquid is any liquid having a flash point equal to or below 60.5°C (141°F), except any liquid meeting the definition of a Class 2 material (fig. 2-3).



Figure 2-3. Class 3.

Class 4.1 flammable solids

Class 4.1 flammable solids consist of solids (other than those classed as explosives) which are readily combustible under conditions encountered in transport or may cause or contribute to fire through friction (fig. 2-4).

Class 4.2 spontaneously combustible material

Class 4.2 has liquids or solids which are prone to spontaneous heating under normal conditions encountered in transport or to heating in contact with air, thus being liable to ignite are considered Class 4.2 (fig. 2-4).

Class 4.3 dangerous when wet material

Class 4.3 consists of solids that are liable to become spontaneously flammable or emit flammable gases when they come into contact with water (fig. 2-4).



Figure 2-4. Class 4.

Class 5.1 oxidizers

Class 5.1 is material that may cause or enhance the combustion of other material, generally by yielding oxygen (fig. 2-5).

Class 5.2 organic peroxides

Class 5.2 is any organic compound containing oxygen and is thermally unstable. These substances may be prone to explosive decomposition or rapid burning, be sensitive to impact or friction, react dangerously with other material, or cause damage to the eyes. Class 5.2 materials are grouped into seven types, from type A (most unstable) to type G (most stable) (fig. 2-5).



Figure 2-5. Class 5.

Class 6.1 poisonous material

Class 6.1 is a material, other than a gas, which is so toxic to humans as to afford a hazard to health during transportation or is presumed to be toxic to humans because it falls within one of the test categories identified in 49 Code of Federal Regulations (CFR) 173.13.2. The term “toxic” and “poisonous” are used *synonymously* (fig. 2-6).

Class 6.2 infectious substances

Class 6.2 is a material known to contain or suspected of containing a pathogen is Class 6.2 (fig. 2-6). A pathogen is a virus or micro-organism that has the potential to cause disease in humans or animals. Division 6.2 materials are assigned to the following transport categories:

- Category A—An infectious substance which is transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening, or fatal disease to humans or animals.
- Category B—An infectious substance which does not meet the criteria for inclusion in Category A. Formerly known as “diagnostic specimens,” Category B materials are now described as “Biological Substances, Category B.”

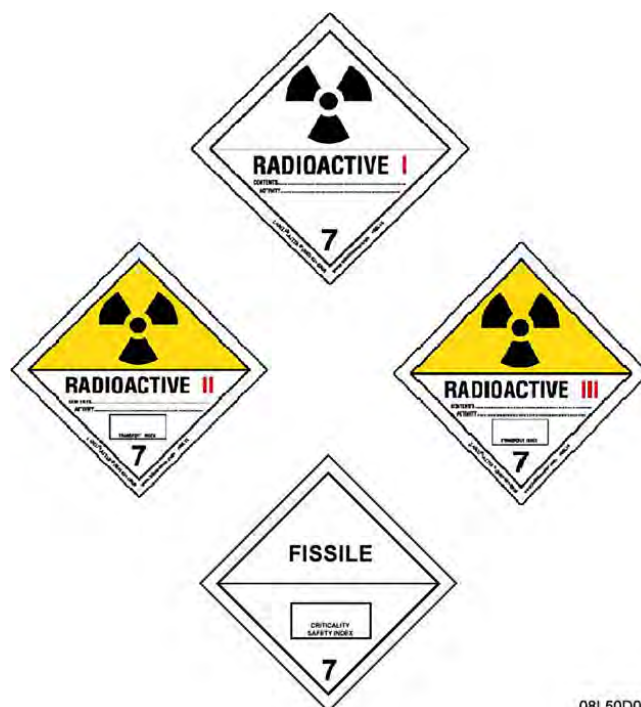


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Figure 2-6. Class 6.

Class 7 radioactive material

Class 7 is any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values outlined in AFMAN 24-204 (fig. 2-7).



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Figure 2-7. Class 7.

Class 8 corrosive material

Class 8 are liquids or solids that cause visible destruction or irreversible alterations in human skin tissue on contact. If the packaging leaks, the liquid will have a severe corrosion rate on other materials, such as steel and aluminum. The main hazard from Class 8 liquids and vapors is the corrosive effect on humans and the aircraft or cargo. Some Class 8 materials have very dangerous additional hazards, such as toxicity, flammability, and explosiveness (fig. 2-8).



Figure 2-8. Class 8.

Class 9 miscellaneous material

Class 9 consists of material that may pose an unreasonable risk to health, safety, or property during transport but does not meet any of the definitions of the other hazard classes specified in this manual (fig. 2-9).

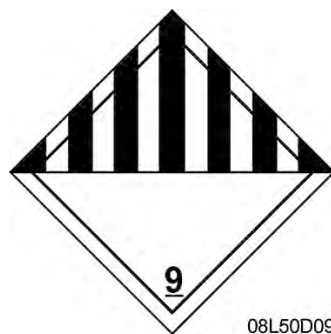


Figure 2-9. Class 9.

Other regulated materials-domestic

Other regulated materials-domestic (ORM-D) are only those materials that present a limited hazard during transportation due to their form, quantity, and packaging (e.g., consumer commodity). ORM-D classification is only authorized for domestic shipments. International shipments must not be transported under the classification "ORM-D" (fig. 2-10).



Figure 2-10. ORM-D.

Hazardous waste

Hazardous waste is any material that is subject to the hazardous waste manifest requirements of the Environmental Protection Agency (EPA) specified in 40 CFR 262 (fig. 2-11).

Figure 2-11. Hazardous waste.

Labeling

The shipper has a responsibility to label all cargo but even more so with hazardous cargo. Failure to properly label hazardous cargo could place many people's lives in danger. These hazardous labels (shown in figs. 2-1 through 2-11) are used to easily identify any shipments containing HAZMAT so people who work around them know which hazards are present. Shippers must apply the appropriate labels to the outer packaging of shipments using labels meeting certain color and specifications. They must not use labels that are easily confused by their use, shape, and color, with the standard labels prescribed. Some specifications for labels include the following:

- *Secondary hazards do not require labels.* A secondary hazard is a distinct and separate hazardous item that is a component or integral part of a larger item, considered the primary hazard.
- *Labels must be visible during transportation.* If hazard labels are not visible due to placement (located in the middle of an aircraft pallet, cargo bed covered by a tarp, within a freight container, etc.), apply required labels to a marking board placed to identify presence of each hazard classification.
- *Place both a primary hazard label and a subsidiary risk label (if applicable) to any item having one or more subsidiary risks.* A subsidiary risk is defined as an additional hazardous property of a material other than the primary hazard.
- When HAZMAT are palletized on a 463L or warehouse pallet, ensure the *label is clearly visible.*
- Position hazardous cargo loaded in the back of a vehicle so the labels are clearly visible, or apply the labels for each hazard to a clearly visible marker board to identify the presence of each hazard classification.

Shippers must also place any applicable handling labels on HAZMAT. Let's discuss some label examples.

"Cargo Aircraft Only" labels (fig. 2-12) are placed on packages not permitted on aircraft carrying passengers.

"Magnetized Material" labels (fig. 2-13) are placed on packages containing magnetized material. Magnetized material falls within hazard Class 9, but a Class 9 label is not required when the magnetized material label is used.

“Empty” labels (fig. 2-14) are placed on packages that once held a HAZMAT but have had any remaining hazardous residue purged from the container. Any container or cylinder shipped as empty must have the previously applied hazard labels removed, obliterated, destroyed, or completely covered by the “EMPTY” label.

“Keep Away From Heat” labels (fig. 2-15) are placed on packages containing self-reactive substances of Class/Division 4.1 or organic peroxides of Class/Division 5.2.



Figure 2-12. “Cargo Aircraft Only” label.



Figure 2-13. “Magnetized Material” label.

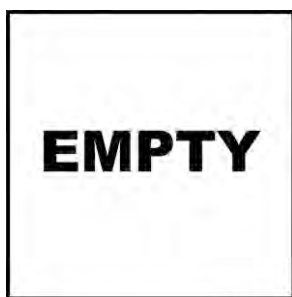


Figure 2-14. “Empty” label.



Figure 2-15. “Keep Away from Heat” label.

Marking

Shippers must mark HAZMAT according to MIL-STD 129 and AFMAN 24-204, Attachment 14. Labels may be used to meet marking requirements as long as they meet all application, placement, size, legibility, and durability requirements for marking. Just as with labels, markings should be visible as much as possible when shipments are loaded onto aircraft pallets and within vehicles and trailers to identify the hazards within. HAZMAT require specific markings according to the hazard class and other characteristics, some of which are outlined in the following paragraphs.

United Nations packaging specification markings

United Nations (UN) specification markings are mandatory for all packages of HAZMAT unless exempted by AFMAN 24-204 or a separate approval. Figure 2-16 shows two examples of what a UN package specification marking looks like.

Example of a Single or Combination Marking:

a b c d e f g h

u
n
4G / Y 7.4/ S /99/USA /DOD

- (a) The United Nations Symbol
 (b) Type of Packaging Code
 (c) Packing Group:

X = PG I, II and III
 Y = PG II and III
 Z = PG III Only

- (d) Maximum Gross Mass (In Kilograms)
 (e) Letter "S" , Solid or Inner Packagings
 (f) Year of Manufacture or assembly
 (g) State (Country) authorizing mark
 (h) Symbol of Manufacturer/Certifier

Example of marking for single packaging to contain liquid:

a b c d e f g h

u
n
1A1 / Y 1.3 / 95 /99 /USA / DOD

- (a) The United Nations Symbol
 (b) Type of Packaging Code
 (c) Packing Group:

X = PG I, II and III
 Y = PG II and III
 Z = PG III Only

- (d) Relative Density
 (Show if >1.2)
 (e) Test Pressure (in Kilopascals)
 PG I-not less than 250 kPa
 PG II & III-not less than 95 kPa
 (f) Year of Manufacture or assembly
 (g) State (Country) authorizing mark
 (h) Symbol of Manufacturer/Certifier

08L50D16

Figure 2-16. UN packaging specification marking.

Orientation marking, “This Side Up”

Orientation markings (fig. 2-17) are not required for single packaging when package orientation is obvious (e.g., drums, barrels, etc.) or on freight containers (an ISU, CONEX [container express], or military van or container [MILVAN]). The lettering “THIS SIDE UP,” “THIS END UP,” or “UP” may be used in conjunction with orientation markings.

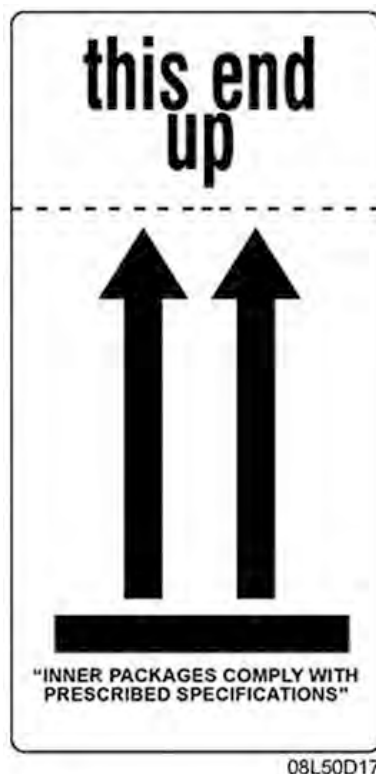


Figure 2-17. Orientation marking/label with “inner packages comply” statement.

Documentation

Documenting HAZMAT is important to help identify the material. To identify and certify HAZMAT shipments, the shipper completes the AMC Form 1033, Shipper’s Declaration for Dangerous Goods (SDDG), in three copies. Attach one copy to the manifest placed on the aircraft. File the second copy with the station file manifest. Place the third copy in a waterproof envelope and attach it to the number one piece of the shipment. All three copies must have the vertical red-hatch border and certifying official’s signature. The SDDG can be accomplished manually or mechanically (computer) or a combination of both, but all entries must be legible. Figure 2-18 shows an example of a completed SDDG.

True copies

There may be times when you discover there are not enough copies of the SDDG with the red-hatch border. This may occur when a hazardous shipment needs to be “split” to facilitate faster movement of a large shipment of HAZMAT on multiple aircraft or you simply run out. The transshipper or CSB/ACA may prepare a “True Copy” of the SDDG. Use the information in the signature block from the original form and annotate it on the true copy. On the reverse side of the form, type or clearly print the words “True Copy” and the name of the individual who is certifying the new SDDG to be a true copy. This individual must sign his or her name above the typed or printed name. This individual preparing the true copy does not need to be HAZMAT inspector or preparer qualified.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS						
SHIPPER TRAFFIC MANAGEMENT FLIGHT 5236 CHASE ST WRIGHT PATTERSON AFB OH 45433-5501 PHONE NUMBER: (793) 257-4409 DSN: 787-4409				AIR WAYBILL NO. PAGE 1 OF 1 PAGES SHIPPER'S REFERENCE NUMBER TCN: FB230061809001XXX		
CONSIGNEE FB5612 435 ABW LRS RAMSTEIN AB, GERMANY						
COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDLED TO THE OPERATOR				WARNING Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.		
TRANSPORTATION DETAILS THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE) <input type="checkbox"/> PASSENGER AND CARGO AIRCRAFT <input checked="" type="checkbox"/> HAZARDOUS MATERIALS				AIRPORT OF DEPARTURE: WRI MCGUIRE AFB, NJ		
AIRPORT OF DESTINATION: RAMSTEIN AB, GERMANY				SHIPMENT TYPE: (DELETE NON-APPLICABLE) <input type="checkbox"/> NON-RADIOACTIVE <input checked="" type="checkbox"/> RADIOACTIVE		
NATURE AND QUALITY OF DANGEROUS GOODS						
DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE OF PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN3166	ENGINES, INTERNAL COMBUSTION	9		1 DIESEL GENERATOR	A13.5	
ADDITIONAL HANDLING INFORMATION DIESEL FUEL, 3, 500 ML. BATTERY, WET FILLED WITH ACID, 8, 5 LITERS 1-804-279-3131 EMERGENCY TELEPHONE NUMBER: 1-800-851-8061						
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.				NAME/TITLE OF SIGNATORY Alex Lucette Warehouse Supervisor PLACE AND DATE WPAFB, OH, 45433 4 Jan 2012 SIGNATURE (see warning above) <i>Alex Lucette</i>		

AMC IMT 1033, 20050204, V1

Figure 2-18. Completed SDDG.

Inspecting HAZMAT

HAZMAT inspectors within AMC use AMC Form 1015 to perform a 100 percent *exterior inspection* of originating HAZMAT shipments and associated documentation for compliance with AFMAN 24-204 (IP) and other applicable directives. Inspectors also perform a random *interior inspection* of at least 10 percent of shipments not exempt from interior inspections. Inspectors have access to all cargo, to include containerized loads (CONEXs, MILVANs, tactical shelters, ISUs, etc.) unless the shipper has obtained an exemption in writing from HQ AMC. The AMC Form 1015 is used for single, multiple, loose, or palletized HAZMAT shipped under a single TCN. The form is not required for vehicles and rolling equipment when a DD Form 2133, Joint Airlift Inspection Record, is used for JIs. For this type of shipment, inspectors must still comply with the requirements of AFMAN 24-204. Inspectors will ensure that fuel gauges are operable or graduated dip-sticks are available; they will verify fuel in tank quantity, including verifying presence of additional fuel tanks, identifying any fuel leaks, and checking battery terminal post for protection against short circuits. They also verify fire extinguishers are secure and in approved holders.

If the vehicle/nonpowered equipment is nonhazardous and contains a secondary hazardous load, the form (1015) is still required for the secondary load. Figures 2-19a and 2-19b show an example of an AMC Form 1015. If you remember in the first unit, the AMC Form 33, Report of Frustrated Cargo, is used to frustrate cargo. That is not the case with HAZMAT. If discrepancies are noted with

HAZMAT shipments, inspectors use the AMC Form 1015 *instead* of the AMC Form 33 to *frustrate* the cargo.

HAZMAT INSPECTION AND ACCEPTANCE CHECKLIST		TCN	FB23009180X001XAX
INSPECTION VALIDATION			
THIS SHIPMENT HAS BEEN INSPECTED AND		<input type="checkbox"/> COMPLIES WITH ALL REGULATORY REQUIREMENTS	<input checked="" type="checkbox"/> DOES NOT COMPLY WITH ALL REGULATORY REQUIREMENTS AS INDICATED
DATE (YYYYMMDD)	INSPECTED BY (NAME)	DATE (YYYYMMDD)	CORRECTED BY (NAME)
20120403	Tamara Serrano	20120403	James Conner
DATE (YYYYMMDD)	RE-INSPECTED BY (NAME)	CORRECTIVE ACTIONS CHECKED. SHIPMENT COMPLIES WITH ALL REGULATORY REQUIREMENTS.	
20120404	Jim McHale		
ENTER "X" TO IDENTIFY NONCOMPLIANCE. USE COMMENTS BLOCK TO PROVIDE ADDITIONAL DETAILS. CIRCLE "X" WHEN CORRECTIVE ACTION IS COMPLETED. SIGN INSPECTION VALIDATION BLOCK AND ATTACH TO SHIPPER'S DECLARATION FILED WITH STATION MANIFEST. THOSE ITEMS THAT APPLY ONLY TO RADIOACTIVE MATERIAL ARE IDENTIFIED BY AN "R." ADDITIONAL CHECKPOINTS ON THE REVERSE.			
SHIPPER'S DECLARATION		CARGO IDENTIFICATION (IF APPLICABLE) (CONTINUED)	
1. THREE ORIGINAL DOCUMENTS FOR EACH PROPER SHIPPING NAME (PSN) UNDER A SINGLE TCN (ONLY TWO REQUIRED FOR CHAPTER 2)		33. DRYGENIC VENTING REQUIREMENTS	
2. SHIPPER'S ADDRESS AND PHONE NUMBER		34. SECONDARY HAZARD PSN, CLASS OR DIVISION AND NET QUANTITY	
3. CONSIGNEE ADDRESS OR ADDRESS (OR WORK/WORKING ADDRESS)		35. HANDLING INSTRUCTIONS	
4. TRANSPORTATION CONTROL NUMBER (TCN)		36. OTHER	
5. AIRPORT OF DEPARTURE AND DESTINATION (OR WORK/WORKING ADDRESS)		PACKAGING—OUTER	
6. NAME AND TITLE OF PREPARER WITH SIGNATURE		37. CONTAINER SERVICEABLE, DAMAGE, LEAKAGE OR LOSS CONTENTS	
7. PLACE AND DATE MATERIAL CERTIFIED		38. APPROVED OUTER CONTAINER (IF REQUIRED)	
8. PEN AND INK CHANGES SIGNED		39. PACKAGE PERMITTED BY PACKAGING REFERENCE	
9. EMERGENCY RESPONSE NUMBER		40. OTHER	
10. OTHER		IF APPLICABLE	
CARGO IDENTIFICATION (NATURE & QUANTITY OF HAZMAT)		41. ULLAGE	
11. IDENTIFIES WHETHER PACKED WITHIN PASSENGER OR CARGO AIRCRAFT ONLY		42. UN SPECIFICATION OR POP CONTAINER MATCHES CORRESPONDING PACKING GROUP	
12. IDENTIFIES RADIOACTIVE OR NONRADIOACTIVE SHIPMENT		43. GROSS WEIGHT OF PACKAGE IS EQUAL TO OR LESS THAN TESTED WEIGHT INDICATED AS PART OF POP MARKING	
13. IDENTIFICATION NUMBER (UN 30, NA)		44. SINGLE PACKAGE (CONTAINING A LIQUID) TESTED PRESSURE (KPA) AGREES WITH CONTAINER REQUIREMENTS	
14. PSN (WITH TECHNICAL NAME IF REQUIRED)		45. OTHER	
15. PRIMARY HAZARD CLASS OR DIVISION (COMPATIBILITY GROUP FOR EXPLOSIVES)		PACKAGING—INNER (IF INSPECTED AND APPLICABLE)	
16. SUBSIDIARY RISK CLASS OR DIVISION IF ASSIGNED		46. ABSORBENT MATERIAL	
17. PACKAGING GROUP		47. LEAK OR ACID PROOF LINER	
18. NUMBER AND TYPE OF PACKAGES		48. INNER RECEPTACLE ORIENTATION	
19. NET QUANTITY PER PACKAGE (ACFIC UNLESS EXCEPTED)		49. SECONDARY CLOSURE	
20. R-ACTIVITY PER PACKAGE GIVEN IN DEQUEL SYSTEM		50. OTHER	
21. R-NAME AND SYMBOL OF MATERIAL		MARKING	
22. R-MATERIAL PHYSICAL AND CHEMICAL FORM		51. PSN AND IDENTIFICATION NUMBER	
23. PACKAGING PARAGRAPH (FROM ATTACHMENTS 5-13)		IF APPLICABLE	
A. "A1.2.3" USED WHEN POP TESTED PACKAGE IS OVERPACKED TO MEET ALL REQUIREMENTS		52. UN OR POP SPECIFICATION MARKING	
B. PACKAGING REFERENCE FROM ATTACHMENT 27 USED FOR EXPLOSIVES MEETING GRANDFATHER CLAUSE		53. "HGP"	
C. UNPACKAGED EXPLOSIVES AUTHORIZED FOR "A1.2.3"		54. "WASTE"	
24. DOT-E, COE, CAA OR OTHER APPROVED DOCUMENT USED AS CERTIFICATION REFERENCE (COPY ACCOMPANIES SHIPMENT)		55. "HARLEQUIN" MARKING OR SYMBOL	
25. ABOFT, UTA OR ICAO REFERENCE USED AS CERTIFICATION REFERENCE (IF MEETING PASSENGER RESTRICTIONS)		56. "OVERPACK" IDENTIFIED	
26. R-CATEGORY OF RADIOACTIVE PACKAGE		57. "ORIENTATION ARROWS"	
27. R-TRANSPORT INDEX		58. LIMITED QUANTITY IDENTIFIED	
IF APPLICABLE		59. "ORM-D" OR "ORM-E" FOR DOMESTIC ONLY SHIPMENT	
28. "NOT" IDENTIFIES A PSN AS HAZARDOUS SUBSTANCE		60. "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS"	
29. "WASTE" IF MARKED OR LABELED ON PACKAGE		61. DOT SPECIAL PERMIT (WHEN USED AS CERTIFICATION REFERENCE)	
30. "IMMEDIATELY HAZARDOUS (IDH)" (IF MATERIAL MEETS THIS DEFINITION)		62. COE NUMBER (WHEN USED AS CERTIFICATION REFERENCE)	
31. IF OVERPACKED, THE WORDS "OVERPACK USED"		63. CAA NUMBER (IF REQUIRED BY CAA)	
32. "LIMITED QUANTITY" OR "LTD QTY"		64. FLASHPOINT (IF AVAILABLE) (EXPLAN)	
		65. PSN (OR PART NUMBER) FOR EXPLOSIVES	
		66. OTHER	

AMC FORM 1015, 20070106

Figure 2-19a. AMC Form 1015 (front).

ENTER "X" TO IDENTIFY NONCOMPLIANCE. USE COMMENTS BLOCK TO PROVIDE ADDITIONAL DETAILS. CIRCLE "X" WHEN CORRECTIVE ACTION IS COMPLETED. SIGN INSPECTION VALIDATION BLOCK AND ATTACH TO SHIPPER'S DECLARATION FILED WITH STATION MANIFEST.					
THOSE ITEMS THAT APPLY ONLY TO RADIOACTIVE MATERIAL ARE IDENTIFIED BY AN "R."					
LABELING					
<input type="checkbox"/>	60. PRIMARY RISK LABEL				
<input type="checkbox"/>	70. R-RADIOACTIVE MATERIAL LABELS ON OPPOSITE SIDES OF PACKAGE				
IF APPLICABLE					
<input type="checkbox"/>	71. SUBSIDIARY RISK LABELS				
<input type="checkbox"/>	72. "CARGO AIRCRAFT ONLY" (NOT MANDATORY FOR MOBILITY OPERATIONS)				
<input type="checkbox"/>	73. "MAGNETIZED MATERIAL"				
<input type="checkbox"/>	74. "EMPTY"				
<input type="checkbox"/>	75. OTHER				
VEHICLES AND EQUIPMENT					
USE DO FORM 2133 AS CHECKLIST FOR DEPLOYMENT OPERATIONS(OTR,PAR700)					
<input type="checkbox"/>	76. FUEL GAUGE OPERATIVE OR DIP STICK AVAILABLE				
<input type="checkbox"/>	77. VEHICLES AND SELF-PROPELLED EQUIPMENT WITH FUEL QTY NOT EXCEEDING 1/2 TANK CAPACITY				
<input type="checkbox"/>	78. SUPPORT EQUIPMENT DRAINED				
<input type="checkbox"/>	79. NO EXISTING FUEL LEAKS				
<input type="checkbox"/>	80. ALL ADDITIONAL HAZARDS IDENTIFIED (SEE BLOCK 36)				
<input type="checkbox"/>	81. SECONDARY LOADS CERTIFIED, PACKAGED AND MARKED				
<input type="checkbox"/>	82. BULK FLAMMABLE LIQUID FUEL TANKS DRAINED OR PURGED AS REQUIRED				
<input type="checkbox"/>	83. SPARE FUEL IN AUTHORIZED CONTAINERS				
<input type="checkbox"/>	84. BATTERY POETS PROTECTED				
<input type="checkbox"/>	85. FIRE EXTINGUISHERS IN APPROVED HOLDER				
<input type="checkbox"/>	86. OTHER				
87. COMMENTS/REASON(S) FOR FRUSTRATION 59. Orientation arrows are going in opposite directions. 66. Shipping container not marked with the flash point.					
OPENED FOR INSPECTION: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; padding: 5px;">OPTIONAL USE</th> </tr> <tr> <td style="padding: 5px;">87. PCS: 1</td> </tr> <tr> <td style="padding: 5px;">88. WT: 24</td> </tr> <tr> <td style="padding: 5px;">89. CUBE: 3</td> </tr> </table>		OPTIONAL USE	87. PCS: 1	88. WT: 24	89. CUBE: 3
OPTIONAL USE					
87. PCS: 1					
88. WT: 24					
89. CUBE: 3					

AMC FORM 1015, 20070108 (REVERSE)

08L50D19

Figure 2-19b. AMC Form 1015 (back).

General handling requirements

Follow safe practices when handling, stacking, loading, positioning, and restraining hazardous cargo. Only personnel trained and qualified may handle, load, or offload HAZMAT. Protective clothing and/or spill-control kits are available where HAZMAT are normally handled or stored. Store the kits in a manner that allows terminal personnel immediate access to their contents, and inspect kits monthly to ensure completeness and serviceability.

Only trained personnel under the supervision of an individual who understands the hazards and risks involved in the operation are to handle explosives. Do not use bale hooks to handle explosives or tumble, drag, drop, throw, roll, or “walk” munitions. Containers designed with skids may be pushed or pulled for positioning. Unless otherwise directed by the fire chief, provide a *minimum* of two serviceable fire extinguishers, suitable for the hazards involved, for immediate use at any location where explosives are being handled.

214. Determine compatibility and storage

We must consider many things, including compatibility, transporting, loading, and unique procedures applicable to certain items. Much of this lesson focuses on explosives, since they are such a great hazard, but it is important to remember that other HAZMAT should be handled with just as much caution and care.

Compatibility

Packages containing HAZMAT that might react dangerously with one another must not be loaded or transported in a position that would allow interaction between materials in the event of leakage. Attachment 18 of AFMAN 24-204 identifies segregation requirements for HAZMAT on military aircraft, including compatibility requirements for tactical and contingency operations under the authority of Chapter 3. Only the primary hazard class or division is considered for segregation. Subsidiary risks and secondary hazards are not used to determine segregation requirements. Figure 2-20 outlines the compatibility restrictions for all hazardous cargo, and figure 2-21 outlines more specific requirements for explosives according to their compatibility groups.

The two figures contain various symbols and notes to distinguish between those items that can be loaded, stored, and transported together and those that cannot. You are not required to memorize each and every requirement for compatibility, but you do need to have a general idea of compatibility restrictions, where to find the restrictions, and how to read the figures/tables within Attachment 18 of AFMAN 24-204. Let's go over how to read the figures.

The letter “X” at an intersection of horizontal and vertical columns indicates that these articles *must not be loaded, transported, or stored together*. For example, in figure 2-20, Class 3 flammable liquids must not be loaded, transported, or stored with Class 1.1. In figure 2-21, Class 1.2C must not be loaded, stored, or transported with Class 1.2H.

The letter “O” at an intersection of horizontal and vertical columns indicates that these articles *must not be loaded, transported, or stored together unless separated by a distance of 88 inches (2.2 meters [m]) in all directions*. For example, in figure 2-20, Class 8 corrosive liquids must not be loaded, transported, or stored with Class 4.1 flammable solids unless separated by 88 inches in all directions.

The “*” at an intersection of horizontal and vertical columns indicates that you will need to use figure 2-21 to *determine compatibility restrictions among different Class 1 materials*.

If the hazard classes you are looking for are not located on the table or there is a blank space in the table, it means that there are *no restrictions* for those items.

You may also notice in figure 2-20 that the first and second rows and columns have the word “notes” with numbers in certain blocks. If one of these numbered notes appears below or next to one or more

of the hazard classes you are looking for, this means that there are some special considerations or exceptions you must follow. The notes are listed by number at the bottom of each figure.

Table A18.1. Segregation Table for Hazardous Materials.

Class or Division Note 7 Note 10	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 Gas Zone A	2.3 Gas Other than Zone A	3	4.1	4.2	4.3	5.1	5.2	6.1 Liquid PG I Zone A	7	8 Liquid Only
Notes		1 6					9								1		4	2 3	4, 5 6, 7, 8
1.1 and 1.2	1 6	*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	X	X
1.3		*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	0	X
1.4		*	*	*	*	*	0		0	0	0		0				0		0
1.5		*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
1.6		*	*	*	*	*													
2.1	9	X	X	0	X				X	0			0	0	0	0	0	0	0
2.2					X														
2.3 Zone A		X	X	0	X		X				X	X	X	X	X	X			X
2.3 Other than Zone A		X	X	0	X		0				0	0	0	0	0	0			0
3		X	X	0	X				X	0		0	0	0	0	0	X		
4.1		X	X		X				X	0	0						X		0
4.2		X	X	0	X		0		X	0	0						X		X
4.3		X	X		X		0		X	0	0						X		0
5.1	1	X	X		X		0		X	0	0						X		0
5.2		X	X		X		0		X	0	0						X		0
6.1 Liquid PG I Zone A	4	X	X	0	X		0				X	X	X	X	X	X			X
7	2 3	X	0		X		0												
8 Liquid Only	4 5 6 7 8	X	X	0	X		0		X	0		0	X	0	0	0	X		

08L50D20

Figure 2-20. Compatibility table for HAZMAT.

NOTES (for fig. 2-20):

1. Ammonium nitrate fertilizer may be loaded, transported, or stored with Class 1.1 or 1.5 materials.
2. Do not load, transport, or store fissile Class III radioactive material (Class 7) on the same aircraft with any other HAZMAT.
3. Normal uranium, depleted uranium, and thorium metal in solid form radioactive materials (Class 7) may be loaded and transported with Class 1.1, 1.2, and 1.5 (explosives).
4. Do not load, transport, or store cyanides or cyanide mixtures (Class 6.1) with any Class 8 materials.
5. Separate nitric acid (Class 8) in carboys by 2.2 m (88 inches) in all directions from other corrosive materials in carboys when loaded on the same aircraft.

6. Do not load, transport, or store charged-electric storage batteries (Class 8) on the same aircraft with any Class 1.1 or 1.2.
7. Ship the following materials with each other and with all other HAZMAT without compatibility restrictions (ensure compliance with notes 4, 5, and 6):
 - 7.1. Class 6.1 toxic solids and liquids (other than PG I, zone A). See note 4 concerning restrictions for cyanides or cyanide mixtures.
 - 7.2. Class 8 solids.
 - 7.3. Class 9 (including ORM-D).
 - 7.4. Excepted quantities.
 - 7.5. Containers or articles drained but not purged containing 500 milliliters (ml) or 17 ounces (oz) or less of Class 3.
8. Class 8 corrosive liquids must not be loaded above or adjacent to Class 4 (flammable solid) material or Class 5 (oxidizing) material.
9. Class 2.1 aerosol cans may be shipped with other incompatible items when separated in all directions by a minimum of 88 inches.
10. Items classified by a predominate hazard other than Class 1, but contain small amounts of explosive materials and assigned an explosive compatibility letter for storage, may be shipped with Class 1 material according to figure 2-21. For example Class 4.2G may be shipped with Class 1.3G.

Table A18.2. Compatibility Table for Class 1 (Explosive) Materials.

Compatibility Group	A	B	C	D	E	F	G	H	J	K	L	N	S
NOTES													
A		X	X	X	X	X	X	X	X	X	X	X	X
B 1, 2,	X		X	X	X	X	X	X	X	X	X	X	
C	X	X				X	X	X	X	X	X		
D	X	X				X	X	X	X	X	X		
E	X	X				X	X	X	X	X	X		
F 3	X	X	X	X	X		X	X	X	X	X	X	
G 4, 5, 7	X	X	X	X	X	X		X	X	X	X	X	
H	X	X	X	X	X	X	X		X	X	X	X	
J	X	X	X	X	X	X	X	X		X	X	X	
K	X	X	X	X	X	X	X	X	X		X	X	
L 6	X	X	X	X	X	X	X	X	X	X		X	X
N	X	X				X	X	X	X	X	X		
S 7	X										X		

08L50D21

Figure 2-21. Compatibility table for Class 1 (explosive) materials.

NOTES (for fig. 2-21):

1. Group "B" explosives UN 0255, UN 0257, UN 0267, and UN 0361 may be loaded and transported with groups "C," "D," and "E" explosives.
2. Group "B" explosives packaged in an EOD Mark series (MK) 663 modified platform (MOD) O container may be loaded and transported with groups "C" through "H" and group "S" explosives.

3. Group “F” explosives UN 0292 may be loaded and transported with groups “C,” “D,” and “E” explosives.
4. Group “G” explosives UN 0019, UN 0300, UN 0301, and UN 0325 may be loaded and transported with all other explosives compatible with group “S” explosives.
5. Group “G” explosives UN 0009, UN 0018, UN 0314, UN 0315, UN 0317, UN 0319, and UN 0320 may be transported with groups “C,” “D,” and “E” explosives.
6. Group “L” explosives must only be loaded and transported with an identical item.
7. Class 1.1 and 1.2 explosives may not be shipped with UN 0333, UN 0334, UN 0335, UN 0336, and UN 0337.

The only time you can deviate from the requirements of Attachment 18 is when an aircraft or mission is authorized to operate under Chapter 3 provisions. Under Chapter 3 normally incompatible HAZMAT may be transported on the same aircraft when separated to the *maximum extent possible*. Compatibility waivers are not required. Even then, certain restrictions are still mandatory:

- Explosives in compatibility groups A, J, K, and L can only be shipped with material in compatibility Group S and Class 9.
- Fissile Class III radioactive materials (Class 7) cannot be loaded, transported, or stored on the same aircraft with any other HAZMAT.
- Class 1.1, 1.2, and 1.3 cannot be shipped with any inhalation-hazard zone A material.
- Class 1.1, 1.2, and 1.3 cannot be shipped with Class 6.1 poisonous liquids, PG I.
- Cyanides or cyanide mixtures (Class 6.1) cannot be loaded, transported, or stored with any corrosive Class 8 material.

In other words, Chapter 3 is *not* a “free-for-all.” Safety is still and will *always* be paramount.

So, what’s the point with all this information? If you are handling, storing, transporting, or loading multiple shipments of HAZMAT, make sure they can be near each other by looking them up in Attachment 18. If not, separate them or remove them from the area to ensure the safety of everyone and everything around you.

Storage

Conveniently, each air terminal has established a storage location system for both palletized cargo and loose shipments to help with compatibility restrictions and movement efficiency. AMCI 24–101, Volume 11, outlines the standardized locations for each type of cargo. The locations depend on the design of your local facility, the amount of cargo you have each day, and the amount of storage space you have at your facility. The hazardous cargo area will be identified by placards with the words “HAZARDOUS—NO SMOKING.” Placards marked with the hazardous cargo classification and a copy of the appropriate HAZMAT warning label will identify individual bays within the hazardous cargo area. The following table is an excerpt from Volume 11:

Pallet Areas		
	General cargo/mail.	Areas 1 through 7 (i.e.; 4B12)
	Security/signature service materials.	Area 8 (i.e.; 8A01)
	HAZMAT.	Area 9 (i.e.; 9A01)
Bay Locations		
	Security/signature service.	Bays 01–04
	Shipments requiring refrigeration.	Bays 05–08
	Forward supply system (FSS)/MICAP/VVIP shipments not requiring special handling.	Bays 09–10
	Explosives (Class 1.1 through 1.6).	Bays 11–17
	RESERVED FOR FUTURE USE.	Bays 18–21

Bay Locations		
	Compressed gases (Class 2).	Bay 22
	Flammable liquids (Class 3).	Bay 23
	Flammable solids (Class 4).	Bay 24
	Oxidizing substances (Class 5).	Bay 25
	Poisonous liquids and infectious substances (Class 6).	Bay 26
	Radioactive materials (Class 7).	Bay 27
	Corrosives (Class 8).	Bay 28
	Miscellaneous dangerous goods (Class 9).	Bay 29
	Oversized/outsized loose hazardous cargo.	Bay 30
Other Shipment Categories		
	Loose cargo/ordinary mail shipments.	Bays 31–90
	Oversized/outsized loose general cargo.	Bays 91–95
Frustrated Shipments		
	General cargo.	Bay 96
	Oversized/outsized cargo.	Bay 97
	Refrigerated cargo.	Bay 98
	Security cargo.	Bay 99

215. Placarding

Identifying HAZMAT means more than just marking, labeling, and documenting the shipment. You must also let those around you know when you are working with HAZMAT. We do this by placarding transport vehicles and areas surrounding aircraft. Attachment 16 in AFMAN 24–204 covers area placarding and AFMAN 91–201, *Explosives Safety Standards*, covers placarding vehicles. Let's talk about vehicle placarding first.

Placarding vehicles

Placarding vehicles is important to identify that you are carrying cargo that requires extra care and caution. Use Department of Transportation (DOT) placards as outlined in 49 CFR to placard vehicles carrying explosives. Commanders may omit placards on base where necessary to avoid attention of hostile forces. When transporting explosives off the installation in a foreign country, you must comply with host nation requirements. Placards may be omitted for Hazard Class and Division (HC/D) 1.4 material on base. *Compatibility group letters may be omitted from the placard if the vehicle remains on the installation.*

Where tow vehicle and trailer combinations are used on base, placard the lead vehicle on the front and the last vehicle on the rear. Placard loaded vehicles in between on each side. Placard MHE only when used in the same manner as a transport vehicle or trailer.

Placarding aircraft

The area surrounding any aircraft transporting any HAZMAT must be placarded as well to let emergency response and other personnel know of HAZMAT and explosives presence. Use placards that meet the general design, size, and color specifications of 49 CFR. For explosives, fire and chemical hazard symbols specified in DOD 6055.9–STD may be used in place of placards. Display placards prominently at the front, rear, and both sides of the aircraft *unless* emergency response access is restricted. Then post placards at entry points. Ensure the placards are facing away from the aircraft, not towards the aircraft.

Park aircraft transporting Class 1.1, 1.2, and 1.3 explosives and any material identified as inhalation-hazard zone A in a remote area. Placarding is still required for these materials when parked in a designated restricted, posted, and traffic-controlled parking or loading and unloading area. Park

aircraft transporting all other types of HAZMAT in a placarded area. However, placarding is not required for these materials when parked in a designated restricted, posted, and traffic-controlled parking or loading and unloading area.

Military hosts are responsible for placarding at military bases. At nonmilitary airfields, the agency delivering cargo to the aircraft, or offloading cargo, is responsible for making arrangements with the airport manager for identifying the cargo, isolating parking and loading, placarding, firefighting, and disaster response. Activities having operational control of the aircraft will make arrangements for using en route nonmilitary airfields.

To figure out what and when to placard, the *first step* is to know what the hazard class is and its aggregate gross weight. The following tables, found in AFMAN 24-204, outline which type and quantity of materials require placards.

Hazard Class or Division (Any Quantity)	Type of Placard
1.1	EXPLOSIVES 1.1
1.2	EXPLOSIVES 1.2
1.3	EXPLOSIVES 1.3
2.3	TOXIC GAS
4.3	DANGEROUS WHEN WET
5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
6.1 (Inhalation-hazard zone A or B)	TOXIC INHALATION HAZARD
7 (Radioactive category III-Yellow label only)	RADIOACTIVE

Hazard Class or Division (1,001 lbs. Or More Aggregate Gross Weight)	Type of Placard
1.4	EXPLOSIVES 1.4
1.5	EXPLOSIVES 1.5
1.6	EXPLOSIVES 1.6
2.1	FLAMMABLE GAS
2.2	NONFLAMMABLE GAS
3	FLAMMABLE
4.1	FLAMMABLE SOLID
4.2	SPONTANEOUSLY COMBUSTIBLE
5.1	OXIDIZER
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
6.1	TOXIC
6.2	NONE REQUIRED
8	CORROSIVE

Notice in the first table, *ANY AMOUNT* of the materials listed requires a placard. In the second table, *only materials that have an aggregate (combined) gross weight of 1,001 lbs. or more require a placard*. So the *second step* is to add your HAZMAT weights together to get the aggregate gross weight.

You may ask what happens when loads contain more than one type of HAZMAT. For explosives, *use the explosive placard representing the highest hazard*. For example, if the area contains both class 1.1 and 1.2, use the explosive 1.1 placard.

When loads contain two or more hazardous articles (other than explosives 1.1, 1.2, and 1.3), combine the gross weight and quantity to determine placarding requirements. The quantity limitation will be the total gross weight of the packages comprising the shipment or different shipments of the same classification.

For those hazard classes located in the second table, placarding is not required if the aggregate gross weight of the packages of those classes is less than 1,001 lbs. (454 kilograms [kg]). A “DANGEROUS” placard may be used in place of the separate placards for two or more categories. When 2,205 lbs. (1,000 kg) or more of one category of material from the lower portion of the table is loaded, the specific placard for that material is required, and a “DANGEROUS” placard may not be used to represent that material.

The *last step* is to placard the aircraft and surrounding areas as described in the beginning of this lesson. This will ensure everyone around you knows you are working with HAZMAT.

216. Transporting hazardous/explosive material

Always consider vehicle and handling equipment type, type of load, prevailing weather, and surface conditions when determining if safe movement is possible. Refuel vehicles *before* transporting explosives. Do not use forklifts to transport explosives in over-the-road-type operations or out of the immediate work area.

Vehicle inspection

It is always important to inspect your vehicle before you operate it, and it is especially important before transporting explosives. Ensure vehicles are inspected and equipment operators are trained to transport and handle explosives IAW AFMAN 91–201. During inspection, ensure each explosives-laden vehicle used for transport has at *least two* appropriately rated fire extinguishers properly charged and in good working order. You must also ensure the following:

- Gas caps are in place.
- Electric wiring is in good condition and properly attached.
- Chassis, motor, pan, and underside of body are reasonably free of oil, grease, and fuel.
- Fuel tank and feed lines are secure and not leaking.
- Brakes, steering, lights, horn, and windshield wipers are functioning properly.
- Tires are properly inflated and free of defects.

Restraining cargo (general purpose vehicles)

Do not operate vehicles containing explosives until the cargo has been checked to ensure safe transportation. For on-base movements, explosives containers must be restrained, blocked, braced, tied down, or otherwise secured to the vehicle to prevent movement and must not damage explosives or containers. Positively secure stacked pallets, skids, or containers of explosives on any transport vehicle prior to movement. Restraining devices may include chains and binders, cargo nets and tie-down straps, sideboards and tailgates, and so forth; they must be used IAW applicable TOs. Do not transport explosives in a passenger compartment of a vehicle unless exempt by AFMAN 91–201.

Forklift restraint

Pallets, skids, or individual containers of explosives will be secured to forklifts to prevent dropping. Explosives need not be secured to a forklift when the pallet, skid, or container has built-in tie enclosures or for specific operations identified in local operating instructions that present a minimum hazard of damage during handling.

Operation (general purpose vehicles)

Do not leave explosives-laden vehicles unattended unless they are parked in a properly designated area, such as the weapons storage area, holding yard, or flight-line munitions holding area. Chock explosives-loaded vehicles and trailers parked on any grade or ramp steep enough to cause the vehicle to roll. Do not smoke in, on, or within 50 feet of any motor vehicle, trailer, rail car, or MHE loaded with explosives items.

Do not load or unload explosives from a motor vehicle while the engine is running, except under the following conditions:

- Where the engine is required to provide power to vehicle mechanical handling equipment used in loading and unloading the vehicle.
- Where necessary for emergency operations or timing for exercises simulating execution of emergency plans. In this case, small loads or packages of explosives delivered to aircraft, requiring only momentary unloading time, may be removed from a vehicle while the motor is running.
- Engines of diesel-powered vehicles may continue to run during loading or unloading of explosives except when exposed explosives are involved.
- Adequate ventilation is provided to prevent unnecessary build up of exhaust gases.
- The vehicle is kept at the aircraft or storage location no longer than needed to complete explosives loading or unloading. If a delay occurs, move vehicle from location.
- Parking brakes are set and the operator remains in the driver's position or sets brakes, chocks wheels, and remains close to the vehicle.
- Where the vehicle was designed and built for these operations, refer to drivers manuals for accepted procedures.

Forklift operation

Ensure forklifts use skids or pallets to move containers of explosives, except when containers are designed with fully enclosed stirrups (360°) for forklift tines. Munitions may be carried on forklift tines when the weapon body is long enough to be firmly supported on both tines and strong enough to prevent damage.

Loading HAZMAT and explosives

HAZMAT are not transported on aeromedical evacuation (AE) missions *except* for those materials that can be transported safely without degrading healthcare; however, shipping these materials must still be approved by the local AE representative.

Load all HAZMAT aboard the aircraft so the loadmaster/boom operator has easy access in-flight. Position hazardous cargo that is considered jettisonable aft of nonjettisonable cargo (e.g., rolling stock, pallet trains, etc.) except when its size, weight, and location permits jettisoning by hand. Adhere to the following *safety precautions* when loading hazardous cargo:

- Proper ventilation.
- Aircraft placarding.
- No smoking.
- Fire extinguisher availability.
- Thorough inspection of cargo.
- Stowage away from heater outlets and other heat or electrical sources.
- Medical personnel notified if radioactive material is damaged.
- Use of protective clothing and equipment as required when handling HAZMAT.
- Aircraft electrical grounding (when required IAW TO 00-25-172).

Grounding aircraft

Aircraft is grounded *during explosives operations* to reduce electrostatic discharge. If there are unusual parking problems in operating from "bare" and "limited" bases, nonmilitary airfields, host nation airfields, and so forth, use the best alternate method of reducing the hazard. If feasible, the aircraft and the vehicle or handling equipment used in loading and unloading will be connected

(bonded) together with an approved *static ground* capable of equalizing the electrical potential between the two. For example, although it is considered feasible to bond a cargo vehicle to the aircraft, it may not be feasible to bond an aircraft to a forklift if the lift must move during the loading operation.

During explosives loading/unloading operations, personnel must be particularly careful to *discharge themselves or to equalize their static electrical potential* with that of the aircraft, vehicle, handling equipment.

Venting

All cryogenic liquid storage and transfer tanks (unless exempt by AFMAN 24-204) must be vented overboard the transport aircraft. The shipper is responsible for providing specific venting instructions in the SDDG and for providing the equipment needed to vent the container overboard. Preparation and hookup/disconnection of the vent system is accomplished by qualified shipper or aircraft maintenance personnel IAW the applicable TO. ATOC prearranges for a qualified person to make the hookup at the desired time during loading operations. Air terminal personnel and aircraft loadmaster/boom operators are not qualified to make the hookup or disconnection.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

213. Hazardous materials and explosives

1. What is the cardinal principle of explosives safety?
2. Match each HAZMAT qualification and role in column B with its description in column A. Items in column B can be used once, more than once, or not at all. Item numbers can have more than one correct answer.

Column A

- ____ (1) Do not sign any legally-binding documents, but package HAZMAT.
- ____ (2) Come into contact with HAZMAT, but do not package, inspect, or certify.
- ____ (3) Certify, by signing legally-binding documents, that any HAZMAT is properly classified, packaged, marked, labeled, and in proper condition for transportation.
- ____ (4) Include warehouse workers, aircraft load teams, pallet build-up personnel, and others.
- ____ (5) Complete and sign the AMC Form 1015.
- ____ (6) Authorized to certify specific items they are technically qualified to maintain and prepare for shipment.
- ____ (7) Issue passenger deviations, load plan HAZMAT shipments, and sign hazardous-brief sheets.
- ____ (8) Conduct JIs.

Column B

- a. Handler.
- b. Inspector.
- c. Packer.
- d. Preparer.
- e. Technical specialist.

3. Match each hazard class in column B with its description in column A. Items can be used once, more than once or not at all.

Column A

- ____ (1) Flammable liquid.
- ____ (2) Poisonous (toxic) material and infectious substances.
- ____ (3) Miscellaneous HAZMAT.
- ____ (4) Explosives.
- ____ (5) Corrosive materials.
- ____ (6) Flammable, nonflammable, and poisonous gases.
- ____ (7) Radioactive materials.

Column B

- a. Class 1.
- b. Class 2.
- c. Class 3.
- d. Class 4.
- e. Class 5.
- f. Class 6.
- g. Class 7.
- h. Class 8.
- i. Class 9.

4. What is a secondary hazard?
5. When HAZMAT are placed on a 463L pallet or in the back of a vehicle, what are your two options for ensuring the labels are clearly visible?
6. Which type of marking is required for all HAZMAT unless exempted by AFMAN 24-204 or a separate approval?
7. Which document does the shipper complete to certify HAZMAT; how many copies are prepared?
8. Who can prepare a "True Copy" of the SDDG?
9. Which document do aerial port personnel use to inspect and frustrate a HAZMAT shipment?
10. What *must* be available for use and inspected monthly where HAZMAT are normally handled or stored?
11. Concerning explosives, how may you *not* handle them?

214. Determine compatibility and storage

1. Of the primary, secondary, and subsidiary hazard classes, which one(s) is used to determine compatibility?
2. What part of the explosives classification number is used to determine compatibility for explosives?
3. On the compatibility tables in AFMAN 24-204, Attachment 18, what does the letter “X” signify?
4. On the compatibility tables in AFMAN 24-204, Attachment 18, what does the letter “O” signify?
5. On the compatibility tables in AFMAN 24-204, Attachment 18, what does a blank space signify?
6. If there are special considerations or exceptions for a given HAZMAT on the compatibility tables, how is it identified?
7. When can you deviate from the compatibility requirements of Attachment 18?

215. Placarding

1. Where and how should placards be displayed on an aircraft?
2. Placarding aircraft areas depends on the type of HAZMAT and quantity. Match each quantity of HAZMAT in column B with the appropriate hazard class for placarding in column A. Items in column B can be used once, more than once, or not at all.

Column A

- ____ (1) Class 1.1.
- ____ (2) Class 1.3.
- ____ (3) Class 1.4.
- ____ (4) Class 2.1.
- ____ (5) Class 2.2.
- ____ (6) Class 3.
- ____ (7) Class 8.

Column B

- a. Any quantity.
- b. 1,001 lbs. or more aggregate gross weight.

216. Transporting hazardous/explosive materials

1. What four things must you do before transporting an explosives shipment?
2. What must you do to prevent explosives-laden vehicles from rolling?
3. How is hazardous cargo loaded on the aircraft?
4. You must be particularly careful to do what during explosives loading/unloading operations?
5. Who is responsible for hooking up and disconnecting the vent system for cryogenic liquid storage and transfer tanks?

2-2. Special Cargo

Special cargo is cargo which requires any special handling involving acceptance, air movement, environmental control, handling, packaging, security, or any combination of these factors.

217. Process classified shipments

It is the shipper's responsibility to notify the air terminal when a shipment is classified, the degree of classification, if it requires security protection, and whether it is hazardous. Provide signature service for the following types of shipments:

1. Material classified SECRET or CONFIDENTIAL.
2. Sensitive shipments.
3. Others requiring special handling in exceptional cases.
4. Biologicals and blood of such urgency that human life depends upon immediate receipt.
5. HR.
6. Money or gold bullion.

These shipments are airlifted under the care of a crew member on military missions and tendered to the contractor for Transportation Protective Service (TPS) handling on contract commercial missions. All air terminal representatives who receipt for classified shipments must possess a security clearance equal to or higher than the highest classification of the affected shipment and are identified on a local authorization letter. Aircrew member security clearance appears in the flight orders.

Alternatively, when appropriate, these shipments may be moved under the care of an authorized escort/courier on military and/or contract missions. If a courier is not provided by the shipper, couriers will be selected by ATOC, who will coordinate with Passenger Service IAW AMCI 24-101 V. 9.

DD Form 1387-2, Special Handling Data/Certification

When shippers ship a security or classified shipment, they mark the shipments IAW MIL-STD 129, but do not mark exterior containers of the shipment to indicate that security classification or protective service is required. They are required, however, to complete a DD Form 1387-2 for each

shipment. This form is used *to identify and provide special handling instructions* for classified, remains of deceased personnel, in-bond, perishable, biologicals, and signature service shipments when shipped by military air. The shipper attaches once copy of DD Form 1387-2 to each container requiring special handling. The shipper furnishes the originating air terminal with three additional copies of the form and prepares the form IAW DTR, Part II, Chapter 205. An example of a “– (dash) 2,” as it is commonly called for an unclassified shipment of weapons, is shown in figure 2-22. Use of the DD Form 1387-2 is not to be confused with the use of the SDDG. If a shipment is hazardous *and* requires security, the shipper must complete *both* forms.

SPECIAL HANDLING DATA/CERTIFICATION		
1. ITEM NOMENCLATURE Rifles, 5.56MM (M-16A2)	2. NET QUANTITY PER PACKAGE 50	3. TRANSPORTATION CONTROL NO. W55XGT9102D008XXA
	4. CONSIGNMENT GROSS WEIGHT 100	5. DESTINATION W47T Spt Gp, Kuwait IAP
6. SUPPLEMENTAL INFORMATION Constant Surveillance and Custody Service (CIS) Signature and Tally Record (675)		
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 DoD 4500.9R, Part II, Chapter 205, Paragraph I.2		
8. HANDLING INSTRUCTIONS Couriers will be E-4 or higher and/or civilian grade equivalent		
9. ADDRESS OF SHIPPER 1015 Femoyer St., Ft. Lee, VA 19652		10. TYPED NAME, SIGNATURE AND DATE Sgt Brian Simmons, 12 Apr 2012 <i>Brian Simmons</i>

DD FORM 1387-2, NOV 2004 PREVIOUS EDITION IS OBSOLETE. Form Approved (OMB) No. 0704-0188 08L50D22

Figure 2-22. DD Form 1387-2.

The shipper completes the –2 according to the type and quantity of shipment and the level of security required. Part II of the DTR provides instructions for various types of shipments, but we will go over only the general requirements for unclassified and classified shipments.

Unclassified shipments

Complete the –2 for unclassified shipments as follows:

Block Number & Title		Description
1	Item Nomenclature	Enter the item nomenclature.
2	Net Quantity per Package	Enter the gross weight of the package.
3	Transportation Control Number	Enter the TCN of this package.
4	Consignment Gross Weight	Enter the total gross weight of each pallet/package shipped under the same TCN.
5	Destination	Enter the in-the-clear address of the consignee.
6	Supplemental Information	For sensitive and other cargo requiring TPS or other special services while in-transit, enter the appropriate requirements according to Chapter 205 of the DTR.
7	DTR Reference	Cite DTR Chapter 205, paragraph I.2.
8	Handling Instructions	Enter any special handling instructions required for the shipment.
9	Address of Shipper	Enter the complete in-the-clear address of the shipping activity.
10	Typed Name, Signature, and Date	Self-explanatory.

Classified shipments

When shippers complete the –2 for *classified* shipments, they must take care to not identify the shipment in the forms they fill out, so there are some *exceptions* to the form for classified shipments.

1. If none of the information entered in the blocks of the form is classified, the shipper completes four copies of the form.
2. If the information is classified, the shipper completes one copy in detail, including the essential classified data, and signs it. The shipper, IAW security regulations, forwards this copy to the air terminal where it is attached to the air manifest. When this happens, the air manifest takes the same degree of classification and is handled according to the applicable security regulations.
3. The shipper completes three additional copies of the form but leaves the majority of the form blank. The shipper completes blocks 3, 4, 5, and 6; however, block 6 will reflect the following text: “*See aircraft commander’s copy*” and the applicable TPS category as required by the DTR. The following table shows some of the *categories that may or may not apply to classified shipments*, but you may see them listed on shipping documentation:

Category	Requirement
Constant Surveillance and Custody Service (CIS)	CIS requires constant surveillance and custody of a shipment by a qualified-carrier representative and is required for CONFIDENTIAL shipments and small quantities of risk category code IV (CAT IV) small arms and ammunition. This type of shipment also requires the use of a DD Form 1907, Signature and Tally Record, or an equivalent carrier-furnished record.
Dual Driver Protective Service (DDP)	DDP requires continuous attendance and surveillance of a shipment by two qualified drivers and is used for CAT III and IV arms, ammunition, and explosives (AA&E) shipments as well as classified shipments. This type of shipment also requires a DD Form 1907 or equivalent.
Protective Security Service (PSS)	PSS requires continuous attendance and surveillance of a shipment by two qualified drivers and is used for SECRET and AA&E shipments. It also requires a DD Form 1907 or equivalent.
Military Guard Personnel (MGP)	Military police or nonmilitary police soldiers protect these shipments, which can be AA&E or other sensitive or classified cargo vital to national security as designated by the installation commander and approved by the Military Surface Deployment and Distribution Command (SDDC).
Signature and Tally Record Service (675)	675 is not a TPS category but requires shippers to use the DD Form 1907 or equivalent. It is often used for pilferable or high-value shipments.

These are just some of the categories you may see; the DTR lists many more. After the –2 is complete, the shipper places the form in a waterproof envelope and attaches it to the number one piece of the shipment.

Other requirements

When shipments are manifested for airlift, staple one copy of DD Form 1387–2 for each shipment to the manifest aboard the aircraft and one copy of the DD Form 1387–2 for each shipment to the station file copy of the manifest. In-transit terminals may reproduce completed DD Form 1387–2s as necessary.

When shipments covered by DD Form 1387-2s are offloaded at in-transit stations, remove DD Form 1387-2s from accompanying manifests. When shipments are remanifested, attach DD Form 1387-2s to the outgoing manifests.

The air terminal representative loading the special handling shipment at a non-AMC station is responsible for ensuring the aircraft commander or designated representative is thoroughly briefed on the nature and location of the shipment aboard the aircraft, including handling or treatment required.

When a shipment requires onward movement by a commercial mode of transportation, give the TMO the DD Form 1387-2 along with the inbound manifest.

Transfer of security and classified cargo

You must take great care to transfer custody of security and classified shipments no matter where you are in the chain of custody. Only US military and US civilians with the appropriate security clearance may sign for classified shipments and take custody of them.

At automated stations, use GATES/CMOS manifests to transfer custody of shipments requiring special security precautions into the AMC airlift system. At nonautomated stations or when using manual procedures, use DD Form 1907, Signature and Tally Record, to transfer custody. Terminate the transfer document offered by the shipper and file with other transportation documents arriving with the shipment. It is important to note again that the DD Form 1907 is not just used for classified shipments; it is used for any shipment that requires signature service. Figure 2-23 shows an example of a DD Form 1907. Shippers complete this form, but if you take custody of a signature service shipment and have no manifest (automated or manual) with which to take custody, you may be required to enter your information in section II as the figure shows.

Classified and security cargo shipments will not be split after being received into the airlift system unless it is necessary for palletization purposes or because a single shipment exceeds the airlift capability of a single aircraft. Maintain shipment integrity when splitting shipments for palletization purposes. Shipments split because the entire shipment exceeds a single aircraft capability will be shipped on the minimum number of aircraft possible.

All documents used to account for the transfer of signature security service cargo must reflect the correct commodity/special handling code and risk category code. Classified and security cargo shipments that are damaged or have improper documentation, packaging, markings, or labeling will be refused at originating stations unless arriving by commercial conveyance or frustrated if in-transit. When discrepancies exist with signature security service shipments, add a written statement to the manifest or transfer document describing the discrepancy. The responsible delivering agent (carrier representative, aircrew member, etc.) and you both sign the statement. Receipt for shipment using normal procedures.

All classified/security cargo will be safeguarded while in the custody of the air terminal. Notify the appropriate base security agency of requirements for armed guard surveillance of cargo within the terminal complex or on AMC aircraft. Present the local access authorization to the aircrew member prior to transfer of custody and receipt of a classified shipment.

Signature service cargo placed on pallets that contain general cargo will be handled on an individual shipment basis and will not be consolidated. Shipments moved in this manner will be visibly identifiable for accountability and proper transfer between air freight/crew members and/or couriers.

The terminal delivers material to the selected escort or aircrew members. The signature and printed name and rank of the recipient on the air manifest indicates evidence of delivery. The person who relinquishes custody of the shipment always retains a signed copy of the manifest. Send the signed copy to ATOC for inclusion in the station file records. The escort or aircrew member retains the remaining manifest copies for subsequent transfer at en route or final destination stations.

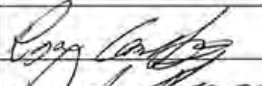


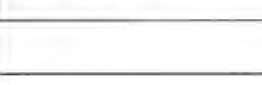
SIGNATURE AND TALLY RECORD (See DoD 4500.9-R for guidance) (Use of equivalent carrier-furnished signature and tally record is acceptable.)		OMB No. 0702-0027 OMB approval expires Jun 30, 2012		
The public reporting burden for this collection of information is estimated to average 3 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters Services, Executive Services Directorate, Information Management Division, 1155 Defense Pentagon, Washington, DC 20301-1155 (0702-0027). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.				
PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. RETURN COMPLETED FORM AS DIRECTED IN THE DISTRIBUTION INSTRUCTIONS BELOW.				
DISTRIBUTION INSTRUCTIONS				
(1) The SHIPPER will print two copies, retain one copy and give one to the Origin Carrier. (2) The ORIGIN CARRIER will deliver one copy with original signatures to the Destination Carrier. (3) The DESTINATION CARRIER will attach one copy (reflecting all original signatures) and Standard Form 1113, Public Voucher for Transportation Charges, to the original Commercial Bill of Lading and forward for payment. Reproduced completed copy of DD Form 1907 will be delivered to the Consignee and one will be retained. (4) The CONSIGNEE will ensure Destination Carrier surrenders a reproduced copy of completed form with all signatures.				
SECTION I - TO BE COMPLETED BY THE SHIPPER				
1a. SHIPPER NAME 566 AREA SPT GP, FT LEE, VA (SFC JIM ETHRIDGE)		b. ORIGIN FT LEE, VA		
2. PROTECTIVE SERVICE REQUESTED Dual Driver Protective Service		3. COMMERCIAL BILL OF LADING NUMBER 8675309		
4a. CONSIGNEE NAME MATERIAL MGT CTR AWCF SSF (SGT JEREMY FISHER)		b. DESTINATION W47T AREA SPT GP KUWAIT		
5. PERMIT NUMBER (If any)		6. TRANSPORTATION CONTROL NUMBER W55XGT9102D008XXX		
7. ROUTING Dover AFB, DE; Ramstein AB, GE; Kuwait IAP, Kuwait		8. WEIGHT 3200	9. CUBE 63	
10. SPECIAL INSTRUCTIONS Signature Service Requested		11. DATE SHIPMENT TENDERED TO CARRIER (YYYYMMDD) 20120212		
12. NAME OF CARRIER 1st TRANS BATTALION		13. NUMBER OF PIECES 1		
14. TYPE OF PACKAGE(S) (For unsealed loads only) OR CONVEYANCE IDENTIFICATION AND SEAL NUMBERS (For sealed loads only) WOODEN CRATE		15. FREIGHT CLASSIFICATION DESCRIPTION		
SECTION II - TO BE COMPLETED BY EACH PERSON ACCEPTING CUSTODY OF CLASSIFIED OR PROTECTED MATERIAL REQUIRING THE USE OF TRANSPORTATION PROTECTIVE SERVICE DURING TRANSIT				
16. CUSTODY RECORD				
PRINT NAME OF PERSON AND COMPANY REPRESENTED a.	STATION INTERCHANGE POINT DESTINATION b.	SIGNATURE OF PERSON ACCEPTING CUSTODY c.	TIME ACCEPTED d.	DATE ACCEPTED (YYYYMMDD) e.
RYAN COOMBS, 436 APS	Dover AFB, DE		17:23	20120412
DAVID STENGER, 723 APS	Ramstein AB, GE		03:04	20120414
DENNIS CROSBY, 386 ELRS	Kuwait IAP, Kuwait		22:36	20120414
WAYNE RYDER, W47T SPT GP	Kuwait City, Kuwait		23:03	20120414

Figure 2-23. DD Form 1907.

The terminal representative at en route destination, final destination, or transship point relieves the escort or aircrew member of the material upon arrival. The escort or aircrew member retains a signed manifest copy for personal records and turns over the remaining manifest copies to the terminal representative. Terminal representatives are not required to relieve escorts or aircrew members during standard ground times and where there is not a change of aircrews.

When an aircraft maintenance or operational emergency dictates an extended ground time at an en route location, an appropriate air terminal representative will accept responsibility for the cargo upon aircraft arrival. Terminal personnel determine whether the in-transit signature service cargo remains on the aircraft or is transported/stored in the terminal's secure area. In either event, the air terminal relieves the aircrew of custody. Prior to aircraft departure, an aircrew member again takes responsibility for the cargo by signing the cargo manifest.

If extended ground time is not projected, direct transfer between escorts or aircrew members may be accomplished at an en route station where the outbound escort or appropriate aircrew member is available to relieve the inbound escort or aircrew member within 30 minutes. If outbound escort or aircrew personnel are not available, an appropriate air terminal representative will accept responsibility and sign for the cargo.

The transfer cycle continues until the cargo is delivered to the consignee or a consignee representative. If the cargo is manifested to the consignee or representative a GATES/CMOS manifest or DD Form 1907 must be accomplished by APOD. These documents serve as verification of final delivery.

When unescorted classified shipments under the care of the aircraft commander or a designated representative arrive at the destination, immediately notify the consignee of the arrival of the shipment and obtain a receipt when the shipment is turned over to the consignee.

Inventorying special cargo

The special handling function is responsible for conducting an inventory of security cages/rooms, reefers, and hazardous/explosives cargo areas and will establish internal procedures to maintain accountability for security shipments pending load selection and manifesting. Under no circumstances will documents reflecting the classification of the cargo be attached to the shipment.

Access to security cages/rooms is restricted to personnel who have written authorization from the unit commander. The access list identifies authorized personnel and those who require escort and is posted inside the controlled area near the entrance.

Special handling inventories storage facilities and generates an AMC Form 214, Security Cage Log and Inventory (fig. 2-24) or an automated local product meeting the same requirements. *Inventory all cargo in security areas and transfer accountability at the beginning and end of each shift.* Outgoing and incoming shifts accomplish inventories jointly. Single-shift operations inventory security areas at the beginning and end of the shift. An inventory is not required during periods when operations are closed.

Initiate the AMC Form 214 or other automated product at the closest shift change to 0001 hours local each day. Annotate the log as shipments are placed in or removed from the storage facility. Inventory of containerized registered mail is conducted by the seal/listing.

Defense Courier Service material

DCS material shipments consist of *highly classified national security material* that requires courier escort. Courier escorts are either dedicated (assigned to the dispatching DCS station) or designated (from aircrew or pax manifest). As a minimum, all DCS material is authorized transportation priority 1 (TP-1).

[illegible]

Figure 2–24. AMC Form 214.

Dedicated DCS couriers are members of the US Armed Forces or civilian employees assigned to the DCS, possess the proper security clearance, have successfully completed the DCS Training School, are qualified by the DCS commander, and can be identified by credentials issued by the DCS. Dedicated couriers at stations located on AMC installations also have flight-line badges.

A designated courier is an appropriately-cleared active duty member of the US Armed Forces (in the grade Staff Sergeant or above) or, when authorized, a US government civilian employee (in the grade GS-5 or above) who is selected to take custody of, safeguard, and escort a particular DCS shipment.

Tanker airlift control center (TACC) channel directors (bookies) space block the material and couriers on a designated, scheduled AMC mission. Passenger charter missions are not normally used for cargo movement but can as long as it is within the limitation of the ground-handling contract and does not displace passenger baggage.

If the cargo does not have a dedicated DCS courier, a DCS representative chooses a passenger from a printed copy of the list of eligible passengers. When space-required passengers are not manifested, the DCS representative designates an eligible space-available passenger, if the person consents to the designation. In the absence of DCS couriers or qualified passengers, military aircrew personnel (Staff Sergeant and above) may be designated as couriers. Aircraft commanders may be designated if they consent and must approve the designation of copilots. All other qualified aircrew members may be designated as couriers by authorized DCS personnel. DCS will not designate aircrew members if they are scheduled to crew rest or crew change at a base where there is no DCS or provisional courier station. The designated aircrew member is responsible for safeguarding the courier material until properly relieved by a DCS representative or other competent authority acting for DCS.

Designated couriers will keep small quantities of DCS material in their personal custody; large shipments require stowage in aircraft compartments. In such cases, couriers will witness material storage and compartment securing and will board only when the aircraft is ready for departure. Couriers responsible for stowed material will board last and deplane first.

Should an aircraft make an en route stop at either a commercial or military airfield, DCS-designated couriers will be permitted to deplane to ensure there is no removal or tampering with stowed material.

DCS Responsibilities	Aerial Port Responsibilities
Ensure space-blocked cargo or passengers are coordinated to move and are delivered to the port in a sufficient amount of time to prevent disruption of aerial port operations.	Ensure appropriate aerial port agencies are notified of DCS space-block requirements.
At origin station, prepare shipments and documentation IAW DTR, Part II.	Process cargo IAW AMCI 24-101, Vol 11.
Coordinate passenger escort requirements with ATOC 12 hours prior to mission departure or within the time parameters established by local aerial port directives.	Coordinate with DCS personnel on aircraft arrival, departure, and loading information (e.g., ETA, estimated time of departure [ETD], parking spot, and courier's names, size of shipment, etc.).
Contact ATOC to determine aircraft arrival, departure, and loading information (e.g., ETA, ETD, parking spot, courier's names, and size of shipment, etc.).	At destination station, DCS personnel will contact ATOC or the Command Post to determine aircraft arrival and courier information (e.g., ETA, parking spot, designated DCS couriers' names, passenger or aircrew member, size of shipment, etc.).
For movements by dedicated couriers, ensure courier travel orders are delivered to the passenger terminal no later than three hours prior to flight departure.	Process and manifest DCS personnel on the selected mission IAW AMCI 24-101, Vol 14.
For movement by designated couriers, provide escort for the couriers and DCS material to the aircraft and support the couriers until the aircraft departs.	If required, provide escort to DCS personnel to monitor cargo loading.

Securing arms, ammunition, and explosives shipments

Provide shipments of AA&E secure storage and coordinate transportation procedures with the host base security forces. Always handle the following air commodity/special-handling codes shipments on a signature service basis using the cargo manifest: 21 through 28; 2C; 2S; 31 through 38; 3C; 3S; 41 through 48; 4C; and 4S.

Commodity/Special Handling (C/SH) Code	Risk Category Code	Risk/Protection Categories (Level of Sensitivity)	Armed Guard Requirements (See notes at bottom)	Air Terminal Requirements (See notes at bottom)
21 Unclassified	I	Highest	Note 1: Armed guard	Note 2
22 Unclassified	II	High	None	Note 2
23 Unclassified	III	Moderate	None	Note 3
24 Unclassified	IV	Low	None	Note 3
25 Secret	I	Highest	Note 1: Armed guard	Note 2
26 Confidential	I	Highest	Note 1: Armed guard	Note 2
28 Confidential	II	Highest	Note 1: Armed guard	Note 2
2C Confidential	II	High	None	Note 2
2M Pilferable	None	Nonsensitive	None	Note 3
2N Pilferable	None	Nonsensitive	None	Note 3
2S Secret	I	Highest	Note 1: Armed guard	Note 2
2Z Unclassified	None	None	None	None

Commodity/Special Handling (C/SH) Code	Risk Category Code	Risk/Protection Categories (Level of Sensitivity)	Armed Guard Requirements (See notes at bottom)	Air Terminal Requirements (See notes at bottom)
31 Unclassified	I	Highest	Note 1: Armed guard	Note 2
32 Unclassified	II	High	None	Note 2
33 Unclassified	III	Moderate	None	Note 3
34 Unclassified	IV	Low	None	Note 3
35 Secret	I	Highest	Note 1: Armed guard	Note 2
36 Confidential	I	Highest	Note 1: Armed guard	Note 2
38 Confidential	II	High	None	Note 2
3C Confidential	II	High	None	Note 2
3M Pilferable	None	Nonsensitive	None	Note 3
3N Pilferable	None	Nonsensitive	None	Note 3
3S Secret	I	Highest	Note 1: Armed guard	Note 2
3Z Unclassified	None	None	None	None
41 Unclassified	I	Highest	Note 1: Armed guard	Note 2
42 Unclassified	II	High	None	Note 2
43 Unclassified	III	Moderate	None	Note 3
44 Unclassified	IV	Low	None	Note 3
45 Secret	I	Highest	Note 1: Armed guard	Note 2
48 Confidential	II	High	None	Note 2
4C Confidential	II	High	None	Note 2
4M Pilferable	None	Nonsensitive	None	Note 3
4N Pilferable	None	None	None	Note 3
4S Secret	I	Highest	Note 1: Armed guard	Note 2
4Z Unclassified	None	None	None	None
<p>NOTE 1: Constant armed-guard surveillance to and from aircraft, at en route stops, and during loading/offloading.</p> <p>NOTE 2: Within the terminal, constant surveillance by one terminal representative. Two persons required between the storage area and the terminal or aircraft.</p> <p>NOTE 3: Within the terminal, constant surveillance by terminal personnel. One person required between storage area and the terminal or aircraft.</p>				

Valuable shipments

Render special care to shipments of an extremely valuable nature to prevent loss. When shipments of money or bullion are transported via AMC, they will be moved on a hand-receipt basis. Give these shipments the same treatment given to classified cargo.

Your organization should have written procedures for the handling, storing, and transporting (on-base) shipments of protected, sensitive, money, bullion, and other items of extraordinary value to ensure they receive the appropriate protection. Those procedures should be coordinated with the host base security forces.

Emergency shipments

Emergency shipments contain biologicals or other medical supplies of such urgency that human life is dependent upon immediate receipt. The shipper establishes life or death urgency requirements. These shipments are exempt from SET and are moved on the first available mission that provides the most expeditious movement to the shipment destination. Transfer these shipments between aircraft at en route stations if such transfer expedites movement.

Manifest these shipments separately and annotate the manifest with the words “LIFE OR DEATH URGENCY.” Handle all emergency shipments on a hand-to-hand receipt basis. The aircraft commander is briefed on the urgency of the shipment and made the custodian during flight.

Patient care shipments are medical supplies of an urgency slightly less crucial than life or death urgency. Such shipments normally have an early RDD because they are needed for scheduled surgery, have a short shelf life, and so forth. Patient care shipments are exempt from SET and moved on the first available mission to affect the most expeditious movement to destination. Shipments are identified on the air manifest as patient care in the trailer data. Patient care shipments are processed and turned over to the consignee or consignee representative as soon as possible after receipt at shipment destination.

218. Process human remains

Transporting HR is a serious matter and should be handled with respect and dignity. In addition, there are very specific procedures you must follow when shipping HR.

General procedures

Transportation of deceased military personnel and other authorized remains by AMC is authorized between overseas and the CONUS IAW AFI 34-242, *Mortuary Affairs Program*. Whenever possible, restrict movement of remains to cargo/dual-configured airlift missions. Baggage compartment space on passenger-type aircraft may be used when satisfactory service cannot be accomplished on cargo missions. Remains will not be carried on AE airlift missions.

Movement of remains by military aircraft within the CONUS is *not authorized except* as follows:

- The recovery of remains for autopsy or accident investigation purposes from the accident site to the nearest adequate military base.
- Movement by AMC of remains originating outside the CONUS from the APOD of first CONUS landing to an APOD where mortuary facilities are located.

Move remains on the *first available mission* that affects the most expeditious movement to the appropriate CONUS APOD.

Shipper responsibilities

Move remains on a space-required basis, using DTR documentation procedures. The shipping activity should provide the origin APOE with the following information as applicable, as far in advance as possible:

Military personnel	Name, grade and SSN.
Civilian employees	Name, grade, SSN, and employment data.
Contract engineering and technical services (CETS) personnel	Name and employment data.
Dependents of military personnel and civilian employees	Name of decedent; name, grade, SSN, and organization (or employment data) of the sponsor; relationship to sponsor.
Other US citizens	Name of decedent, name and address of sponsoring individual, agency or firm.

The shipper marks the case with name and address of the receiving funeral director. The shipper ensures a DD Form 2064, Certificate of Death Overseas, preferably in English, is affixed to the transfer case of deceased personnel. If the certificate is not in English, the shipper provides a statement in English, stating the cause of death. The shipper also completes a DD Form 1387-2 and attaches it to the transfer case while providing the air terminal with two additional copies.

Air terminal responsibilities

Upon receipt of remains, all air terminals advise the appropriate TACC of the planned movement. In the event the planned movement cannot take place within 18 hours of receipting for the remains, TACC takes appropriate measures to expedite onward movement of the remains. When remains are received at an AMC terminal, they are stored in a secure area and separated from other cargo. If remains are not embalmed, refrigerated storage is required and when refrigeration is not available, contact Mortuary Affairs.

When a shipment of remains has departed an AMC station of origin, move it to the destination APOD as expeditiously as possible and do not delay or offload en route, except in case of extreme emergency or if the mission becomes nonoperational. If a delay occurs, transfer remains to another mission, which will expedite onward movement.

Due to their time-sensitive nature, HRs are not bumped unless their continued movement precludes mission accomplishment or impacts flight safety. Coordinate bumping of HRs with TACC through the ATOC.

Do *not* separate escorts accompanying the remains from the shipment.

NOTE: Instruct escorts accompanying remains to the CONUS to report to the supervisor of mortuary operations at the originating APOE for a briefing. Move dependents of the deceased traveling at the same time on passenger aircraft scheduled to arrive CONUS at approximately the same time as the cargo flight transporting the deceased.

Move shipments on a hand-receipt basis using DD Form 1907 upon entry into or release from the AMC airlift system. Use the cargo manifest or TCMD as the hand-to-hand receipt within the AMC airlift system.

The destination station notifies the port mortuary officer and the agency or individual receiving the shipment of the ETA of the aircraft. Immediately upon arrival at destination APOD, makes the shipment available to the receiving individual or agency.

On/offload procedures

Ensure on/offloading is accomplished discreetly and in a dignified manner. Do not on/offload HRs concurrently with passengers/patients. Shipments will move on a separate manifest, using the manifest as a hand-to-hand receipt.

Transfer cases containing remains are stowed on the aircraft/pallet in a level position. The feet will never be higher than the head while in the stowed position. Stow transfer cases aboard aircraft with the head *toward* the nose of the aircraft and the head *higher than* the feet. This procedure assures aircraft acceleration forces are borne by the feet, thereby avoiding damage to the head.

Load remains aboard aircraft so they are among the last items to be jettisoned, if necessary. When loaded, transfer cases should be loaded in the forward most available cargo position in the event jettisoning is necessary. However, on wide body aircraft (e.g., C-5, C-17) transfer cases can be moved from one side of the aircraft to the other in the event jettisoning is required. Therefore, transfer cases may be loaded towards the rear of the aircraft, if required.

No cargo or any other items are loaded or placed on top of transfer cases containing HR. However, if more than one transfer case containing remains is shipped or stored, stacking is permitted but should be avoided if at all possible. The *maximum* number of HR transfer cases that may be *safely* transported on a single 463L pallet is 12. Place cases in three rows, each row stacked to a maximum of four. Do not sit on transfer cases containing HR.

Cremated and skeletal remains

Cremated military remains are delivered to the next of kin (NOK) by an escort. Container dimensions are limited to the size authorized for hand baggage. When cremation is accomplished by the Air Force

for other than military personnel and an escort is not authorized, mail the urn by registered mail or ship by railway or air express IAW AFI 34-242.

NOTE: Under *no* circumstances should you ship or deliver remains of active duty personnel *without an escort*.

Recovered skeletal remains shipped for identification may be moved onward by military airlift between CONUS aerial ports after arrival at APOD. Movement time limitations for normal HR do not apply to these shipments; however, they should move onward as expeditiously as possible after receipt.

219. Process refrigeration and re-icing shipments

Expedite movement of shipments requiring freezing, refrigeration, and re-icing. Provide all such shipments preferential handling within the guidelines of SET, movement indicators, assigned movement priority, and use missions providing minimum total transit time.

Receiving and inspecting

Each shipment of perishable cargo, in addition to the usual required marking and labels, arrive with one of the three versions of DD Form 1502, Frozen Medical Materiel Shipment. Upon receipt of material, review the accompanying DD Form 1502 or other documents/forms/package markings for re-icing or refrigeration/storage requirements, as applicable, to the shipment.

The *first* version of the form is the DD Form 1502, which is *bright green in color*. It is placed on all perishable cargo like vaccines that *must be kept frozen using dry ice*. Figure 2-25 shows a completed DD Form 1502. When you re-ice a shipment, you must annotate the form saying so. It is important for the shipper to completely fill out this form so everyone in the transportation chain knows when the shipment needs to be re-iced. Likewise, it is important for you to annotate when you re-iced the shipment. All dates and times on all three forms are in Julian date and GMT format.

FROZEN MEDICAL MATERIEL SHIPMENT				Form Approved OMB No. 0704-0188	
<small>Public reporting burden for this collection of information is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses.</small>					
PERISHABLE - KEEP FROZEN					
VACCINE → TEMPERATURE MUST BE MAINTAINED BELOW 32°F					
REQUIRED DELIVERY DATE (Calendar date) <u>16 Sep 12</u>					
THIS PACKAGE PACKED AT ORIGIN					
DATE	TIME	POUNDS OF DRY ICE	BY (Name)		
<u>11 Sep 12</u>	<u>0900</u>	<u>10</u>	<u>Bobby Jones</u>		
IMPORTANT					
To insure delivery of this vaccine in a satisfactory condition, it is necessary that this container be re-iced with DRY ICE on or before time indicated below. (Greenwich Meridian Time is used for overseas shipments.)					
<u>10</u> POUND(S) DRY ICE WILL SAFEGUARD CONTENTS FOR <u>72</u> HOURS WHEN RE-ICING IS DONE. AT FIRST RE-ICING POINT, CROSS OUT PREVIOUS BLOCK (Left column below) AND ENTER NEW DATE AND TIME NEXT RE-ICING IS DUE.					
MUST BE DRY RE-ICED NOT LATER THAN ↓		DRY ICE ACTUALLY ADDED			
DATE	FIRST DRY RE-ICING	DATE	POUNDS	DRY ICED BY	
<u>14 Sep 12</u>	→	<u>14 Sep 12</u>	<u>10</u>	<u>Larry Baker</u>	
HOUR <u>0900</u>	→	HOUR <u>0830</u>			
DATE	SECOND DRY RE-ICING	DATE	POUNDS	DRY ICED BY	
<u>17 Sep 12</u>	→				
HOUR <u>0830</u>	→	HOUR			
INSTRUCTIONS					
Break tape on outer container and insert necessary dry ice. IMMEDIATELY re-seal outer container and RECORD this operation on the log above. DO NOT handle this vaccine or permit container to remain open longer than is necessary for DRY re-icing.					
NOTE: FAILURE TO COMPLY WITH INSTRUCTIONS MAY ENDANGER LIVES.					
If material has thawed or if shipment arrives without dry ice, refreeze immediately. Report details by fastest means to Defense Personnel Support Center (DPSC), Directorate of Medical Materiel, 2800 S. 20th Street, Philadelphia, PA 19101-8419. Document discrepancies in accordance with AR 55-38/NAVSUP PUB 459/AFM 75-34/MCOP 4610.19/DLAR 4500.15. DO NOT issue or destroy material until disposition instructions are received from DPSC.					
DD Form 1502, APR 02 3534934			Previous editions are obsolete. 08L50D25		

Figure 2-25. DD Form 1502.

The DD Form 1502-1, Chilled Medical Materiel Shipment, is used for shipments that must *maintain a temperature between 35–46°F*. The form is *bright orange* and filled out exactly the same as the DD Form 1502. Shipments with this form are re-iced with wet ice. Figure 2-26 shows a completed DD Form 1502-1.

DD Form 1502-2, Limited Unrefrigerated Medical Materiel Shipment, is used to identify shipments that *can be removed from refrigeration for limited periods* during shipment. This form is *bright red* and indicates the times the shipment was removed and returned to refrigeration and the maximum time the item can be out of refrigeration for shipment. It is important to note that shipments with this label must not be allowed to freeze or be subjected to a temperature above 95°F. You must do your part to ensure you annotate the time you remove and return the shipment from refrigeration. Figure 2-27 shows an example of DD Form 1502-2.

CHILLED MEDICAL MATERIEL SHIPMENT				Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses.					
PERISHABLE - KEEP CHILLED					
TEMPERATURE MUST BE MAINTAINED 35° TO 46°F					
REQUIRED DELIVERY DATE (Calendar date) 16 Sep 12					
THIS PACKAGE PACKED AT ORIGIN					
DATE	TIME	POUNDS OF WATER ICE	BY (Name)		
13 Sep 12	0500	15	Harry Jones		
IMPORTANT					
To insure delivery of this vaccine in a satisfactory condition, it is necessary that this container be re-iced with water ice on or before time indicated below. (Greenwich Meridian Time is used for overseas shipments.)					
15 POUND(S) WATER ICE WILL SAFEGUARD CONTENTS WHEN RE-ICING IS DONE AT FIRST RE-ICING POINT. CROSS OUT PREVIOUS BLOCK (left column below) AND ENTER NEW DATE AND TIME NEXT RE-ICING IS DUE.					
MUST BE WATER RE-ICED NOT LATER THAN		WATER ICE ACTUALLY ADDED			
DATE	FIRST WATER RE-ICING	DATE	POUNDS	WATER ICED BY	
14 May 12	0500	14 May 12	15	Chris Baker	
DATE	SECOND WATER RE-ICING	DATE	POUNDS	WATER ICED BY	
15 May 12	0445				
INSTRUCTIONS					
Break tape on outer container and insert necessary water ice. IMMEDIATELY re-seal outer container and RECORD this operation on the log above. DO NOT handle this vaccine or permit container to remain open longer than is necessary for water icing.					
NOTE: FAILURE TO COMPLY WITH INSTRUCTIONS MAY ENDANGER LIVES.					
If materiel has frozen or if temperature has exceeded 46°F, refrigerate IMMEDIATELY. Report details by fastest means to Defense Personnel Support Center (DPSC), Directorate of Medical Materiel, 2800 S. 20th Street, Philadelphia, PA 19101-8419. Document discrepancies in accordance with AR 65-38/NAVSUP PUB 459/AFM 75-34/MCOP 4610 19/DLAR 4500.15. DO NOT issue or destroy materiel until disposition instructions are received from DPSC.					
DD Form 1502-1, APR 02		Previous editions are obsolete.			
351094		08L50026			

Figure 2-26. DD Form 1502-1.

LIMITED UNREFRIGERATED MEDICAL MATERIEL SHIPMENT					
PERISHABLE					
REQUIRED DELIVERY DATE (Calendar date) 3 JUN 2012					
IMPORTANT					
This package contains Medical Materiel which may be unrefrigerated during transit provided the cumulative time out of refrigeration does not exceed 12 hours after removal from indicated below. This materiel must be returned to refrigeration upon receipt. If disrupted en route, return to refrigeration of 36°F to 46°F temperature.					
PERIODS OUT OF REFRIGERATION			RE-ICED BY MEDICAL MATERIEL		
DATE	TIME	PLACE	DATE	TIME	PLACE
3 JUN 12	0500	OKO	3 JUN 12	0445	DNA
3 JUN 12	0618	DNA	3 JUN 12	1407	SUU
NOTE: FAILURE TO COMPLY WITH INSTRUCTION MAY ENDANGER LIVES.					
DO NOT FREEZE or allow to be subjected to temperature above 95°F at any time. If materiel has been frozen or if temperature has exceeded 46°F, refrigerate immediately. Report details by fastest means to Defense Personnel Support Center, Directorate of Medical Materiel, 2800 S. 20th St., Philadelphia, Pa. Document discrepancies in accordance with AR 65-38/NAVSUP PUB 459/AFM 75-34/MCOP 4610.15/CSAR 4600.15. DO NOT issue or destroy materiel until disposition instructions are received from DPSC.					
08L50027					

Figure 2-27. DD Form 1502-2.

Refrigeration

Maintain refrigeration units between 35°F and 46°F (2–8°C). Inspect refrigeration units for appropriate temperature range each shift change. A local form may be developed to record these inspections. Variations above or below maximum and minimum temperatures specified on in-transit shipments in storage require immediate action.

Use AMC Form 106, Biologicals/Re-icing/Refrigeration Log, to document re-icing/refrigeration actions and control of *all items requiring freezing or refrigeration*. Special handling personnel monitor and record shipments requiring re-icing/refrigeration during storage on the AMC Form 106. Shift supervisors review this log at the beginning of each shift to ensure re-icing is accomplished as necessary. All entries on the AMC Form 106 (fig. 2-28) will be legible and entered in GMT format.

TRANSPORTATION CONTROL NO.	PROCESS TIME	PIECES	WEIGHT	CUBE	APOD	STORAGE LOCATION	PLACED IN REFRIG		WET	DRY	REICING DATA				REICED PRIOR TO DEP	REICED BY (init)	DATE	TIME (Z)	BY (init)
							DATE	TIME (Z)			REICED (if accomplished)	DATE	TIME (Z)	DATE					
FM44279176D008XAX	0300	2	50	6	NK W	05	20120701	0305	<input checked="" type="checkbox"/>	<input type="checkbox"/>			20120704	1500					
FM66399177X001XXX	0830	1	30	5	K11Z	05	20120630	0845	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20120701	1500	20120705	1400	X	KJM	20120705	1400	DL
									<input type="checkbox"/>	<input type="checkbox"/>									
									<input type="checkbox"/>	<input type="checkbox"/>									

AMC FORM 106, 20020301 (IMT-V1) REPLACES AMC FORM 106, JUN 92 BIOLOGICALS/REICING/REFRIGERATION 08L50D28

Figure 2-28. AMC Form 106.

Re-icing

If re-icing is scheduled before the aircraft arrives at the next transfer point or destination, re-ice the shipment before forwarding. Special handling personnel may open, re-ice, and reseal nonhazardous shipments. When a question arises concerning preservation or condition of frozen food or chilled perishables, contact the military public health service for assistance.

Ensure the proper amount of dry or wet ice, as applicable, is used when a shipment is forwarded. If the dry ice quantity is different from the original shipment, change the SDDG to reflect the change.

Infectious substance shipments, as defined by AFMAN 24-204, must only be opened, checked, re-iced, and resealed by technical escorts, medical laboratory, or medical supply personnel.

Do not open diagnostic specimens, as defined in AFMAN 24-204, unless closing instructions are provided with the shipment. If closing instructions are not provided, contact medical laboratories or medical supply personnel for assistance. Questions regarding animal specimens being shipped for rabies testing are directed to the US Army Veterinary Service personnel. Questions regarding other diagnostic specimens are directed to medical laboratory personnel.

Whole blood is shipped with 21 whole-blood units per box requiring 14 lbs. of wet ice. When re-icing, use new plastic bags. Do not refreeze original polyethylene bags. All re-icing must be accomplished in double bags and each bag individually sealed. Whole blood must not be allowed to freeze. Do not use dry ice, salted wet ice or Gel-freeze. Specially prepared blood may be delivered to AMC frozen. Comply with shipper's instructions for these shipments. This blood should remain frozen throughout the transportation cycle.

Vaccines shipped using "Cold Chain Management" packaging will not be opened by terminal personnel. If a shipment cannot reach its destination within 15 days since the material was packed (date listed on label of shipment), then contact a cold chain representative for repacking. The cold chain contact information is listed on the cold chain management orange handling label attached to shipment.

220. Process registered mail

Aerial port personnel handle two types of mail: ordinary and registered. Ordinary mail has fewer requirements for processing and is not normally handled by special handling personnel. Registered mail, on the other hand, has many more requirements for processing, which we will go over in this lesson.

Receiving mail

Receipt for registered mail using the TCMD or manifest as a hand-to-hand receipt. Personnel receiving registered mail must check the TCNs and register numbers against the TCMD or manifest, sign one copy of the document, and return it to the individual releasing the registered mail. Personnel receipting for registered mail annotate the following:

- Full signature.
- Grade.

- Organization.
- Full printed name below the signature.

Securing mail

Registered mail may contain up to and include SECRET material; therefore, always protect, safeguard, and handle as classified cargo. Personal registered mail does not include classified documents; however, it is afforded the same degree of security afforded official registered mail. *Only* US military and US civilians with appropriate security clearance may sign for classified shipments and take custody. When a secure storage area is unavailable, post a US citizen employee to protect registered mail (this need not be an armed individual). Ordinary mail may be handled by foreign nationals, if they are designated and authorized in writing by the squadron commander.

Processing and loading

Air terminals originating large volumes of registered mail to specific locations may containerize registered mail for ease of transfer to aircrew members at planeside. Shipments are not delayed for containerization. Transfer of loose registered mail occurs in the same manner as containerized mail, except seal numbers of individual pieces will be confirmed. Registered mail should be the last item loaded aboard an aircraft and, if possible, loaded in a position readily accessible to the responsible crew member.

Stations and aircrew members must comply with the following procedures when originating and receiving containerized mail shipments:

- 1) Containers should be tri-wall-type boxes and should not exceed 45 inches in height.
- 2) The two-person concept will be used to containerize mail.
- 3) Assign pallet identifiers to the container and cap the pallet as a skid using 0.5 in the equivalent positions column.
- 4) Create a content listing in triplicate for each container. The listings will include the printed names, ranks, organization, and signatures of the individuals containerizing the mail and the seal number of the seal used on the container. Special handling ensures the correct seal number for each container is annotated on the aircraft final manifest.
 - a) One copy of the listing is placed inside the container for inventory use at the destination station.
 - b) The second copy is attached to the outside of the container for in-transit use and inventory purposes.
 - c) The final copy of the listing is filed in special handling.
- 5) Seal containers with packing tape, metal or plastic bands, and boxcar seals as a minimum. Containers are taped shut and the boxcar seal number, as well as both individuals' signatures, are prominently annotated across the tape. Containers are banded with four bands: two along the width and two along the length. A boxcar seal will is then placed at the band crimp where it cannot be removed should the bands be cut.

At planeside, the terminal representative signs all registered mail manifests indicating the container closures and seals are intact and the seal numbers on the containers and manifests match. Aircrew members will bring discrepancies to the attention of terminal representatives, who will correct them before aircraft departure. Do not make pen-and-ink changes to registration numbers or hand-scribe registered mail shipments to the final manifest. Discrepancies that cannot be corrected before departure are bumped and a new manifest is generated. One copy of the manifest is signed by the aircrew member accepting responsibility for the mail. Aircrew members remain responsible for integrity of containers and security of shipments while under their control.

Terminating procedures

Receiving aerial port personnel verify the integrity of container closures and seals at planeside. Discrepancies are brought to the attention of the responsible aircrew member and annotated on the manifests. The aircrew member and air terminal representative jointly inspect the container to verify contents prior to transfer of custody. The two-person concept is used to in-check and receive shipments into the port. Content listings and manifests are used to inventory and terminate shipments. In-checking personnel sign the content listings, which will be filed in special handling. Mail is transferred to postal personnel IAW existing procedures.

All registered mail is receipted by special handling personnel. All stations use the inbound manifest for in-processing registered mail and in-transit pallets. An air inbound registered mail manifest, truck manifest, or DD Form 1384, Transportation Control and Movement Document, is used for a receipt when registered mail is turned over to the postal authorities. The original signed copy will become the station file copy. Annotate the terminating manifest control log at the time the manifest is delivered to special handling.

The physical inventory of terminating mail will encompass the entire terminal. The special handling section is responsible for conducting the inventory of all special handling cargo and registered mail (cargo and mail that has been receipted for by TMO, postal authorities, or consignee but still located in the terminal is exempt from inventory). Reconcile all mail, which is either not listed on inventory documents or which is listed but not on hand using “can’t locate” files, over/short-shipment procedures, and so on.

Processing discrepant shipments

A discrepant shipment is a registered mail shipment that arrives at an originating, terminating, or en route station with an irregularity (i.e., torn pouch, TCN missing, incorrectly manifested). Containers with discrepancies that void the integrity of the container and could result in lost or pilfered material are not accepted for shipment until the contents are inventoried.

Originating station

It is the USPS’s responsibility to ensure registered mail arrives at the port with bar-coded labels. Do not accept the shipment into the AMC system until USPS authorities correct all discrepancies.

Terminating or en route stations

When a shipment arrives and the manifested TCN does *not* match the TCN on the shipment, accomplish the following:

1. Annotate the manifested line item with the incorrect TCN as a short shipment.
2. Add the shipment to the bottom of the automated manifest or prepare a DD Form 1384/1385, Cargo Manifest, and document as an overshipment.
3. Annotate all copies of the manifest with a statement describing the discrepancy. The responsible crew member and air terminal representative sign the statement. Notify the local USPS, which takes appropriate action.
4. The air terminal representative receipts for the registered mail after the specified annotations are accomplished. The aircrew signs to confirm discrepancies as annotated.
5. The air freight officer/superintendent, or equivalent, initiates over/short-shipment procedures to solve the discrepancy.

221. Process expedited shipments

Special handling personnel do not exclusively handle all types of expedited shipments and not all of these shipments are considered special cargo, as handled by special handling. In this lesson, we will discuss AMC MICAP shipments, VVIP shipments, and FSS shipments, which are all handled by

special handling personnel. We also will discuss green sheet and purple sheet shipments, which can be handled by anyone, special handling or not.

AMC MICAP/VVIP/FSS shipments

AMC MICAP shipments are aircraft parts and recovery equipment movements directed and centrally managed by TACC.

FSS shipments are a category of cargo that moves in the AMC airlift system that supports AMC aircraft.

VVIPs are as follows:

- Mobility Readiness Spares Package (MRSP) resupply and retrograde.
- FSS resupply and retrograde.
- Spare aircraft engines at AMC en route locations.
- Auxiliary power units at AMC en route locations.

Supply activities are exempt from submitting ATCMD to the ACA. These shipments are also exempt from movement by SET.

The special handling section is responsible for aerial port handling of these shipments. Segregate all MICAP/VVIP and FSS shipments from other cargo in the air terminal by using separate holding areas to allow ready identification and expeditious movement of the material. Transfer AMC MICAP and VVIP shipments on a hand-receipt basis using the cargo manifest.

ATOC coordinates with 618 AOC/APCC to move AMC MICAP and VVIP on the mission providing the earliest arrival at destination. Limit AMC MICAP/VVIP and FSS items transported aboard commercial passenger flights to small items that can be loaded in the cargo/baggage compartment. Use of passenger aircraft is at the discretion of aerial port management as long as AMC MICAP cargo does not take precedence over space required (S/R) passengers; however, such items may displace space-available passengers if weight is the limiting factor rather than number of seats.

When using commercial passenger flights to move MICAP items, the following procedures apply:

1. Limit shipment to nonpassenger prohibitive cargo. Shipments must not exceed 100 lbs. and must fit into the baggage compartment of the aircraft IAW AMCI 24-101, Vol 9.
2. Shipment will not delay scheduled departure of aircraft.
3. To prevent loss, designate a courier to accompany MICAP shipments. ATOC will notify passenger service that an MICAP shipment is to be placed aboard a commercial passenger flight. Passenger service will select an unaccompanied passenger to accompany the cargo.
4. The courier will receipt for the shipment by signing the station copy of the cargo manifest and will receive aircraft copies of the manifest for turnover to the destination station.
5. The senior ATOC representative on duty will confirm receipt of shipments and notify 618 AOC/APCC that the items were loaded prior to aircraft block time.

Upon arrival at the destination, special handling will have the cargo available to the consignee for pickup as soon after aircraft arrival as possible *but not later than 30 minutes after receipt*.

Whether the shipments are originating or terminating at your station, you must use AMC Form 35, Terminating AMC MICAP/VVIP Control Log, or AMC Form 36, Originating AMC MICAP/VVIP Control Log, as appropriate to control and monitor AMC MICAP and VVIP shipments. Figures 2-29 and 2-30 illustrate the two forms.

ORIGINATING AMC MICAP/VVIP CONTROL LOG										PERIOD COVERED				
										FROM 20120701		TO 20120731		
RECEIVING INFORMATION										SHIPPING INFORMATION				
ITEM DESCRIPTION	DATE	TIME	ORIG	TRANSPORTATION CONTROL NUMBER	PIECES	WEIGHT	CUBE	DATE	TIME	AIRCRAFT TYPE	NUMBER	MISSION NUMBER	DEST	REMARKS
Airmaster	20120701	0300	5003	FB44279183X001XXX	1	50	5	20120702	0800	C-17	01268	PDP 03P3 00 183	NK W	

AMC FORM 36, 19920601 (IMT-V1)

REPLACES MAC FORM 425, 19891001

08L50D29

Figure 2-29. AMC Form 36.

TERMINATING AMC MICAP/VVIP CONTROL LOG										PERIOD COVERED			
										FROM 20120701		TO 20120731	
RECEIVING INFORMATION										TERMINATING INFORMATION			
NOMENCLATURE	DATE	TIME	ORIG	TRANSPORTATION CONTROL NUMBER	PIECES	WEIGHT	CUBE	PRINTED NAME OF PERSON MAKING CALL	TIME CALLED	PRINTED NAME OF PERSON RECEIVING CALL	PICK-UP TIME	REMARKS	
Airmaster	20120703	1100	5003	FB44279183X001XXX	1	50	5	Sgt Elizabeth Harris	1110	SrA Kenneth Reed	1126	PDP 03P3 00 183	

AMC FORM 35, 19920601 (IMT-V1)

REPLACES MAC FORM 425A, 19891101

08L50D30

Figure 2-30. AMC Form 35.

Green sheet and purple sheet shipments

Sometimes shippers need their cargo faster than they originally anticipated and need to request green sheet or purple sheet actions. There are two different procedures for each type of cargo. Green sheet and purple sheet cargo are not necessarily handled by special handling personnel, unless the item is already handled by them (e.g., hazardous, signature service, etc.). Almost any type of cargo can be green sheeted or purple sheeted if requirements and authorizations dictate.

Green sheet procedures

Green sheet action is a procedure where a specifically identified and urgently needed shipment of *one service already on hand at an air terminal may gain movement precedence over cargo of that service* which is not green sheeted, including 999 expedited shipments. For example, if an Army shipper green sheets a shipment, that shipment will have movement precedence over other Army cargo *only*—not Navy, Air Force, or Coast Guard. Green sheet is not a transportation priority but is designed to override priorities when expedited movement of specific shipments is required in the national interest and is certified as an operational necessity by the sponsoring service. Green sheet is not approved if other procedures will meet the movement requirement.

Requests for green sheet action must be submitted to the service ACA by CONUS activities who in turn notify the CSB at the CONUS aerial port. Overseas green sheet requests will be submitted to the ACA who, in turn, will notify load planning.

EXCEPTION: In the *absence* of CSB or ACA action, the air terminal operations officer may initiate green sheet action when *necessary* to meet RDD. Blanket green sheet action is not authorized; judicious application of green sheet procedures is essential to preserve their effectiveness.

APOEs will accommodate green sheet requests to the maximum extent consistent with airlift management effectiveness. AMC, however, has final authority for determining the method for providing timely and responsible movement consistent with priority and movement precedence determined by the shipper service.

One copy of the AMC Form 101, Green Sheet Request (fig. 2-31), or letter is accomplished by the requesting agency for each TCN affected. This, combined with other procedures, provides adequate documentation of the green sheeting action within the port. Return or route the AMC Form 101 to the

appropriate CSB or ACA for retention and disposition. Remanifesting stations are not required to maintain a file copy of the AMC Form 101.

Load planning acknowledges receipt of the request by signing and annotating the date and time in the "APOE approval signature" block on the AMC Form 101.

At automated stations, load planning functions will enter an alpha code "G" in the special priority field of the prime TCMD record and create miscellaneous information trailer data (DI code T_I) containing the term "Green sheet as of (insert the GMT hour and date the code request was received)." This trailer record remains through all transshipment points to final destination.

At manual stations, the load planning functions ensure the statement "Green sheet as of (in the clear date and GMT of request)" is typed or printed in the remarks block (item 21) of the DD Form 1384 manual TCMD and under applicable line entries on the manifest. DI code T_I applies.

For either green sheet or purple sheet cargo, air terminal personnel annotate the changes on the pallet placard as well (e.g., "GS" [Green Sheet] or "PS" [Purple Sheet]) in the miscellaneous information block.

If a situation arises in which airlift capability cannot move all green sheet cargo on hand for a particular sheet, notify the appropriate TACC/APCC of the situation.

Purple sheet procedures

The purple sheet process is used for specifically identified cargo already in the AMC system that is in-transit to the US Central Command (USCENTCOM) AOR. If a shipment is authorized purple sheet movement, it will be moved ahead of all other cargo, including 999 and green sheet, regardless of service and SET. It is used to expedite movement of specific shipments of national interest and operational necessity. Purple sheet expediting applies from the time it is identified to its arrival at the APOD.

Purple sheet cargo must be coordinated through various levels of command authority, but eventually, 618 AOC/APCC will task the aerial ports to expedite a shipment using purple sheet procedures. ATOC will receive the tasking and notify all of the applicable work centers and verify the shipment is on hand and airlift ready. ATOC also notifies the ACA or CSB of the purple sheet tasking.

GREEN SHEET REQUEST			
TO 436 APS/TRKL		DATE 20120409	
TCN FB230091809001XXX	PC i	WT 3,200	CU 63
DESTINATION FB5612 435 ABW LRS RAMSTEIN AB, GE	SHIPPER FB2300 TMF WPAFB, OH	TAC CODE F8RL	
PRIORITY 2	TYPE COMMODITY/DESCRIPTION Diesel Generator		
AUTHORITY FOR REQUEST DOV AFB ACA / DTR			
WAREHOUSE/STORAGE LOCATION 29			
REMARKS			
REQUESTING AGENCY 436 APS/ACA		NAME OF REQUESTER Mr. Ted Vierra	
SIGNATURE OF REQUESTER 		APOE APPROVAL SIGNATURE 	

AMC FORM 101, JUN 92 (IMT-V1)

REPLACES MAC FORM 101, FEB 84

08L50D31

Figure 2-31. AMC Form 101.

Either the ACA/CSB or an air freight representative will make the changes in GATES or on the manual TCMD identifying the shipment as purple sheet in the same manner as green sheet. “Purple sheet as of [whatever time the shipment was purple sheeted]” will be entered in trailer data. No code currently exists to identify purple sheet in the special priority block, but if the shipment is not already TP-1, 999, change those fields to reflect that priority and expedited handling indicator. Be sure to also change the information on the pallet placard as mentioned previously.

Purple sheet cargo is manifested separately with the marking “Purple sheet cargo” on the manifest. Since this cargo is high-visibility, air terminal leaders ensure its movement is well-coordinated. This may mean that special handling personnel may load the cargo, if necessary. Purple sheet cargo does not bump cargo already manifested on a mission but moves on the first-available mission.

When purple sheet cargo arrives at the APOD, release the shipment to its consignee as quickly as possible using automated or manual procedures.

222. Nuclear weapons related material

As an air transportation specialist you may come across shipments classified as nuclear weapons related material (NWRM). NWRM material is received by special handling personnel and may be unclassified or classified but is handled and shipped as classified, protected cargo. You have already learned the ins and outs of handling classified shipments in the previous lessons. NWRM is treated the same but has some unique characteristics.

NWRM definition

There are two similar definitions of NWRM. One definition was issued by the Office of the Secretary of Defense (OSD) and reads as follows:


“Classified or unclassified assemblies and subassemblies (containing no fissionable or fusionable material) identified by the military departments that comprise or could comprise a standardized war reserve nuclear weapon (including equivalent training devices) as it would exist once separated/removed from its intended delivery vehicle.”

The Air Force adds to this definition by saying:

“Select nuclear combat delivery system components and use control equipment that are design sensitive, or needed to authorize, prearm, arm, launch, release or target a nuclear weapon, or needed to maintain and protect system integrity.”

What does this mean to you as a special handling representative? It means that you must pay special attention to how you handle NWRM shipments. It also means there are specific training, marking and packaging, storing, and accepting and releasing requirements to abide by when handling NWRM. Let’s take a look at these areas.

NWRM training

All personnel performing the functions of cargo special handling, freight, ramp services, or load planning duties must complete the NWRM fundamentals course. This course is available at the AF Advanced Distance Learning System (ADLS) website through the AF Portal. Once in the ADLS website, go to “Course List,” then in the “Keywords” dialog box, type NWRM. The NWRM fundamentals course will populate. Additionally, a *minimum of 10 percent* of authorized aerial port personnel must be appointed in writing by the unit commander prior to performing NWRM duties. Those personnel appointed in writing are assigned the special experience identifier (SEI) 839 and must complete the NWRM fundamentals course *annually*. 

NWRM special considerations

As previously mentioned, NWRM shipments are *handled as classified material*. The shipper is responsible for clearly identifying the shipment as NWRM. A DD Form 1387-2 is used to identify as needing special handling. NWRM is *identified* with a *commodity* code “5” and *special handling* code “Y”. You will find these identifiers on the TCMD and DD Form 1387-2. NWRM shipments should

be prepared, packaged, and sealed in a manner that minimizes the risk of accidental exposure or undetected deliberate compromise.

Great care must be taken to properly secure NWRM shipments. You store NWRM shipments as you would signature service and/or classified material. NWRM must be segregated and secured in a key-and-lock-type storage unit or cage.

When transferring custody of NWRM shipments, it is the same as with signature service or classified material. Automated stations use a GATES/CMOS manifest and nonautomated stations or when manual procedures are required, use a DD Form 1907 to transfer custody.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

217. Process classified shipments

1. Which form is used to identify and provide special handling instructions for classified, remains of deceased personnel, in-bond, perishable, biological, and signature service shipments?
2. In how many copies does the shipper prepare the DD Form 1387-2 for unclassified shipments?
3. For classified shipments, how are the three copies of the DD Form 1387-2 prepared?
4. When special cargo is manifested for airlift, how is the DD Form 1387-2 distributed?
5. Who is authorized to sign for and take custody of classified shipments?
6. Which form is used at nonautomated stations or during manual procedures to transfer custody of shipments requiring special security precautions?
7. When discrepancies exist with signature service shipments, what must you annotate on the manifest or transfer document?
8. Which form is used to inventory secure storage facilities?
9. When is the inventory of the secure storage accomplished?

10. How are DCS personnel scheduled for an AMC mission?
11. What are the procedures for manifesting an emergency shipment?

218. Process human remains

1. Which two documents must shippers attach to HR transfer cases?
2. When an air terminal receives HR at the originating station, what agency are they required to notify?
3. Which forms do you use to transfer custody of HR, and when is each one used?
4. When an air terminal receives HR at the terminating station, what agency are they required to notify?
5. How are HR stowed or loaded on the aircraft?
6. What are the rules concerning stacking and loading items on top of transfer cases?

219. Process refrigeration and re-icing shipments

1. Which form is used to indicate that a shipment must be kept frozen?
2. On the DD Form 1502 and 1502-1, what are you responsible for annotating?
3. For what is the DD Form 1502-1 used?
4. Which form is used to document re-icing and refrigeration actions and control of all items requiring freezing or refrigeration?

5. Infectious substances must only be opened by whom?
6. When is it OK to open diagnostic specimen shipments?
7. How will whole-blood shipment boxes be packed?

220. Process registered mail

1. What form(s) do you use to receipt for registered mail?
2. When receipting for registered mail, what two numbers must you check against the documents, and what must you annotate on the document?
3. When may an air terminal containerize registered mail?
4. When creating a content listing for a container of registered mail, what information must it contain?
5. How are the copies of the container content listings distributed?
6. What can you *not* do to registered mail manifests?
7. When receiving registered mail from an aircraft/mission, who inspects the container to verify content and transfer custody?
8. At originating stations, what do you do if a registered mail shipment arrives at the air terminal with discrepancies?
9. What are the procedures for documenting a discrepant registered mail shipment at terminating or en route stations?

221. Process expedited shipments

1. What is an AMC MICAP shipment?
2. AMC MICAP and VVIP shipments are exempt from what requirements?
3. Who does ATOC coordinate with to move AMC MICAP and VVIP on the mission providing the earliest arrival at destination?
4. How long after receipt does special handling have the cargo available to supply or TMO for pickup?
5. Which forms are used to control and monitor AMC MICAP and VVIP shipments at originating and terminating stations, respectively?
6. What is a green sheet shipment?
7. To which agency are green sheet requests initially submitted?
8. What form is used to request green sheet action?
9. What do you annotate on the manual TCMD to signify a shipment is green sheet?
10. How do you annotate green sheet or purple sheet items on the pallet placard?
11. What is purple sheet cargo?
12. What do you annotate on the manual TCMD to signify a shipment is purple sheet?
13. How is purple sheet manifested?

222. Nuclear weapons related material

1. Who receipts for NWRM cargo, and how is it handled and shipped?
2. What is the Air Force's definition of NWRM?
3. Who completes the NWRM fundamentals course?
4. What percentage of aerial port personnel must be appointed in writing to handle NWRM, and what are their training requirements?
5. Who is responsible for identifying a shipment as NWRM?
6. On TCMD and DD Form 1387-2, how are NWRM shipments identified?
7. How do you secure NWRM shipments?
8. How do you transfer custody of NWRM shipments?

Answers to Self-Test Questions**213**

1. To expose the minimum number of people to the minimum amount of explosives for the minimum amount of time.
2. (1) c.
(2) a.
(3) d.
(4) a (also b and c).
(5) b and d.
(6) e.
(7) b and d.
(8) b and d.
3. (1) c.
(2) f.
(3) i.

- (4) a.
- (5) h.
- (6) b.
- (7) g.
- 4. A distinct and separate hazardous item that is a component of integral part of a larger item, considered the primary hazard.
- 5. Place the hazardous cargo on the pallet so the labels are clearly visible, or apply required labels to a marker board to identify the presence of each hazard classification.
- 6. UN package specification marking.
- 7. AMC Form 1033 in three copies.
- 8. The transshipper or CSB/ACA.
- 9. AMC Form 1015.
- 10. Protective clothing and spill control kits.
- 11. Do not use bale hooks or tumble, drag, drop, throw, roll, or walk them.

214

- 1. Primary.
- 2. Compatibility group.
- 3. These articles must not be loaded, transported, or stored together.
- 4. These articles must not be loaded, transported, or stored together unless separated by a distance of 88 inches in all directions.
- 5. There are no restrictions for these items.
- 6. If a numbered note appears below or next to one or more of the hazard classes you are looking for in the table.
- 7. When an aircraft or mission is authorized to operate under Chapter 3 provisions.

215

- 1. Display placards prominently at the front, rear, and both sides of the aircraft. Ensure placards are facing away from the aircraft.
- 2. (1) a.
 - (2) a.
 - (3) b.
 - (4) b.
 - (5) b.
 - (6) b.
 - (7) b.

216

- 1. Refuel your vehicle, inspect your vehicle, be trained to handle and transport explosives, and ensure the load is restrained.
- 2. Chock them.
- 3. So the loadmaster/boom operator has easy access to it in-flight and positions it aft of nonjettisonable cargo, unless its size, weight, and location permits jettisoning by hand.
- 4. Discharge yourself or equalize your static electrical potential with that of the aircraft, vehicle, or handling equipment.
- 5. A qualified shipper or aircraft maintenance personnel.

217

- 1. DD Form 1387-2.
- 2. The shipper affixes one copy to each container requiring special handling, plus three additional copies.

3. The shipper completes blocks 3, 4, 5, and 6; however, block 6 reflects "See aircraft commander's copy" and the applicable TPS category.
4. Staple one copy to the aircraft manifest and one copy to the station file copy of the manifest.
5. Only US military and US civilians with the appropriate security clearance.
6. DD Form 1907.
7. A written statement describing the discrepancy and signatures from the delivering agency and you (the air terminal representative).
8. AMC Form 214.
9. At the beginning and end of each shift, jointly if applicable.
10. TACC channel directors (bookies) space block the couriers and their material on a designated scheduled AMC mission.
11. Manifest them separately and annotate the manifest with the words "LIFE OR DEATH URGENCY."

218

1. DD Form 2064 and DD Form 1387-2.
2. TACC.
3. Use DD Form 1907 for shipments entering or being released from the AMC airlift system. Use the cargo manifest or TCMD within the AMC airlift system.
4. The port mortuary officer and the agency or individual receiving the shipment.
5. Stow HR in a level position with the head towards the nose of the aircraft. Load them so they are among the last items to be jettisoned.
6. No cargo or other items will be loaded on top of transfer cases. Stacking is permitted but should be avoided if possible. In that case, stack them in rows of three or four cases high to a maximum of 12 transfer cases per 463L pallet.

219

1. DD Form 1502.
2. The Julian date and GMT you re-iced the shipment.
3. For shipments that must maintain a temperature between 35°F–46°F.
4. AMC Form 106.
5. By technical escorts, medical laboratory, or medical supply personnel.
6. When closing instructions are provided with the shipment.
7. Whole blood will be shipped with 21 whole blood units per box requiring 14 lbs. of wet ice.

220

1. TCMD or manifest.
2. Check the TCNs and register numbers against the document and annotate the full signature and printed name, grade, and organization on the document.
3. For ease of transfer when they have large volumes of registered mail.
4. The printed names, ranks, organization, and signatures of the individuals.
5. One copy is placed inside the container; the second copy is attached to the outside of the container; and the third copy is filed in special handling.
6. You may not make any pen-and-ink changes to registration numbers or hand-scribe registered mail shipments to the final manifest.
7. The aircrew member and air terminal representative jointly.
8. Refuse the shipment until the USPS corrects all discrepancies.
9. (1) Annotate the manifested line item with the incorrect TCN as a short shipment.
(2) Add the shipment to the bottom of the automated manifest or prepare a DD Form 1384/1385 and document as an overshipment.
(3) Annotate all copies of the manifest with a statement describing the discrepancy.

- (4) Receipt for the registered mail.
- (5) Air freight officer/superintendent initiates over/short-shipment procedures.

221

1. Aircraft parts and recovery equipment movements directed and centrally managed by TACC.
2. Submission of ATCMDs to the ACA and movement by SET.
3. APCC.
4. As soon after aircraft arrival as possible but not later than 30 minutes after receipt.
5. AMC Form 35 and AMC Form 36.
6. A procedure where a specifically identified and urgently needed shipment of one service already on hand at an air terminal may gain movement precedence over all other cargo of the same service.
7. ACA.
8. AMC Form 101.
9. Type or print "Green sheet as of (in the clear date and GMT of request)" in the remarks block.
10. Write "GS" (Green sheet) or "PS" (Purple sheet) in the miscellaneous information block.
11. Specifically identified cargo already in the AMC system that is in-transit to the CENTCOM AOR.
12. Type or print "Purple sheet as of (in the clear date and GMT of request)" in the remarks block.
13. Separately with the marking "Purple sheet cargo."

222

1. NWRM material is receipted for by special handling personnel and may be unclassified or classified but is handled and shipped as classified, protected cargo.
2. Select nuclear combat delivery system components and use control equipment that are design sensitive, or needed to authorize, prearm, arm, launch, release or target a nuclear weapon, or needed to maintain and protect system integrity.
3. All personnel performing the functions of cargo special handling, freight, ramp services, or load planning duties must complete the NWRM fundamentals course.
4. A minimum of 10 percent of authorized aerial port personnel must be appointed in writing by the unit commander prior to performing NWRM duties. Those personnel appointed in writing will be assigned SEI 839 and must complete the NWRM fundamentals course annually.
5. The shipper.
6. With a commodity code "5" and special handling code "Y".
7. NWRM must be segregated and secured in a key-and-lock-type storage unit or cage.
8. Automated stations use a GATES/CMOS manifest and nonautomated stations or when manual procedures are required, use a DD Form 1907.

Complete the unit review exercises before going to the next unit.

Unit Review Exercises

Note to Student: Consider all choices carefully, select the *best* answer to each question, and *circle* the corresponding letter.

55. (213) Which hazardous materials class consists of explosive materials?
- a. 1.
 - b. 2.
 - c. 3.
 - d. 4.
56. (213) Which hazardous materials class consists of infectious and toxic materials?
- a. 4.
 - b. 5.
 - c. 6.
 - d. 7.
57. (213) Which hazardous materials class consists of corrosive materials?
- a. 6.
 - b. 7.
 - c. 8.
 - d. 9.
58. (213) Which hazardous materials class consists of miscellaneous hazardous materials?
- a. 6.
 - b. 7.
 - c. 8.
 - d. 9.
59. (213) Which form do inspectors use to inspect and frustrate hazardous materials shipments?
- a. DD Form 1385, Military Shipment Label.
 - b. DD Form 1387-2, Special Handling Data/Certification.
 - c. AMC Form 1033, Shipper's Declaration for Dangerous Goods.
 - d. AMC Form 1015, HazMat Inspection and Acceptance Checklist.
60. (214) In the hazardous materials compatibility tables, the letter "X" means these articles
- a. must not be loaded, transported, or stored together.
 - b. have notes you must refer to, to determine compatibility.
 - c. have no restrictions for being loaded, transported, or stored together.
 - d. must not be loaded, transported, or stored together unless separated by at least 88 inches in all directions.
61. (214) In the hazardous materials compatibility tables, the letter "O" means these articles
- a. must not be loaded, transported or stored together.
 - b. have notes you must refer to, to determine compatibility.
 - c. have no restrictions for being loaded, transported or stored together.
 - d. must not be loaded, transported, or stored together unless separated by at least 88 inches in all directions.

62. (215) The area surrounding aircraft transporting hazardous materials must be placarded to
- let the explosives handlers know which aircraft to take the shipments.
 - warn flight line personnel to stay outside of a 50-yard radius of the aircraft.
 - warn the aircrew that they will be transporting hazardous shipments to their next destination.
 - let emergency response and other personnel know of hazardous materials and explosives presence.
63. (215) When placarding aircraft, how must hazardous materials placards be displayed?
- Front only and at entry points.
 - Front and rear only and at entry points.
 - Cargo loading end and both sides only.
 - Front, rear, both sides and at entry points.
64. (215) Which class requires a placard for any amount of hazard?
- 1.6.
 - 5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled).
 - 7 (Radioactive category III – Yellow label only).
 - 8.
65. (215) Which class requires a placard for 1,001 pounds or more aggregate gross weight of material?
- 1.1.
 - 1.2.
 - 2.1.
 - 4.3.
66. (216) What is the *minimum* number of fire extinguishers a vehicle must contain while transporting explosives?
- None.
 - One.
 - Two.
 - Three.
67. (216) Where on the aircraft should hazardous materials be loaded?
- Aft of non-jettisonable cargo.
 - Forward on non-jettisonable cargo.
 - Anywhere, as long as it is compatible.
 - On the right side only, as long as it is compatible.
68. (216) During explosives operations, to reduce electrostatic discharge, aircraft is
- vented.
 - braced.
 - cleaned.
 - grounded.
69. (217) Which form must shippers complete for security or classified shipments?
- DD Form 1387-2, Special Handling Data/Certification.
 - AMC Form 1015, HazMat Inspection and Acceptance Checklist.
 - DD Form 1497-2, Security and Classified Shipment Tally Record.
 - AMC Form 1033, Shipper's Declaration for Dangerous Goods (SDDG).

-
-
70. (217) If a shipment is hazardous and requires security, which form(s) must shippers complete?
- DD Form 1387-2, Special Handling Data/Certification only.
 - AMC Form 1033, Shipper's Declaration for Dangerous Goods (SDDG) only.
 - DD Form 1387-2 and AMC Form 1033.
 - DD Form 1387-2, AMC Form 1033 and AMC Form 1015, HazMat Inspection and Acceptance Checklist.
71. (217) When using manual procedures, you transfer custody of a shipment requiring security precautions by using the
- AMC Form 214, Security Cage Log and Inventory.
 - DD Form 1907, Signature and Tally Record or manual manifest.
 - Global Air Transportation Execution System (GATES) manifest.
 - AMC Form 1015, HazMat Inspection and Acceptance Checklist.
72. (217) What is Defense Courier Service (DCS) material?
- Human remains (HR) shipments that require courier escort.
 - Highly classified national security shipments that require courier escort.
 - Biological defense and refrigeration shipments that require courier escort.
 - Money or gold bullion shipments that require high security and courier escort.
73. (218) What is the *maximum* number of human remains (HR) transfer cases that can be safely transported on one 463L pallet if absolutely necessary?
- 3.
 - 4.
 - 6.
 - 12.
74. (219) You received a vaccine shipment that requires dry ice. Which form must be on the shipment to identify the requirement for dry ice?
- DD Form 1502, Frozen Medical Material Shipment.
 - DD Form 1502-1, Chilled Medical Material Shipment.
 - DD Form 1502-2, Limited Unrefrigerated Medical Material Shipment.
 - DD Form 1502-3, Shipper's Declaration for Dangerous Goods.
75. (219) You received a vaccine shipment that can be removed from refrigeration for short periods of time. Which form must be on the shipment to identify this requirement?
- DD Form 1502, Frozen Medical Material Shipment.
 - DD Form 1502-1, Chilled Medical Material Shipment.
 - DD Form 1502-2, Limited Unrefrigerated Medical Material Shipment.
 - DD Form 1502-3, Shipper's Declaration for Dangerous Goods.
76. (220) When receiving registered mail, the two pieces of information you must check against the manifest are the
- register number and the transportation priority (TP).
 - register number and the required delivery date (RDD).
 - transportation control number (TCN), weight, and cube.
 - TCN and register number.
77. (220) At a *minimum*, seal consolidated registered mail containers with
- packing tape and boxcar seals.
 - packing tape and plastic or metal bands.
 - packing tape, plastic or metal bands, and boxcar seals.
 - metal or plastic bands, spray adhesive, and boxcar seals.

78. (221) The Army receives approval to green sheet a piece of cargo. The cargo will move ahead of
- a. all other Army cargo.
 - b. a Navy piece of 999 cargo.
 - c. all other cargo in the air terminal.
 - d. an Air Force piece of purple sheet cargo.
79. (221) You work at an air terminal without an Air Clearance Authority (ACA) or a Customer Service Branch (CSB) and receive a call from a Navy customer who wants to green sheet some Navy equipment. Who initiates green sheet action for this customer when it is necessary to meet a shipment's required delivery date (RDD)?
- a. Air freight officer.
 - b. Squadron commander.
 - c. Air terminal operations officer.
 - d. Air Terminal Operations Center (ATOC) outbound controller.
80. (222) All personnel performing what functions are required to complete the nuclear weapons related material (NWRM) fundamentals course?
- a. Passenger service, Air Terminal Operations Center (ATOC), and load planning.
 - b. Special handling, freight, ramp services, and load planning.
 - c. Special handling, freight, ramp services, ATOC, security cage, and load planning.
 - d. Special handling, freight, ramp services, passenger service, ATOC, and load planning.
81. (222) In addition to individuals who are required by function to handle nuclear weapons related material (NWRM), what *minimum* percentage of authorized aerial port personnel must be appointed in writing, and must complete the NWRM fundamentals course annually?
- a. 5%.
 - b. 10%.
 - c. 20%.
 - d. 25%.

Unit 3. Ramp Operations

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YOU KNOW HOW to receive, process, and palletize all types of cargo whether it is general, hazardous, or special handling; now comes the time to load the aircraft. In this unit, you will learn what to do before you load the aircraft as well as how to load the aircraft. You will learn the importance of selecting the correct loading equipment. You will learn how to determine shoring requirements and how to prepare the aircraft for loading. You will learn how to operate safely around aircraft and how to load and secure cargo. Lastly, you will learn about some special loading procedures that are critical to moving cargo quickly and safely.

3-1. Preload Operations

In this section, assume the cargo has been load planned and you are working in the aircraft services section. We will briefly review the various vehicles and material handling equipment you have available to load aircraft. We will go over shoring requirements for various types of cargo, procedures for setting up cargo and mail for loading, and finally, we will go over how to prepare the aircraft to accept the load.

223. Select loading equipment

Let's quickly review the MHE used at air terminals, which is part of the 463L system. The 463L system is compatible with many transportation methods. In this lesson, we look at the process of selecting the equipment you use to load and unload aircraft. This includes forklifts, the Halvorsen, and the 60K-Tunner loader. Keep in mind that these vehicles are not restricted to cargo operations. Passenger services personnel use forklifts and K-loaders for baggage operations as well, and fleet service personnel use them for transporting the air transportable galley/lavatory (ATGL) and other operations. The smoothness of the operation relies heavily on how well you *select the loading* equipment. Determining what equipment to use depends on several things:

1. The number and type of equipment items available.
2. The number of qualified drivers available.
3. The inbound and outbound flight schedule (how busy you will be).
4. The type of cargo being on/offloaded.

To ensure the maximum use of resources, you *must* select the proper equipment. Using two Halvorsens instead of one 60K to move six pallets requires extra manpower and equipment that could be used elsewhere (e.g., at another aircraft). Keep in mind that certain K-loaders do not have the capability to load certain aircraft, so when you are busy and have a limited number of Halvorsen and 60K-loaders, reserve them for wide-body aircraft if required. In addition to considering equipment,

you must also consider personnel. Load teams' size depends on the size of the load and the type of aircraft. Consider the operations tempo and nature of the load when balancing between the required number of drivers and other load team members. In certain situations, it is beneficial to use a limited number of drivers to shuttle loads. If the load team were low on manpower, having drivers sitting idle would not be the best use of drivers.

Sometimes, the schedule can be hectic. Planes land at the same time and you have to be in two places at once. Other times, you may be working under a load director for the aerial port expeditor (APEX) program and have the flexibility to load aircraft on your unit's own schedule. Ensure you look ahead to forecast which equipment items might be needed and when so you do not delay an aircraft.

Lastly, some cargo items can only be on/offloaded with certain equipment. For example, if you have to download a four-pallet train with overhang loaded in the logistic rail system (LGS) of a C-17, you may want to keep your 60K-loader available during that time. If you only have one, ensure it is not being used for other, less restrictive loads, like single pallets. Also, make sure you have any required prime movers (towing equipment) necessary to load trailers and other rolling stock.

You can use the bare tines of a forklift to load/offload an aircraft, if needed for training or when rollerized tines are not available. However, use rollerized tines when they are available.

If using a pry bar to assist with loading, use only pry bars equipped with three hard-rubber wheels. Metal-wheeled pry bars (J-Bars) are not authorized for use on aircraft cargo floors. How much you can load on the pry bars depends on the aircraft, so be sure to check the applicable aircraft TO before using them.

224. Determine shoring requirements

Aircraft floors are sturdy but sometimes not sturdy enough for heavy military equipment. 463L pallets are the same way. Although they can hold up to 250 psi, some equipment exceeds both pallet and aircraft limitations. Sometimes the aircraft ramp is too steep for vehicles with extremely low-ground clearances. Many times, turbulence or abrupt maneuvers on an aircraft cause vehicles to bounce. When this happens or when these types of limitations are exceeded, you must use shoring.

Shoring for weight distribution

Shoring requirements must be determined long before you load the aircraft. If required, shippers provide shoring for their cargo. First, let's go over some terms related to shoring.

Contact area

The contact area is the amount of surface area a piece of cargo contacts the aircraft floor or pallet. It is determined, generally, by measuring the length and width of where the cargo contacts and multiplying those two numbers together. Figure 3-1 shows two pieces of "cargo;" the smaller one has less contact area with the surface of the pallet and has broken through. The larger one has more contact area and can safely rest on the pallet without breaking through.

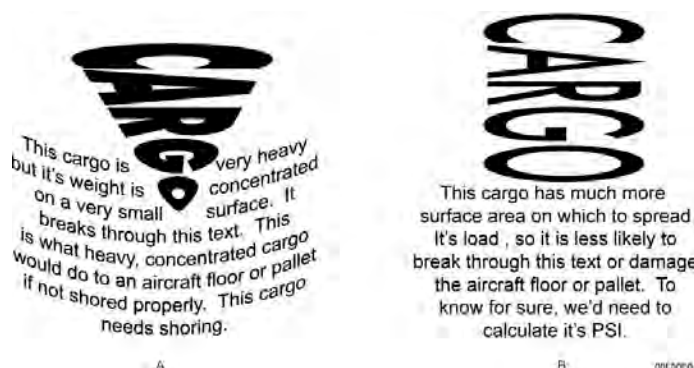


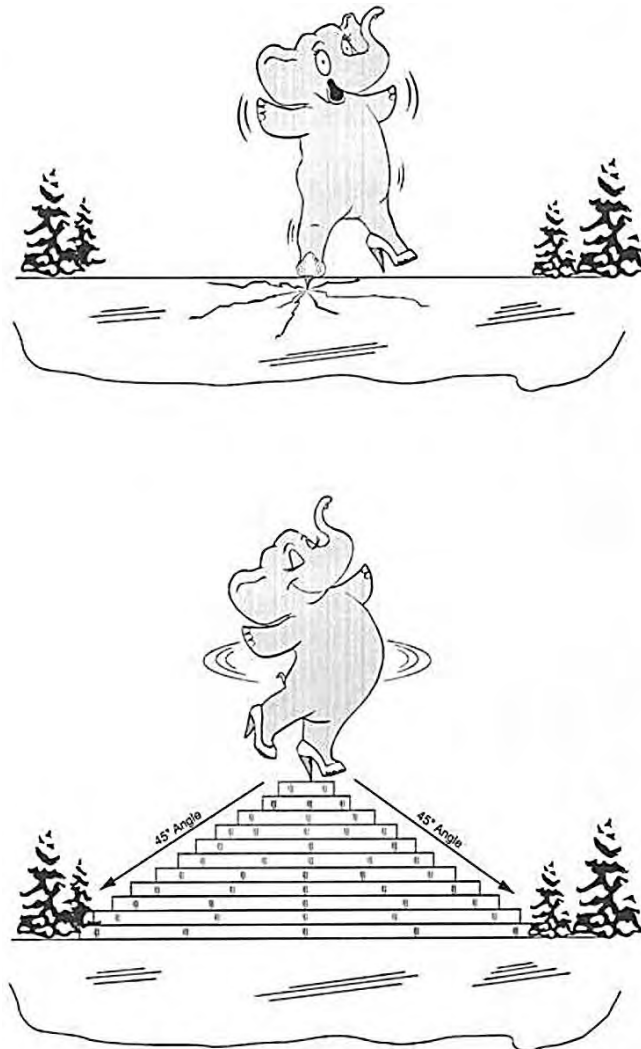
Figure 3-1. Contact area and psi.

Psi

The amount of weight exerted on the aircraft floor or pallet, measured in square inches. If you have two pieces of cargo weighing 5,000 lbs. each, the piece with the least contact area has the highest psi (fig. 3-1). The cargo on the left has the same amount of weight resting on a smaller area so the psi is higher and breaks through the surface. The psi for cargo is determined by dividing the total contact area of the piece into the cargo's weight. We use psi for cargo because the strength of the aircraft floor is measured in pounds per square inch as well. Each aircraft's psi limitations are different.

Some shoring is used to spread weight over a larger floor area; this allows an aircraft to carry a load with a higher weight concentration than normal. Shoring can make the difference between an aircraft carrying or not carrying a load. Do not use 463L pallets as shoring because their construction does not permit load spread.

The weight of a load resting on shoring is spread unequally over the entire area of contact between the shoring and the pallet or aircraft. In general, shoring only increases the area over which a load is distributed out and down at a 45° angle, as shown by the elephant in figure 3-2. This elephant is much too heavy to be dancing on ice in high heels and, without shoring, falls through the ice. However, after you place shoring underneath the elephant, spreading the weight at a 45° angle in all directions, the elephant can dance the night away.



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Figure 3-2. Weight distribution concept.

The spreading effect of simple shoring is the same regardless of the shape of the item. If your shoring is two-inches thick, it increases the weight distribution by two inches all the way around the contact area. For example, if the original contact area is 10-inches long by 10-inches wide, shoring two inches thick increases the contact area to 14-inches long by 14-inches wide. This is because you have an extra two inches on either side of the contact area and both the top and bottom (fig. 3-3).

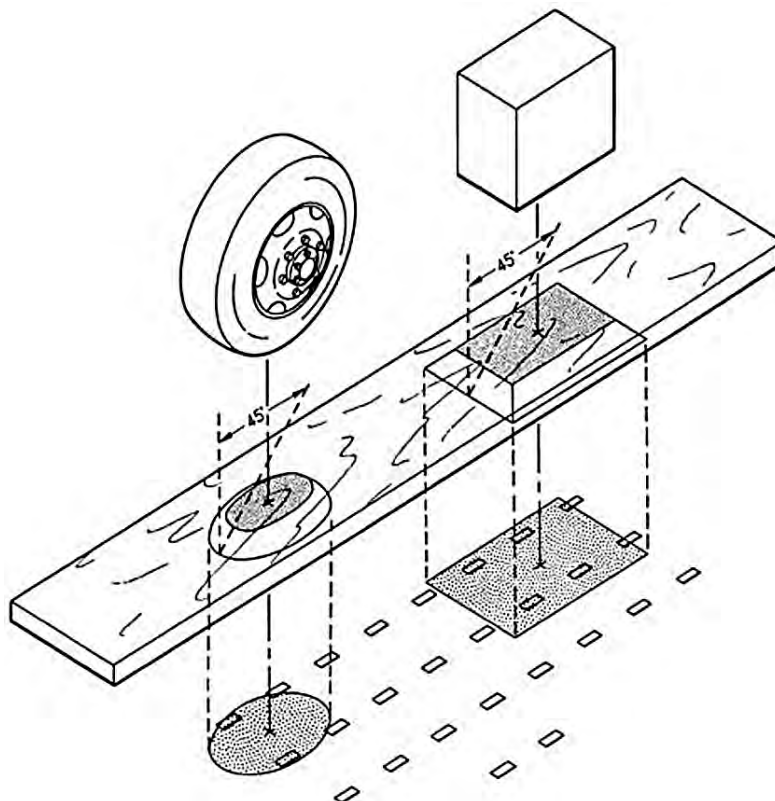


Figure 3-3. Shoring spread effect.

To figure out shoring for weight distribution, you must know where the item will be loaded on the aircraft and what the psi limitation is for that location. You must also know the total contact area for the item being loaded. Determining contact area depends on the type of cargo. The following table illustrates how to determine contact area for various types of cargo.

Determine Contact Area for Various Types of Cargo	
Type	Formula
Square/rectangular cargo	$L \times W$.
Skidded cargo	$L \times W$ (of each skid) \times number of skids. Total those numbers to get the contact area.
Pneumatic tires	$L \times W$ (of each pad) $\times 0.785$. Total those numbers to get the total contact area.
Drum without a rim	Diameter^2 (squared) $\times 0.785$.
Drum with a rim	$\text{Outside-rim diameter}^2$ (squared) $- \text{Inside-rim diameter}^2$ (squared) $\times 0.785$.

Once you determine the total contact area for a piece of cargo, divide the contact area into the weight of the piece to determine the psi. If the psi of the cargo exceeds the psi limitation of the aircraft, you need shoring for this item.

The aircraft floor and pallet are not the only considerations when determining the need for shoring. Each aircraft has a roller conveyor system to help with loading pallets, which you must also consider

when determining the need for shoring. Each aircraft is different and has several factors to consider. Ensure you check the applicable aircraft TO for roller load limitations when determining if a particular item needs shoring.

Floor protection shoring

Shoring is required to protect the aircraft ramps and cargo compartment floors from damage during on/offloading. Shoring is also required to protect compartment floors from tracked vehicles or vehicles with wheels that have lugs, cleats, studs, metal rolling surfaces, or small diameters.

Rolling shoring

Vehicles with cleats, lugs, studs, or other gripping devices on their wheels or treads require rolling shoring. Vehicles with steel-tired wheels and, in some cases, hard-rubber tires or tracks also require rolling shoring. Pneumatic tires with an internal tire pressure of *more than 100 psi* are considered hard-rubber tires. Rolling shoring covers the aircraft floor as a vehicle rolls over it to protect it from damage from these types of items. It is similar to using shoring for weight distribution. Cleated or lugged wheels damage the floor because the weight of the vehicle is carried only on those portions of the wheel. This reduces the contact area, concentrates the load to that smaller area, and increases the psi. Steel wheels and hard-rubber tires or tracks usually concentrate the load of the vehicle and create stresses on the aircraft floor much more than pneumatic wheels.

When using rolling shoring, use shoring at least $\frac{3}{4}$ -inch thick. Cleats and lugs must have shoring thick enough for them to sink into. For steel- and hard-rubber wheels, shoring must be thick enough to spread the weight out sufficiently to not exceed the psi limitations for the aircraft floor.

Parking shoring

Any vehicle that requires rolling shoring also requires parking shoring. Rolling shoring requirements for lugged, cleated, studded, tracked, steel- and hard-wheeled items also apply to parking shoring. Parking shoring spreads the weight of these concentrated loads out so the vehicles do not damage the aircraft floor in flight. However, rolling a vehicle onto a stationary aircraft is different from parking a vehicle on an aircraft during flight when the aircraft is flying at 3Gs. Because of this, in-flight psi requirements are usually more restrictive than requirements during loading and unloading operations. Figure 3-4 shows an example of parking shoring for a tracked vehicle.

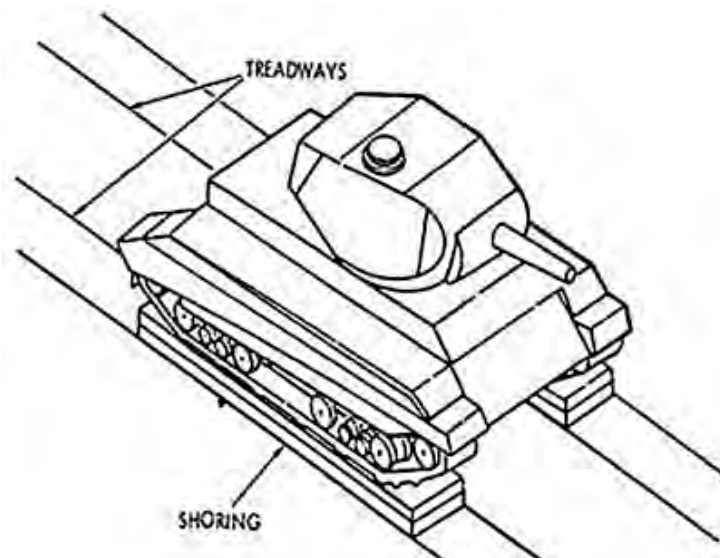
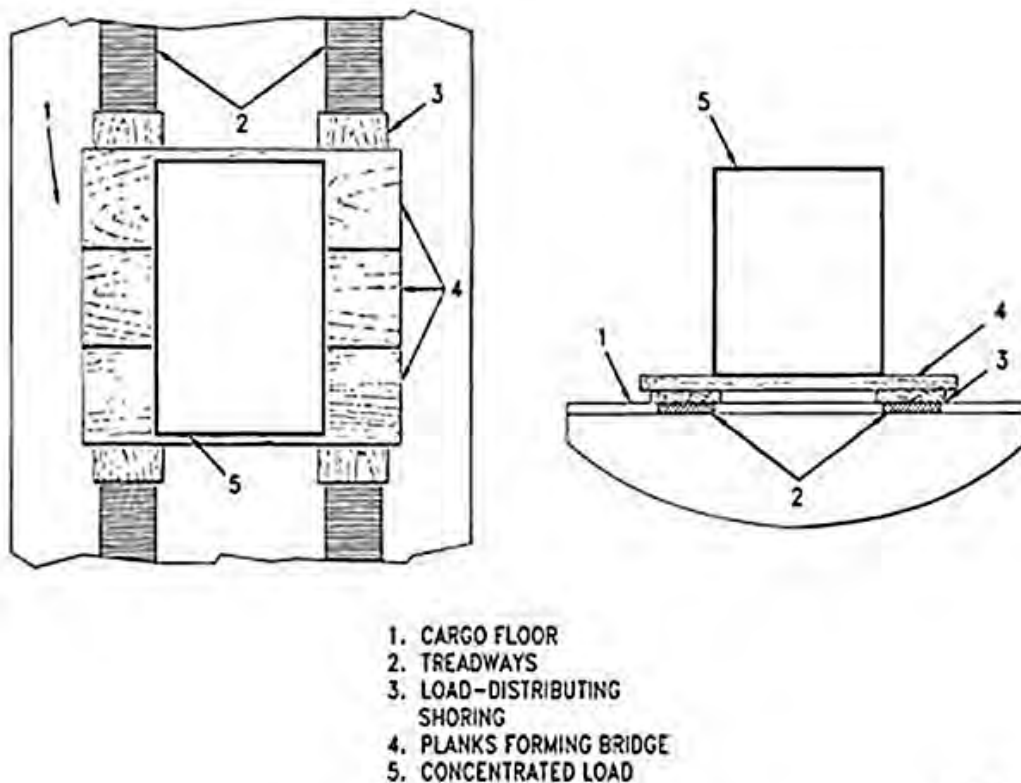


Figure 3-4. Parking shoring.

Bridge shoring (C-130)

Different parts of the aircraft are stronger than other parts (e.g., treadways on the aircraft are stronger than areas between or outside the treadways [fig. 3-5]). Whenever possible, always try to load cargo and rolling stock on the treadways of an aircraft. Sometimes though, it is not possible. Bridge shoring allows heavy cargo to be placed between the treadways on heavy supporting beams that span the floor between the treadways. Position the cargo so the weight is distributed equally on the two treadways. The thickness of the shoring must be enough to ensure all the weight is on the treadways.

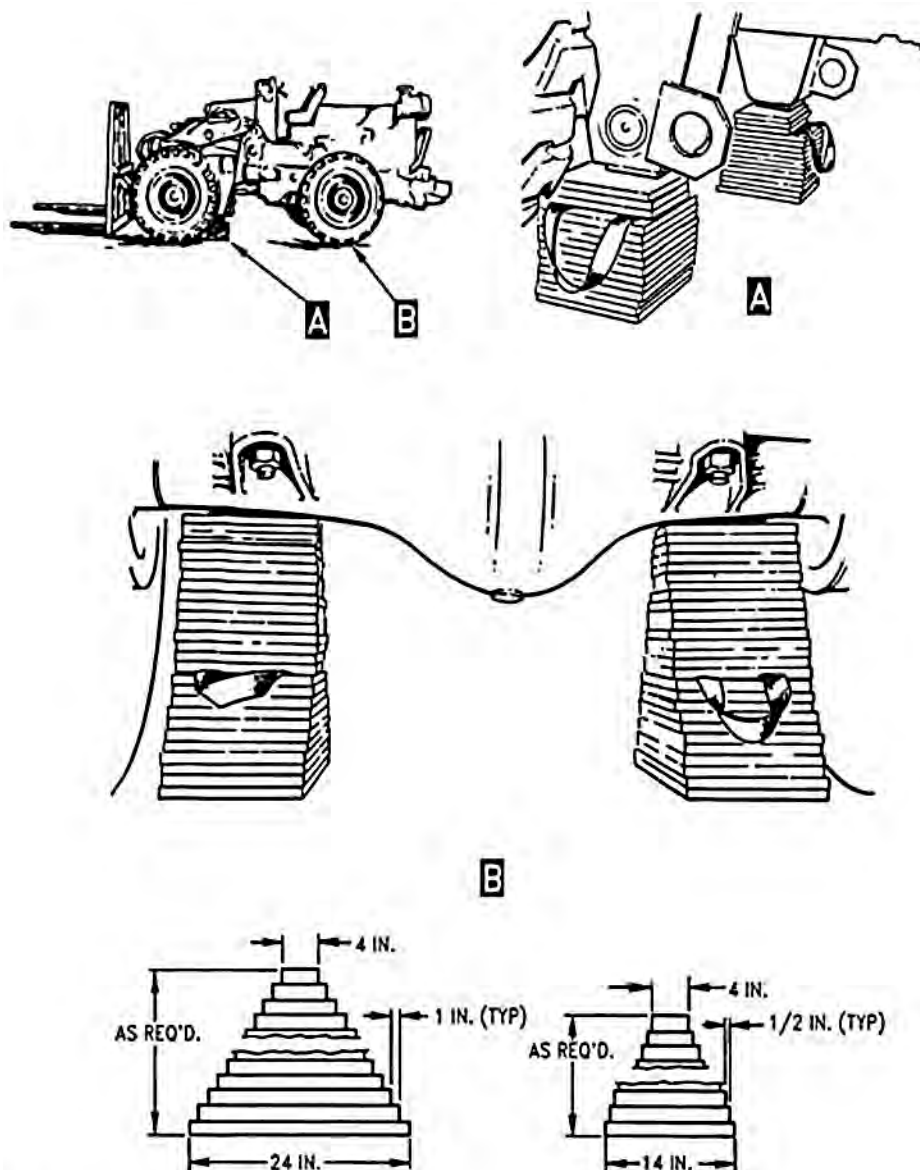


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Figure 3-5. Bridge shoring.

Sleeper shoring

Turbulence or other abrupt or violent movements on an aircraft in flight can affect the cargo's security and stability. Vehicles may bounce or jerk around, placing pressure on pneumatic tires and causing them to compress. When this happens, the vehicle's rims risk contacting the aircraft floor and causing damage to both the floor and the wheels. In addition, when the tires rebound from compression, the chains securing the vehicle pull tight and may jerk or whip. These movements place too much stress on the chains, devices, and tie-down rings on the aircraft and may cause them to fail in-flight. Vehicles over 20,000 lbs. with balloon tires (i.e., some forklifts, scoop loaders, graders, etc.) and spring-mounted vehicles are especially affected by turbulence and abrupt maneuvers. Brace these types using sleeper shoring. Place sleeper shoring under the axle, frame, or chassis of the vehicle. Place sleeper shoring as flush as possible and secure it to the floor so it does not shift in flight. Build sleeper shoring large enough to be able to support the entire weight of the vehicle during turbulence *without exceeding* aircraft floor limitations. Figure 3-6 shows an example of sleeper shoring under a 10K all-terrain (AT) forklift.

**NOTE**

SHORING MAY BE TIERED FOR EASE OF PLACEMENT. MINIMUM LENGTHS FOR TOP AND BOTTOM LAYERS WILL BE AS SHOWN. MINIMUM WIDTH OF SHORING WILL BE 11 INCHES.

Figure 3-6. Sleeper shoring.

Approach and step-up shoring

Use approach shoring to *reduce the ramp angle* a vehicle must travel during on/offloading. Use step-up shoring to *decrease the vehicle projection angle and/or increase the ground clearance* of a particular vehicle. They each operate on the same concept. When loading vehicles from the ground onto the aircraft, ensure no part of the vehicle comes in contact with the aircraft (fig. 3-7). Some vehicles have so much height, moving them up a ramp can cause the top portions to contact the aircraft (fig. 3-7). Some vehicles are so long or low to the ground, the bottom of the vehicle can contact the ramp, ramp crest, or ground (fig. 3-8). In addition, if any vehicle has long forward or aft overhang, the risk of contacting the aircraft increases. Each aircraft and vehicle is different, but to determine if you need approach or step-up shoring, you need some critical information (i.e., the height of the vehicle, the

wheelbase or critical dimension, forward and aft overhang, and ground clearance). You also need to know the ramp angle and the height of the ramp crest.

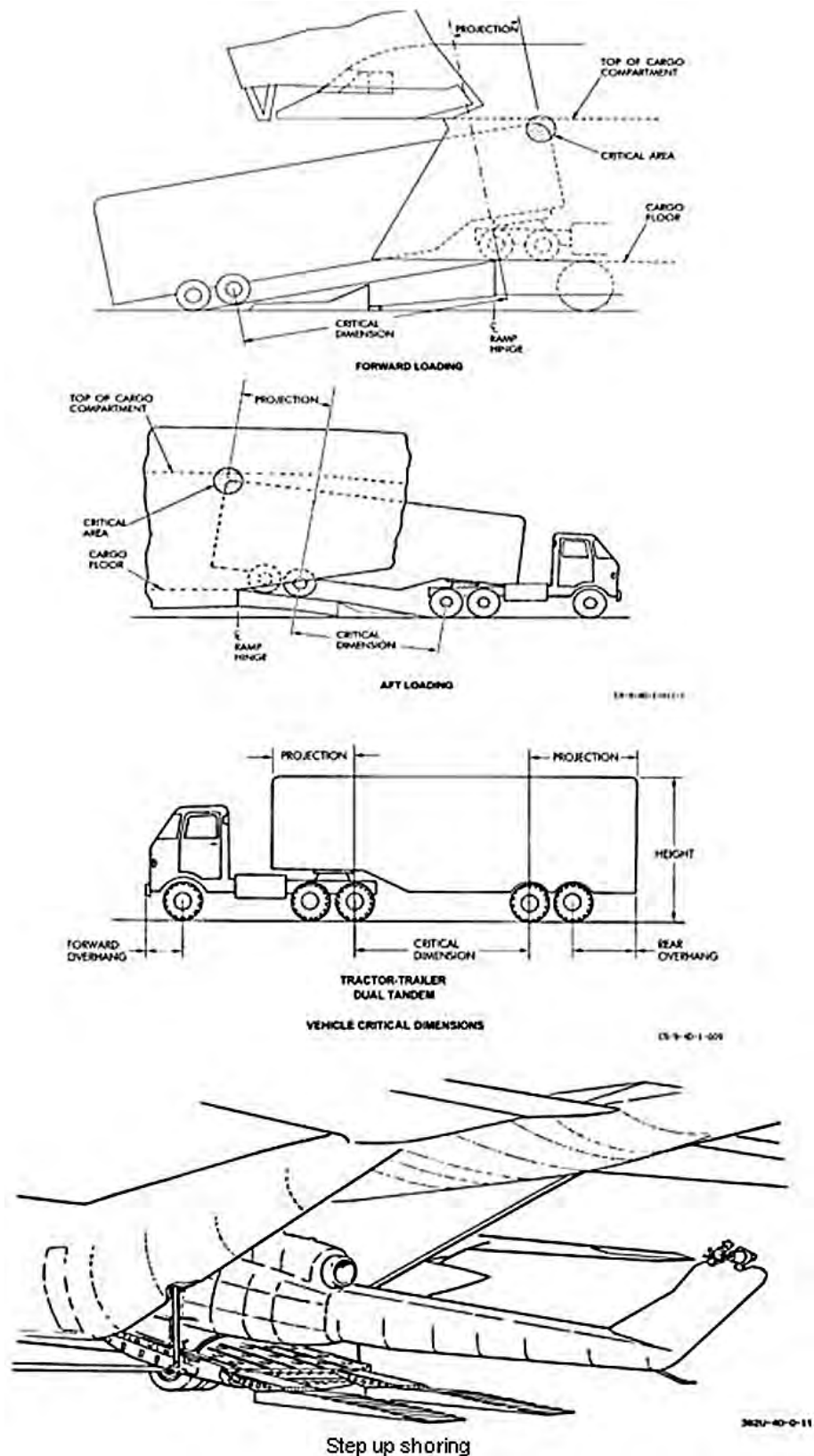


Figure 3-7. Projection.

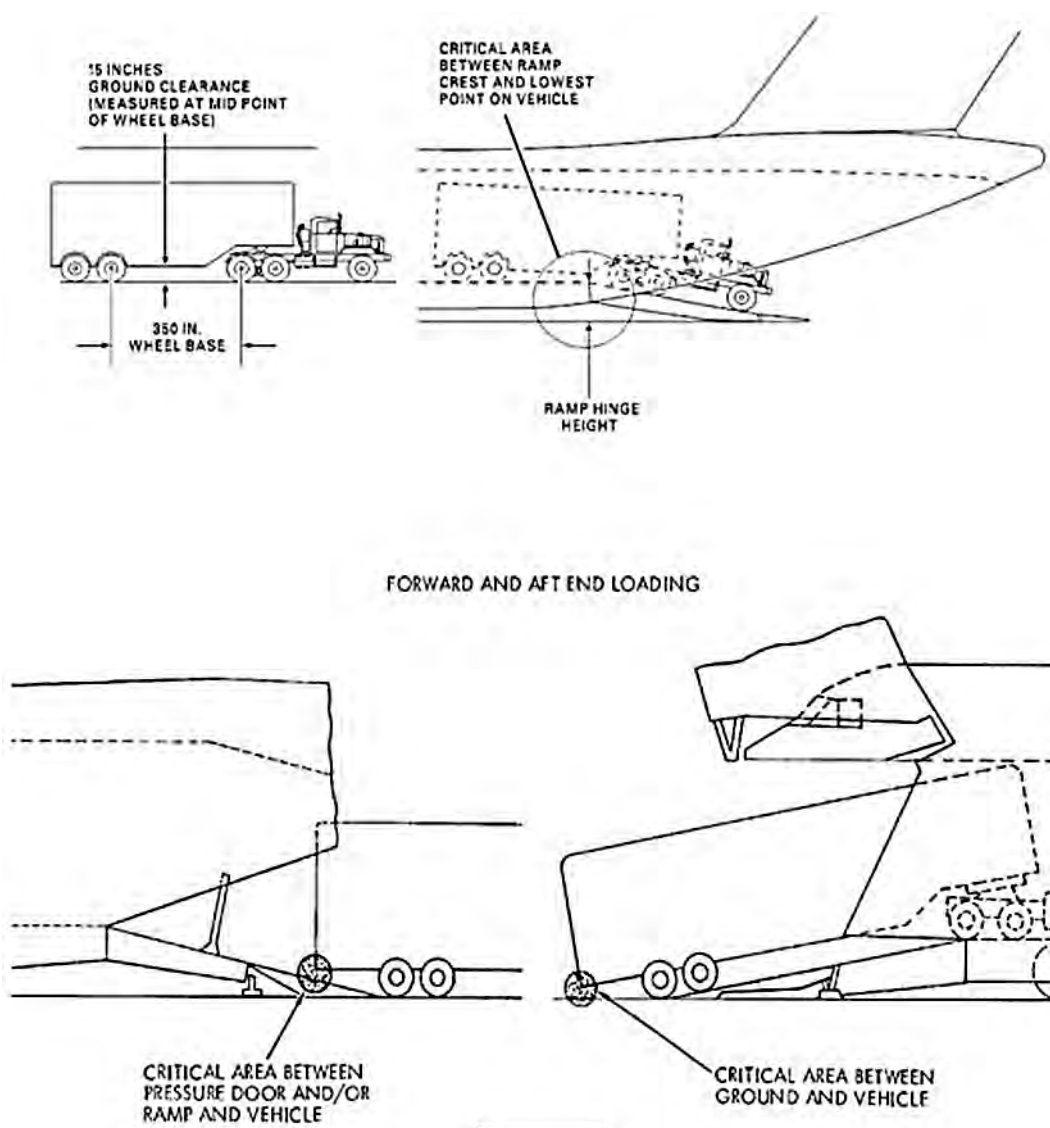


Figure 3-8. Ramp contact.

225. Set-up cargo/mail/baggage for loading

Before you ever set foot on the aircraft to load it, you must pull, assemble, set up the load, plan which equipment you will use to load the aircraft, and transport the load to the aircraft following appropriate safety procedures. In addition, the aircraft must be properly prepared to accept the load.

When pulling and assembling the load, ensure you are using the appropriate personal protective equipment (PPE). If driving a vehicle or MHE, ensure you have your state and government driver's license or AF Form 171, Request for Driver's Training and Addition to US Government Driver's License, on your person. If performing flight-line operations, make sure you also have your flight-line competency card.

When performing aircraft services duties, you are responsible for ensuring all manifested cargo and mail is loaded and offloaded as required. The special handling section is *only responsible* for on or offloading loose shipments of "life or death urgency" material, AMC MICAP/VVIP, and registered mail. Working on a load crew, you assemble and inspect all planned loads for pilferage and movement readiness. You also load aircraft using an AF Form 4080, Load Sequence Breakdown Worksheet (load plan), or Integrated Computerized Deployment System (ICODES) load plan. If

changes occur during assembly or loading, annotate those changes on a copy of the AF Form 4080/ICODES load plan and forward to the ATOC shift supervisor. Load team chiefs brief load teams about unique load characteristics, safety procedures, and loading operations *prior to actual load or offload* (e.g., explosives, HAZMAT, vehicles, and outsize cargo).

Once you receive the AF Form 4080 or ICODES, you can pull and assemble the load. As you pull each pallet or loose shipment from the storage areas, make sure the ID on the pallet matches the pallet ID on the load plan. Also, ensure the destination and weight match as well. For loose shipments, verify the TCN on the label to the TCN on the load plan or loose cargo pull sheet. Arrange the load on the appropriate K-loader, highline dock, or staging area in order according to the load plan or pull sheet.

As you are pulling the cargo, inspect it for discrepancies, such as damage, cleanliness, pilferage, improper tie-down, or improper documentation. Remove all snow, ice, and standing water from the pallets prior to loading them on an aircraft. This is the last inspection the cargo will receive before arriving at the aircraft, so make sure it is thorough; correct any discrepancies. If you are unable to correct any item, notify load planning immediately. If you find any unfixable discrepancy (due to time restraints) during the inspection, notify load planning, so they can replace the item to achieve maximum aircraft utilization.

Double-check the sequence. Verify the load is set up appropriately for the type of aircraft and configuration. For example, the C-17 has two different configurations (aerial delivery system [ADS] or LGS), which can affect how pallets are loaded on K-loaders. Once loading operations start, it is time-consuming to shift loads.

226. Prepare aircraft for loading

Before any loading operations begin, the aircraft must be ready to accept the load. Preparing the aircraft for loading is a responsibility shared by the aircrew and you. Coordinate with the loadmaster and help configure the aircraft where applicable. As a load team chief or as a load team member, you are the liaison or expert on the load type; it is your responsibility to be familiar with the load plan. This will determine how you configure the aircraft.

Each aircraft can be configured in different ways, depending on the mission and load type. The AFI 11-2C-series publications outline the various configurations for each aircraft. It is important to know how to read a load plan to know how to position the aircraft and configure the cargo. Chock aircraft to begin on/offload procedures.

The agency performing services on the aircraft is responsible for installing or stowing required equipment according to the aircraft TOs. For example, if the aircraft requires patient litters for AE, the maintenance teams will install the equipment. The load team, under the direction of the load team chief, assists the loadmaster/boom operator in preparing the aircraft for loading. Prior to aircraft loading, the load team chief also performs a pre-inspection of cargo loads, the aircraft cargo compartment, and aircraft loading aids.

After determining the shoring requirements for your load, pre-position the shoring at the aircraft to save loading time. Some shoring must be assembled a certain way before loading begins. This could take time, so it is best to ensure you have all the pieces and assemble them properly before loading begins.

Kneeling and cargo doors

Aircraft like the C-5 can be knelt in various positions to accommodate certain types of cargo. Knowing the requirements of the cargo on the load plan helps you determine in which position the aircraft should be knelt (forward, aft, level) or whether rolling stock will be driven on/off from the K-loader or from the ground. In addition, the C-5 and the AN-124 each have the capability to be loaded from either the aft or forward cargo doors. The height and characteristics of the cargo load determines through which door it is loaded. It can take some time to kneel an aircraft and open the

various doors, so knowing and communicating those requirements in advance helps save time and eases on/offload procedures.

Rollers, locks, and rails

Use rollers to move pallets easily within an aircraft. When loading pallets, rollers must be facing up. When loading rolling stock, flip rollers down to avoid getting in the way. Uninstall and store the rollers elsewhere on a C-130E/H aircraft. On the C-5, C-130J, and C-17, the rollers can be flipped down. This can take some time to do depending on the load, so it is important to know and communicate the configuration requirements to the appropriate agency.

Each aircraft has pallet locks that must be released before loading operations start. This removes them from the way of loading personnel. Failing to release the pallet locks may cause the pallet to stop suddenly during loading operations and damage the aircraft rail system or injure load team members. Never use pallet locks as pallet stops.

Restraint rails guide pallets into position and keep them in place when they are in position. On any aircraft, when pallets are in position and locked, the pallet locks and restraint rails provide sufficient restraint for pallets in all directions.

Tie-down rings and fittings

Each aircraft cargo floor has tie-down rings or fittings for securing cargo at various locations throughout; these fittings are rated at either 10,000 or 25,000 lbs., depending on the aircraft (fig. 3-9).

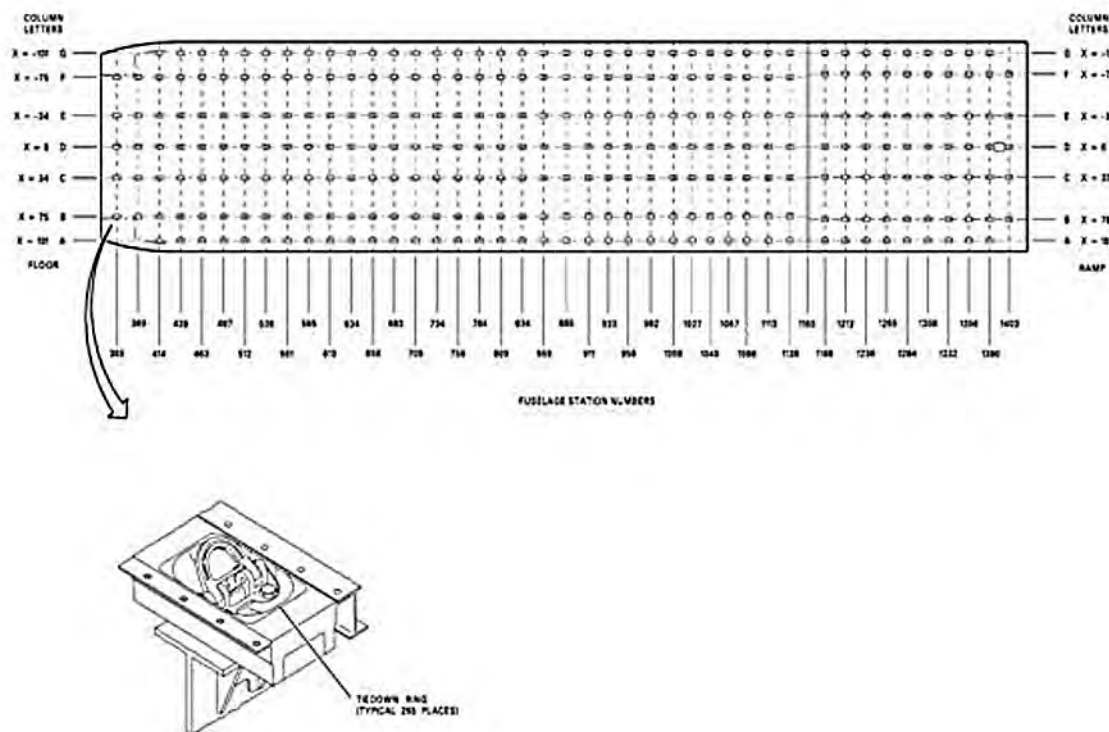


Figure 3-9. Tie-down grid and ring.

The C-17 contains 295 tie-down rings in the cargo compartment floor and ramp. The rings are arranged in seven columns in a grid pattern providing maximum flexibility for cargo restraint and tie-down for a large variety of cargo loads. Each tie-down ring is mounted in a pan recessed in the cargo floor. The tie-down rings are capable of withstanding a 25,000-lb. rated strength. The C-5 contains 304 of the same type of rings in seven columns as well, but in some places, they are irregularly spaced.

On a C-130, the cargo floor contains 175 10,000-lb. rings in seven columns, patterned approximately 20-inches apart. Just like the C-17 and C-5, when not in use, the rings rest in the recesses just deep enough to keep them out of the way. The ramp of most C-130s contains seven columns of 5,000-lb. rings. Most C-130s also contain 12 sockets for 25,000-lb. capacity fittings. Basically, the socket is a hole in the floor that is plugged when not in use. Metal fittings with attached rings are installed into the sockets when they are needed and stored when not in use. Figure 3-10 shows a grid of the arrangement of the tie-down rings and fittings on the aircraft.

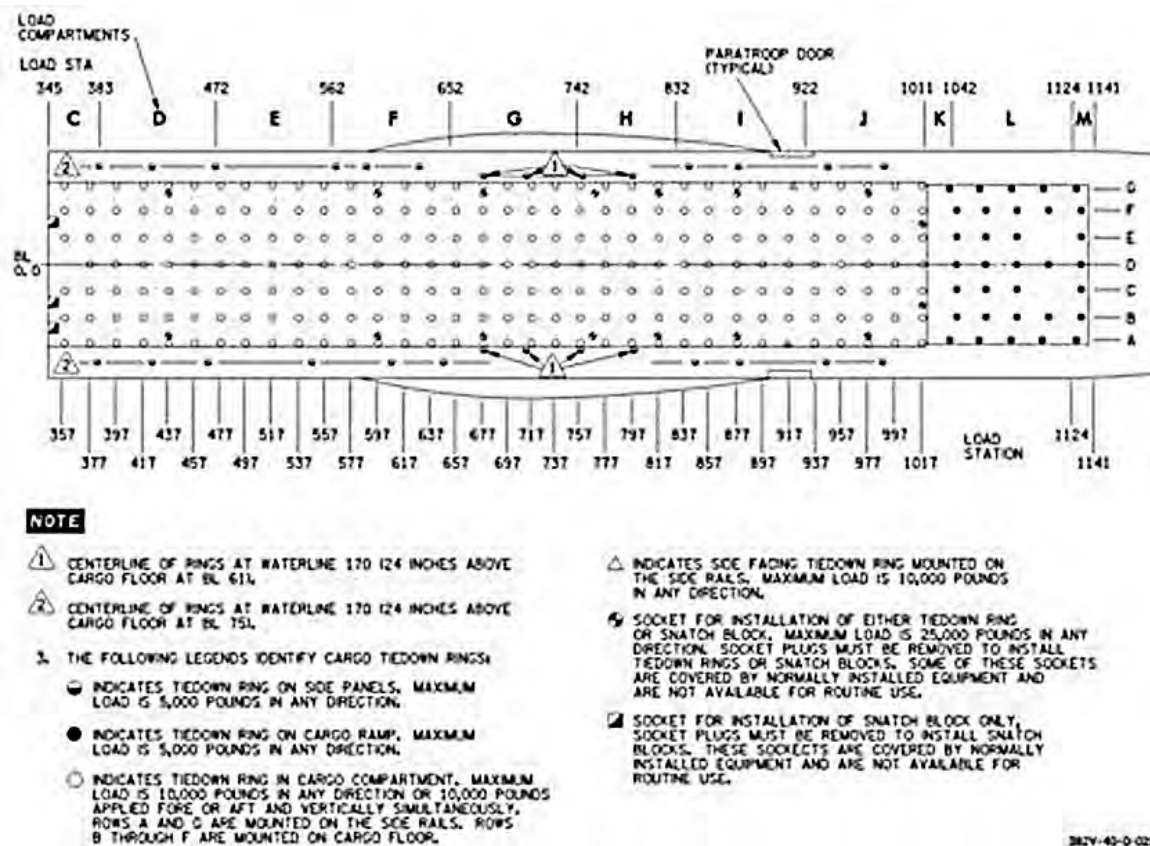


Figure 3-10. C-130J tie-down ring locations.

You do not necessarily have to prepare the aircraft for using the pallet rings unless you are using the 25,000-lb. tie-down fittings on the C-130; in this case, install the rings into the sockets. The other type of rings requires no preparation.

Auxiliary equipment

Some loads require additional equipment that may need to be set up or positioned, depending on the type of load and aircraft. The use of these features can make loading easier. Most of these auxiliary items do not require much set-up time, but if they can be set up in advance before loading operations begin, it will reduce on/offload times. Sometimes, cargo loads have so many different types of requirements, these items must be set up and/or removed during on/offload operations.

Ramps and extensions

Some aircraft have ramps that can be hydraulically lifted and lowered to accommodate different types of loads. The lifting capability of the C-17 ramp can eliminate most types of cargo projection problems and ramp crest issues. This ramp is also equipped with a set of four adjustable and removable hydraulic toes. The toes form a bridge between the ground and the ramp when loading

wheeled items and between the ramp and K-loader for straight-in loading of palletized or wheeled cargo. Install rollers and guide rails on the ramp toes when necessary.

To load rolling stock from the ground, the C-130 comes with two nonskid auxiliary ground loading ramps. They can withstand 6,500 lbs. per wheel or 13,000 lbs. per axle. The C-130 also has auxiliary truck loading ramps that can bridge the K-loader and aircraft ramp to load vehicles from a K-loader (fig. 3-11).

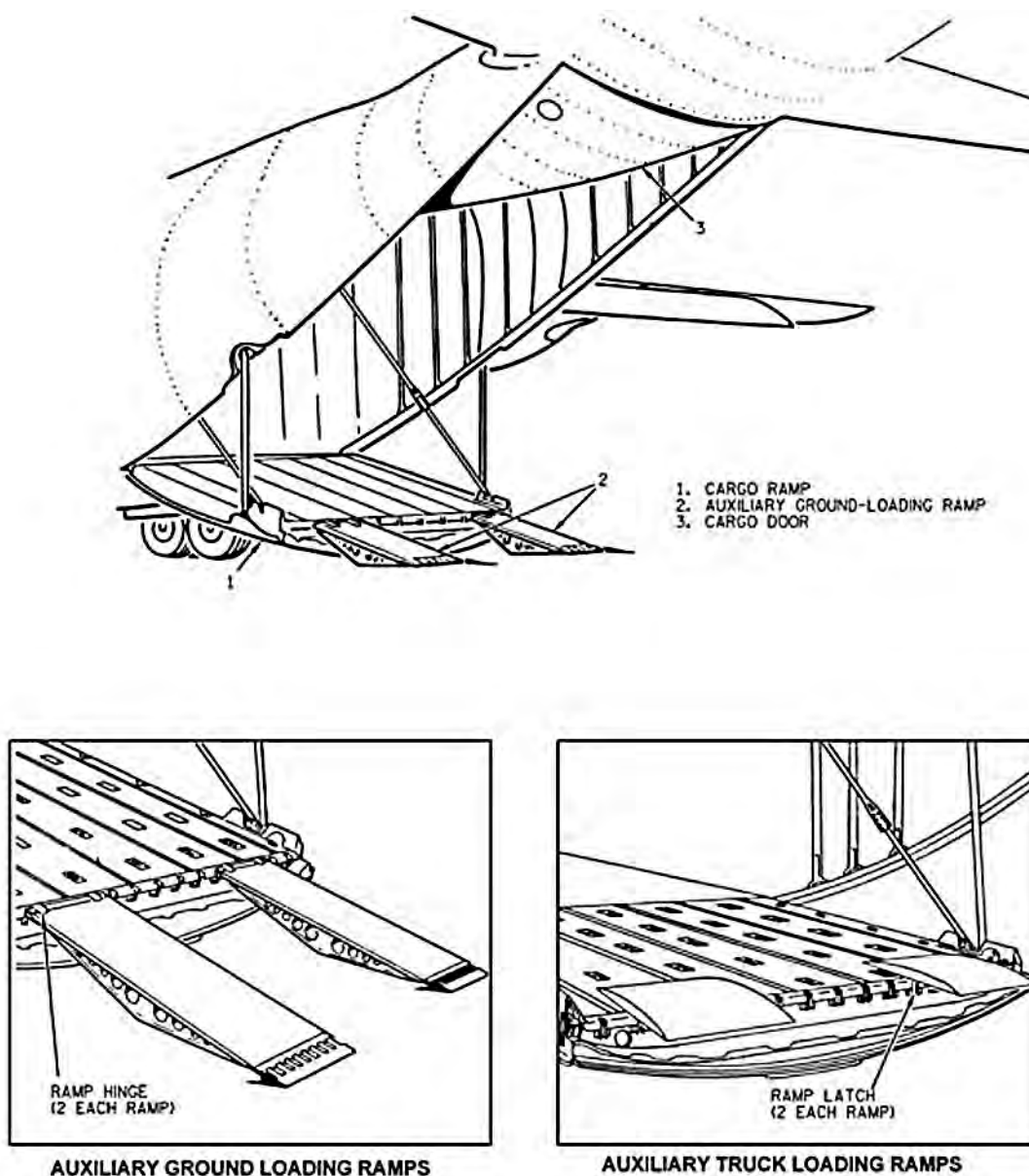


Figure 3-11. C-130 auxiliary loading ramps.

Stability and support equipment

Two stabilizer struts are provided on both C-5 and the C-17 (one on each side of the aft fuselage) for stabilization of the aircraft during on/offloading operations. The use of stabilizer struts depends on the cargo ramp configuration and weight of the cargo being loaded. The C-130 uses a ramp support platform made of either metal or wood (called a milk stool). This ramp support platform, or milk stool, placed under the ramp provides support for on/offloading operations (fig. 3-12).

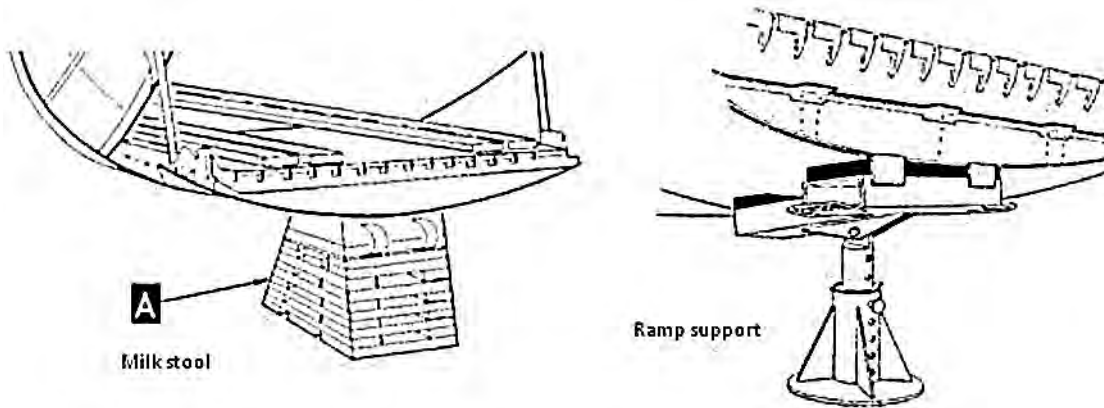


Figure 3-12. C-130 ramp support equipment.

Cargo winch and snatch block

Some aircraft also have equipment to help pull palletized or skidded cargo and vehicles into the aircraft. The cargo winch is a hydraulically- or electrically-operated cable used to pull cargo slowly into the aircraft when it cannot be pushed or driven onto the aircraft. Use snatch blocks with the cargo winch to redirect the cable pull to adapt to the various modes of the winch operation. Loadmasters can attach each snatch block to any tie-down ring on the aircraft, depending on which direction the cargo needs to go. C-5s have three snatch blocks onboard, each with a 15,000-lb. capacity; C-17s have four onboard, each with a 20,000-lb. capacity; and C-130s have two onboard, each with a 13,000-lb. capacity.

Other equipment

You may also use steel- or aluminum-bridge plates to bridge the gap between the aircraft and K-loader when loading wheeled cargo. The bridge plates are stored on the K-loader when not in use. The maximum load on each bridge plate will not exceed 7,500 lbs. or 15,000 lbs. total for both.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

223. Select loading equipment

1. What factors must you consider when selecting loading equipment?
2. What *must* you consider when determining the size of your load team?
3. When can you use a forklift with bare tines to load/offload an aircraft?

224. Determine shoring requirements

1. What is the formula for determining the contact area of a square or rectangular piece of cargo?
2. Which items require rolling shoring?
3. At which psi are pneumatic tires considered hard-rubber tires?
4. When an item has rolling shoring, what other type of shoring is required?
5. What is the purpose of bridge shoring?
6. Which type of items require sleeper shoring?
7. Describe how to place sleeper shoring under the axle, frame, or chassis of a vehicle.
8. What is the purpose of approach shoring?

225. Set-up cargo/mail/baggage for loading

1. When pulling and assembling the load, what information must you match to the load plan?
2. As you are pulling the cargo, what must you inspect?

226. Prepare aircraft for loading

1. How much weight can the auxiliary ground loading ramps of a C-130 withstand?
2. How is stability and support provided on a C-130 ramp?
3. A cargo winch is used for what purpose?
4. A snatch block is used for what purpose?

3-2. Loading Operations

You have prepared everything you can to load the aircraft up until this point. In this section, we discuss loading procedures; how to operate safely around aircraft; and how to secure the cargo aboard the aircraft safely and efficiently. We also discuss special loading procedures, such as engine running on/offloads (ERO) and concurrent servicing.

227. Performing flight-line safety and ground spotter duties

Operating vehicles around aircraft can be a risky business. You must be mindful of the hazards associated with these types of operations, such as engine blast damage, cargo handling mishaps, unsafe personal actions, and foreign object damage (FOD). Because of these risks, you must follow sound safety practices, be situationally aware of what is going on around you, and constantly pay attention to what you are doing.

There are three zones in relation to an aircraft circle of safety: a spotter zone, a clear zone, and an engine operations zone. The *spotter zone* is any area within 10 feet (ft.) of the aircraft. Any vehicles or equipment operating within the spotter zone requires a spotter at all times. The *clear zone* is the zone outside the circle of safety.

The *engine operations zone* includes the area 25 ft. in front and 200 ft. behind an aircraft. When aircraft engines are running or about to start, no vehicle is allowed to park or drive in this area. There are exceptions, during ERO operations, which we will talk about in a later lesson. Do not back or park any vehicle in the engine operations zone of any aircraft, except as authorized for operations, such as loading or unloading, servicing, or towing.

K-loaders *must stop at least 10 ft. from aircraft for preliminary alignment*. For minor adjustments during onloading, K-loaders maintain approximately 4–8 inches clearance between the rubber bumpers and the aircraft. Forklifts also maintain 4–8 inches from the front of the fork tines and the aircraft.

Never drive a forklift under any part of an aircraft *except* when the type of aircraft involved requires it.

Chocking

Use chocks any time a vehicle is within 10 ft. of an aircraft. One person, designated as a chocker, pre-positions the chocks to prepare for the vehicle approaching and when the vehicle is in place, adjusts the chock as necessary to ensure the vehicle does not hit the aircraft during loading operations. Since each cargo-loading vehicle has different front- and rear-end clearances, chockers must watch and be aware of distances between the vehicle and aircraft (or docks).

Vehicle operators are responsible for ensuring their vehicle has the required chocks. Spotters cannot spot a vehicle and perform chocking duties at the same time; two people are required. However, the load team chief and spotter are responsible for enforcing chocking procedures during on/offloads.

Spotting vehicle operators

Spotters must *first* ensure they have all PPE and other safety equipment. Required safety equipment can include steel-toed boots, gloves, hearing protection, and a reflective belt and night wands for night operations or during inclement weather.

Vehicle operators *first* ensure required spotters are in place before moving the vehicle and will not move the vehicle within 10 ft. of the aircraft unless assisted by a spotter. As a vehicle operator, you must never attempt to judge clearances on your own. Spotters are required anytime there is limited or restricted visibility and anytime vehicles operate within 10 ft. of an aircraft. Spotters also are required anytime a 60K-loader is within 15 ft. of any stationary object, including vehicles, buildings, and aircraft. Station guides inside and outside the aircraft to monitor clearances of outsized and oversized cargo.

If using K-loaders without deck extensions to on/offload lower-lobe aircraft compartments, then normally you back them into the aircraft. Before attempting to back a K-loader, the vehicle operator must ensure the primary spotter is clearly in view and signals are understood. Use the pre-positioned wheel chocks to prevent vehicles from being backed into the aircraft. Accurate preliminary height adjustment of the loader deck is critical in lower-lobe operations. The vehicle operator stops the K-loader approximately 10 ft. from the aircraft for this preliminary height adjustment. Load crew personnel must exercise extreme caution when approaching and stepping over the gap between the loader deck and aircraft floor as this gap is much greater than in other loading operations. Due to the fuselage contour of these aircraft, use extreme care when positioning equipment for on/offload operations.

Next, position spotters so they are visible always to the vehicle operator. However, they cannot stand directly in between or in the path of a vehicle. Most of the time, only one spotter is necessary, but if operations require the use of two or more spotters, one will be designated as the primary spotter with overall responsibility for the operation. The vehicle operator will follow *only* the primary spotter's signals.

Operations stop anytime there are clearance problems or the vehicle operator loses visual contact with the primary spotter. Standard spotter signals were developed to eliminate confusion; however, anytime the vehicle operator is unclear of the signal, he or she will stop operations and clarify the signal with the spotter. There is no room for miscommunication during vehicle operations. Miscommunication can harm people and damage aircraft, equipment, and cargo.

Keep in mind these spotting signals are not just limited to working around aircraft. You must use these signals anytime a vehicle operator has limited or restricted visibility, which may be inside a warehouse or anywhere else.

Spotting is simply communication between the vehicle operator and the spotter. The spotter must communicate using hand and arm signals to the vehicle operator. Spotters must make sure operators understand the signals, and operators must ensure they understand the signals.

You must use standardized spotting signals to communicate to the vehicle operator. Failure to do so could result in miscommunication between you and the driver and potentially damage an aircraft, equipment, or cargo. You could also put people's lives at risk!

Once the spotter has all-required PPE and is positioned properly, the chocker is in place with the chock, and the load team and loadmaster are ready, the vehicle operator can then follow the signals the spotter communicates. It is important to perform these signals sharply with each required movement illustrated in the figures to make sure the driver understands them. Eliminating even one portion of the movement or performing them sloppily can increase misunderstandings and your chance of an accident.

Let's break these spotting signals into three categories: general signals, signals used for forklifts, and signals used for K-loaders. Spotting signals are the same for nighttime operations, except you must use light wands so the operator can see what you are communicating.

General spotting signals

General spotting signals apply to every vehicle. Each description of figures 3-13 through 3-20 illustrates the various spotter signals.



Forward

Bend both elbows, palms or night wands facing up. In unison, move forearms forward. Signal either above your head, or to the sides of your body to ensure hand movements are clearly seen!

Back Up

Extend both arms downward with palms facing away or wands pointing down. In unison, move arms forward and back. At no time should your hands be above waist height. Repeat this movement until you want the driver to stop. NOTE: Picture shows motion only. Proper position should be facing the driver!



Slow Down

Raise both arms, bend elbows. Position palms or wands facing down, in front of body. Move both hands or wands in an up and down motion.

Figure 3-13. Forward, back up, and slow down.



Right Turn

Raise your left arm or wand, pointing to the left. Raise right arm and bend elbow. Hand or wand will be pointing up. Motion right hand or wand left and right.

Left Turn

Raise your right arm or wand, pointing to the right. Raise left arm and bend elbow. Hand or wand will be pointing up. Motion left hand or wand right and left.



Stop

Extend and raise both arms. Cross arms or wands in front of body.



Shut Down

Position palm or wand facing down, horizontally across your neck. Move your hand, or wand in a sweeping motion from left to right.



Figure 3-14. Right and left turn, stop, and shut down.

Forklift spotting signals

Some signals are unique to forklift operations (figs. 3-15 and 3-16). The spotter must use extra caution when spotting 10K AT forklifts. When guiding operators, never stand in between or directly in the path of the AT front and rear tires.



Close Fork Tines

Bend elbows and point your thumbs or wands at each other. Move thumbs or wands toward each other repeatedly.



Open Fork Tines

Bend elbows and point your thumbs, or wands, away from each other. Move thumbs or wands away from each other repeatedly.



Side Shift Right

Bend elbows, with hands closed or holding wands, point thumbs or wands to the left and motion side to side.



Side Shift Left

Bend elbows, with hands closed or holding wands, point thumbs or wands to the right and motion side to side.

Figure 3-15. Close and open tines; side shift right and left.

Raise Carriage

Bend elbows and point your thumbs or wands in the up position, and motion up and down.



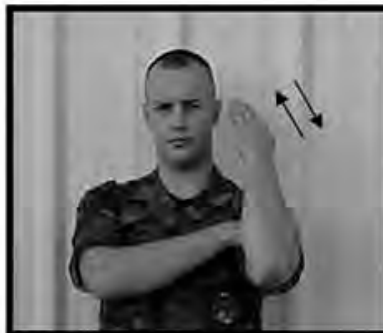
Lower Carriage

Bend elbows and point your thumbs or wands in the down position, and motion up and down.



Tilt Mast Forward

Bend one elbow, palm or wand facing out. Place your other arm or wand across your chest, as shown in picture. Move your forearm or wand up and down away from chest.



Tilt Mast Back

Bend one elbow, palm or wand facing in. Place your other arm across your chest, as shown in picture. Move your forearm or wand up and down towards chest.

Figure 3-16. Raise and lower carriage; tilt mast forward and back.

K-loader spotting signals

With the various functions K-loaders can perform, there are several spotting signals for each movement. Let's go over the signals that apply to all K-loaders first (fig. 3-17) and then 60K-loader-specific signals (figs. 3-18 and 3-19).



Raise Entire Deck

Bend elbows, point thumbs or wands in the up position and motion up and down.



Lower Entire Deck

Bend elbows, point thumbs or wands in the down position, and motion up and down.

Side Shift Right (entire deck)

Bend elbows, with hands closed or holding wands, point thumbs or wands to the left and motion side to side.



Side Shift Left (entire deck)

Bend elbows, with hands closed or holding wands, point thumbs or wands to the right and motion, side to side.



Figure 3-17. Raise, lower, and side shift entire deck.



Raise Front Only (pitch)

Place left hand or wand in the center of your chest. Extend right hand and point upward with your thumb or wand.



Lower Front Only (pitch)

Place left hand or wand in the center of your chest. Extend your right hand and point downward with your thumb or wand.

Raise Rear Only (pitch)

Place your left hand or wand behind your back (in a manner that clearly indicates your back). Extend your right hand and point upward with your thumb or wand.



Lower Rear Only (pitch)

Place your left hand or wand behind your back (in a manner that clearly indicates your back). Extend your right hand and point downward with your thumb or wand.



Figure 3-18. Pitch.



Roll Deck Right

Bend elbows, point left thumb or wand down and right thumb or wand up. Move your hands up and down (alternating).



Roll Deck Left

Bend elbows, point left thumb or wand up and right thumb or wand down. Move your hands up and down (alternating).

Figure 3-19. Roll.

The 60K-loader is the only loader with the capability to yaw. These spotter signals are specifically for that movement (fig. 3-20).



Front Left (yaw)

Place left hand or wand in center of chest. Extend right hand and point to the right with your thumb or wand. Motion right arm or wand side to side.



Front Right (yaw)

Place left hand or wand in center of chest. Extend right hand and point to the left with your thumb or wand. Motion right arm or wand side to side.

Rear Left (yaw)

Place your left hand or wand behind your back (in a manner that clearly indicates your back). Extend your right hand and point to the left with your thumb or wand. Motion your right arm, or wand side to side.



Rear Right (yaw)

Place your left hand or wand behind your back (in a manner that clearly indicates your back). Extend your right hand and point to the right with your thumb or wand. Motion your right arm, or wand, side to side.



Figure 3-20. Yaw.

228. Transporting/securing aircraft loads

As a vehicle operator, you must know where you are taking your load, so verify the correct aircraft type, tail number, and parking spot. For loads requiring more than one K-loader or forklift, ensure you know where your load falls in the sequence of loading.

Secure the cargo to the loading vehicles before transporting. On K-loaders, secure rolling stock to the deck both forward and aft using chains and devices. If the rolling stock is equipped with an integral braking system, engage it. Do not move rolling stock from a K-loader until the loader has come to a

complete stop. When offloading single-axle rolling stock, use at least one forward and one aft tie-down device to restrain the rolling stock until secured to a prime mover or positioned/controlled by a load team. Also, ensure the tie-down is tight and there are no chains or straps dangling from the vehicle. This prevents tie-down equipment from wrapping around an axle and causing damage to the loader, tie-down, and cargo (fig. 3-21).



Figure 3-21. Damaged 60K.

Secure pallets to the K-loader deck using all pallet locks and forward and aft emergency pallet stops and supplemental restraint, if necessary. In AMC, when pallets are loaded on K-loaders logistically, secure the first and last pallet with two 10,000-lbs. chains and devices or HQ AMC-approved restraint. Secure the middle pallets with 5,000-lbs. straps (bellybands) restricting movement in all directions. This is called the “patriot method” (fig. 3-22). Regardless of the method used for restraining cargo, ensure pallet stops are up and pallet locks are engaged.

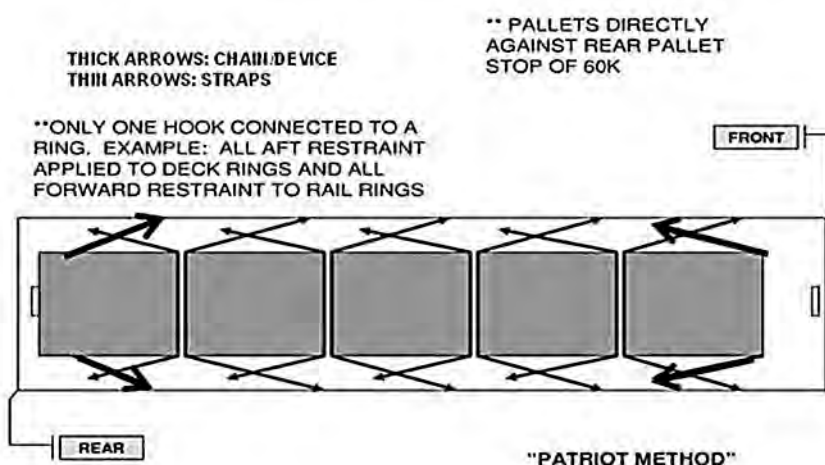


Figure 3-22. Patriot method.

Do not transport pallet trains that exceed K-loader length capacity or pallet trains with overhang that prevents engaging both fore and aft emergency pallet stops. If pallet-handling limitations of a K-loader must be exceeded, the ATM, air freight officer/superintendent, or ATOC senior

controller/duty officer conducts and approves an operational risk assessment (ORA). The ORA provides specific guidance concerning placement of the pallet train on the loader and ensures down line stations are notified of special loading requirements. Use supplemental restraint and spotters and take every safety precaution necessary to ensure safe transport of the item. If a loading situation occurs in which cargo overhang is a factor, use a second K-loader (if available) mated to the aircraft as a bridge to prevent possible damage to the aircraft ramp.

When transporting loads via forklift, secure loads to the frame to prevent shifting and sliding off the tines. Secure pallets to the forklift prior to movement when loading/offloading or transporting pallets on forklift with rollerized tines, when pallets are top/side heavy, and when snow or ice may have accumulated between the forklift tines and the pallet. Secure all objects of irregular shape, including aircraft engines, to the forklift mast frame before raising, lowering, or moving. Place large, irregularly shaped objects on pallets for stability before transporting. When driving to or from the aircraft, make sure you take proper designated routes when transporting explosives and obey flight-line speed limits and operations procedures.

Secure non-unitized warehouse skids or individual containers of explosives to MHE (including forklifts) to prevent movement. It is not necessary to secure cargo to the forklifts when container skids or pallets have integral 360° tine enclosures. Ensure protruding engine parts (i.e., afterburners, etc.) are not damaged during transport.

Vehicle operators are responsible for ensuring safety compliance. When you must remain in the cab of the K-loader, the loading supervisor is responsible for ensuring compliance with all safety precautions.

229. Load/offload aircraft

As you can see, loading/offloading aircraft requires skillful preparation, but it also requires close coordination between air terminal work centers. Before you can load the aircraft, ATOC will brief the loadmaster/boom operator on the load that will go on the aircraft. They will also coordinate a load time and pass that load time to ramp/aircraft services. For stations without an ATOC, ramp/aircraft services personnel will brief the loadmaster/boom operators.

Make safety your most important consideration. If you follow all the rules and remain aware at all times, you will eliminate accidents; however, if you are careless and rush to get the job done, you will cause mishaps. Everyone involved in the on/offloading process must be constantly alert for potential accidents and remain fully aware of the need for constant caution in high hazard areas.

Your load team chief conducts a detailed briefing concerning all aspects of the load with all members of the load team. The load team chief also ensures the required equipment is available and delivered to the aircraft (i.e., ramp support, bridge plates, chock, shoring, etc.). In addition, he or she assigns qualified drivers to operate the MHE to transport the load to the aircraft and perform loading operations. The load team chief, load team, and the loadmaster/boom operator/contractor representative all work together to ensure the cargo is safely loaded.

Performing load team chief duties

Load team crew chiefs are the aerial port's last step in the quality control process. They should cross check details on the load pull sheet against the cargo markings and types of cargo to prevent shipping cargo to unauthorized destinations and exceeding aircraft limitations. Load team chiefs will review the Load Team Chief Procedural Guide (AMCI 24-101, Vol. 11, Attachment 6). This guideline/checklist must be present during the on/offload of aircraft. Local management may add to, but not subtract from, this guideline/checklist. As the load team chief you will brief load crews about unique load characteristics and loading prior to actual on load or/offload (e.g., explosives, HAZMAT, vehicles, and outsize cargo). You will ensure all necessary equipment is available and delivered to the aircraft (i.e., ramp support, bridge plates, chock, shoring, etc.) and assign qualified drivers to operate the MHE to transport the load to/from the aircraft and load/offload the aircraft. Loading operations is

a coordinated effort between the load team chief and the loadmaster/boom operator/contractor representative. The load team, under the direction of the load team chief, assists the loadmaster/boom operator in preparing the aircraft for loading. All offloading operations is a coordinated effort between the load team chief and the loadmaster/boom operator or other representative. The aircrew loadmaster retains overall responsibility for loading aircraft. The load team chief coordinates with the aircrew loadmaster to present the manifest; discuss load sequence, ground vehicle direction, tie-down pattern; and obtain completed outbound DD Form 365-4, Weight and Balance Clearance Form F-Transport/Tactical.

Maintaining access and clearance

Flight crews must have access to the rear of the aircraft during flight; cargo must be loaded to permit this. The permanent walkways along each side of the cargo compartment provide the required access. You must ensure no part of the cargo/mail load protrudes beyond the vertical stacking line of the pallet and into the walkways. Tie-down devices stretched across the aisle are not considered an obstruction unless such devices are higher than 18-inches above the floor or are spaced less than 18-inches apart.

When loading palletized, netted cargo, or floor-loaded cargo secured with straps, maintain *at least* a 30-inch space between the cargo and the nearest forward occupied seat. When the cargo consists of vehicles, canned engines, or other large items secured with chains and devices, the 30-inch spacing is not required. On KC-135 aircraft equipped with rollers, maintain a 14-inch space between the seats and the vertical stacking line of cargo on pallets. Make seating arrangements to allow passengers to evacuate from exits permitting best access to emergency equipment. Consider all exits, including passenger and cargo loading doors, as emergency exits. Litters erected across an emergency exit do not constitute an obstruction.

Load soft materials, such as baggage, mail, and cardboard boxes, in the lower-lobe compartments to avoid damage to the aircraft. Also, maintain clearance around internally mounted auxiliary power units and other installed equipment. Use extreme caution during loading to prevent damage to the pressure seal of the lower compartments, and exercise care in positioning cargo/mail in the compartment so the floor or sides of the compartment are not punctured.

Loading pallets

Before loading pallets on the aircraft, position all the pallet side rings in the up position to prevent them from binding in the rail system. Do not use pallet locks as pallet stops and avoid walking on aircraft restraint rails. However, you may walk on the C-130 restraint rails when the guard is in place.

Ensure you are pushing pallets, rather than pulling them onto the aircraft. Do not position yourself between locked-in place pallets *and* those being loaded. When pushing pallets onto the aircraft, avoid excessive speeds by maintaining control of the pallet at all times. Never gravity feed pallets.

On/offloading a knelt C-5 is not considered gravity feeding as long as the pallets are controlled.

Ensure the pallet has adequate clearance on the sides, top, and bottom to avoid hitting the aircraft. The K-loader driver must not lower or raise the bed of the vehicle while pallets transition onto the aircraft ramp.

Loading vehicles and rolling stock

When loading vehicles and rolling stock, the load team chief selects licensed personnel to drive vehicles and equipment on/off the aircraft. For most specialty vehicles, shippers provide qualified drivers; however, when a licensed operator is not available, the load team chief must first consider other methods of loading. If no other method of loading is feasible or practical, the ramp supervisor notifies ATOC. When all efforts to obtain a licensed operator are exhausted, the ramp supervisor determines the most qualified individual to safely operate and load the vehicle on/off the aircraft. The loadmaster/boom operator directly supervises the loading operation.

When using the aircraft auxiliary ground loading ramps to load a vehicle, make sure they are properly installed and spaced to align with all wheels of the vehicles and equipment being loaded. When loading a vehicle directly from the platform of a K-loader, ensure bridge plates and truck loading ramps are properly installed and spaced to align with all wheels of the vehicle and equipment being loaded.

When loading vehicles and rolling stock on the aircraft, also ensure the following:

- The aircraft ramp support (milk stool) is properly installed.
- All required shoring is available at the aircraft and installed as required.
- Fire extinguishers are available.
- The cargo compartment has adequate ventilation to allow vehicle fumes to escape.

Before driving the vehicle on the aircraft, check the brakes to make sure they work; then, place it in the lowest gear available or in low range or four-wheel drive, if applicable. The loadmaster/boom operator/spotter directs the vehicle into the aircraft and into the load-planned position slowly and safely.

When the vehicle is positioned properly, the driver makes sure the vehicle is in its lowest gear and sets the parking brake. If the vehicle is an automatic, the driver places it in park and sets the parking brake. The only exception is for diesel and multi-fueled vehicles, which remain in neutral. The driver turns the vehicle off when directed and remains in the vehicle until the load team initially restrains the vehicle both forward and aft.

Offloading procedures

Load teams receive information on inbound aircraft from ATOC through their dispatch personnel. This information includes a complete load breakdown, as soon as it is available. From this load breakdown, load team chiefs can determine which equipment to use to offload the aircraft. Load teams offload all terminating cargo and mail from the aircraft and deliver it to the terminating cargo receiving area.

ATOC also passes load teams/aircraft services personnel an arrival time for the aircraft. The ramp supervisor assigns a team to offload the aircraft. The offload team ensures all necessary equipment is available and meets the aircraft promptly and safely.

All safety precautions that apply to onloading cargo apply to offloading as well. The load team, load team chief, and loadmaster/boom operator must work together to offload the cargo quickly and safely.

The load team delivers the offloaded cargo to the terminating cargo processing section where cargo-processing personnel start receiving and in-checking actions. When possible, keep individual mission loads together and process loads in order of aircraft arrival and priority. Deliver special handling shipments directly to the special handling section.

230. Tie-down aircraft loads

Load teams assist the loadmaster/boom operator in locking all pallets into position and applying all required tie-down upon the completion of the upload. Restrain all loaded cargo so it does not shift in flight. Since the aircraft is in motion from the moment it leaves the cargo ramp to the moment it is blocked in at its destination, all cargo has the potential to move in various directions, depending on the forces that act on the aircraft. These forces are directly proportional to the cargo's weight.

General restraint principles

The amount of restraint you place on cargo depends on the weight of each cargo unit and the forces acting on each unit due to a change in motion. Motion can be forward, aft, vertical, lateral (right or left), or a combination of these.

Cargo restraint must be adequate for the greatest force placed on the cargo. These forces are expressed in terms of load factors. For example, if a cargo unit is subjected to a load 1.5 times its weight, it must be restrained for a load factor of 1.5 to prevent it from shifting. Restraint applied to

the cargo to prevent movement is identified by the direction in which the cargo would move if not restrained. Forward restraint prevents cargo from moving forward, aft restraint prevents cargo from moving backwards, lateral restraint prevents cargo from moving side to side, and vertical restraint prevents cargo from rising off the cargo floor.

The *minimum* restraints used to prevent the cargo from moving in any direction are called “restraint criteria.” Expressed in units of the force of gravity (G), the minimum restraint criteria for cargo are as follows:

Minimum Restraint Criteria	
Direction	Minimum Restraint
Forward	3.0 Gs
Aft	1.5 Gs
Lateral (right and left)	1.5 Gs
Vertical	2.0 Gs

One helpful way to remember which direction is which G is to remember that forward is 3 Gs and vertical is 2 Gs. ALL others are 1.5 Gs, with the “A” in “ALL” standing for aft, and the “Ls” in “ALL” standing for lateral right and left.

Restraint applied only for one direction will not restrain cargo in another direction, but you can and should always apply restraint to cover three directions. This will achieve effective restraint and minimize the amount of restraint you must apply. Restraint that simply passes over or around a unit of cargo is an example of single-direction restraint. As figure 3-23 shows, you would have to apply several more restraint devices to achieve the required restraint.

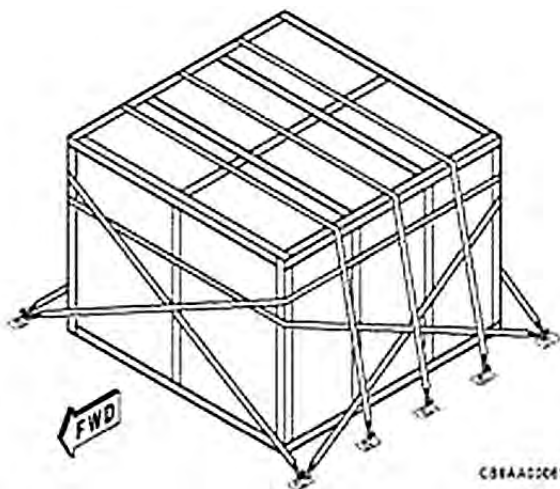


Figure 3-23. Single-direction restraint.

A strap or chain gate provides restraint in only one direction. However, a chain bridle provides restraint in more than one direction (fig. 3-24). When a tie-down strap or chain is placed around a piece of cargo and the attachment points are to two adjacent tie-down fittings, the effective value of the strap or chain is doubled, provided the fittings are equal to or higher than the value of the strap or chain. For example, in figure 3-24, there are two attachment points on the chain gate. Let’s assume the chains and devices are rated at 10,000 lbs. and the tie-down ring on the aircraft is rated at 25,000 lbs. Since there are two attachment points, that cargo will have 20,000 lbs. of restraint applied for that direction. Let’s say however, that the 10,000-lb. chains were attached to pallet rings instead, which are rated at 7,500 lbs. The pallet rings would be the limiting factor in this case and you would only receive 15,000 lbs. of total restraint for that direction.

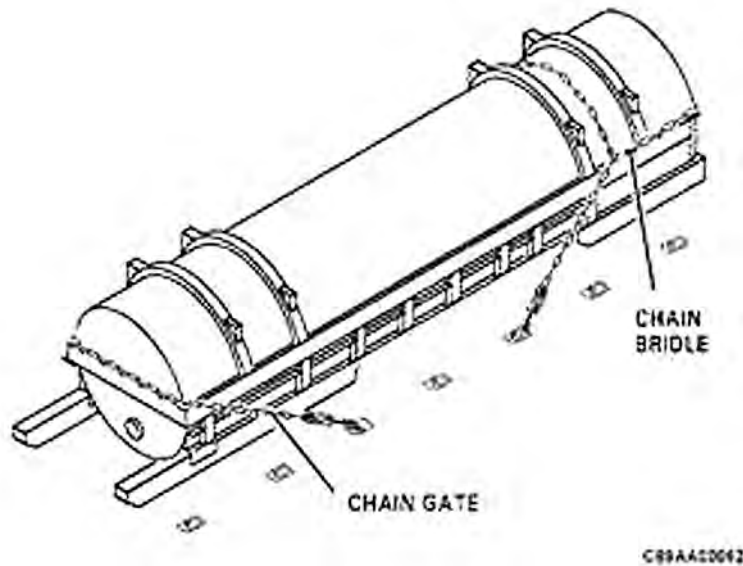


Figure 3-24. Chain gate versus chain bridle.

Also, you must consider where you attach the tie-down. Each aircraft provides plenty of tie-down points, but some cargo does not. If the cargo has tie-down points, ensure you consider the strength of them before attaching tie-down. If cargo does not have tie-down points, you must attach it somewhere that has enough strength and stability to tolerate the gravitational forces of the aircraft movement, like the axles, frame, or chassis.

Also, place tie-down on cargo so that when you draw an imaginary line from the tie-down upward, the lines intersect above the cargo, not anywhere below the cargo's height. This prevents the cargo from overturning when subjected to both upward and side G forces.

Any tie-down you apply must be symmetrical; therefore, you must attach them in pairs for each direction. Unsymmetrical tie-down permits cargo to shift, which may result in tie-down failure. All tie-down stretches when subjected to G forces. A longer length tie-down stretches further than a shorter length tie-down; therefore, symmetrical tie-downs should be as close to the same length as possible.

Under tension, straps stretch more than chains and allow the chains to restrain most of the load. So, when you apply more than one type of tie-down to cargo for the same direction, you must use the same type (steel chains with steel chains versus steel chains with nylon straps). Make sure you tighten all tie-down equally to restrain the load equally as well.

Sometimes, cargo loaded close to the ramp has tie-downs that must be connected to the ramp. When this happens, check the cargo for tie-down security before and after closing or opening the ramp. If you tie-down a vehicle to the ramp when it is open, the chains or straps become extremely loose when the ramp is closed. Likewise, if you do not remove the tie-down before the loadmaster opens the ramp door, damage could occur to the aircraft, cargo, and tie-down. When removing or installing tie-down for these purposes, ensure the vehicle still has some forward and aft restraint on the main cargo floor for safety purposes (referred to as safety chains). When determining the type and quantity of tie-down devices, use the following guidelines:

- Use the *minimum* amount of tie-down to achieve required restraint.
- Determine restraint achieved by using the lowest rating of the following: tie-down fittings used, cargo attachment points used, or the strength of the tie-down used.
- Do not use straps and chains to restrain cargo in the same direction. However, you may use 10,000-lb. and 25,000-lb. rated devices with appropriate chains for the same direction.

- Attach tie-down symmetrically using corresponding fittings on each side of the cargo centerline.
- Normally, attach tie-down chains to the cargo. Attach devices first to the floor rings and then to the tie-down chains. Remove slack in the chains by adjusting the tension device.
- Use straps or other nylon tie-down on crates, boxes, or items that may crush easily. Straps under tension are easily cut by cargo, so do not use them over sharp edges.
- Use chains on heavy objects that have attachment lugs or a hard surface for the chains to go around.

Let's say you have a vehicle that weighs 5,600 lbs. Multiply the weight of the vehicle (5,600 lbs) times the Gs exerted on the cargo in the direction for which you need tie-down. We'll figure out tie-down requirements for all directions for this vehicle. The vehicle will be tied down to the aircraft cargo floor using 25,000-lb. rings.

To calculate *forward restraint*, multiply 5,600 lbs. by 3 Gs. Forward G forces will exert 16,800 lbs. on this vehicle, so we must restrain it for that much weight in that direction. Using two 25,000-lbs. chains would provide 50,000 lbs. of restraint, which is too much for this vehicle. We can use two 10,000-lb. chains to provide 20,000 lbs. of forward restraint to achieve the required amount. Remember, we must use tie-down in pairs and symmetrically. Using one 25,000-lb. chain would be sufficient weight-wise *but unsafe and ineffective*.

To calculate *vertical restraint*, multiply 5,600 lbs. by two Gs. Vertical G forces will exert 11,200 lbs. on this vehicle. Again, using two 25,000-lb. chains would be overkill. Using two 5,000-lb. straps would not provide enough restraint. Using two 10,000-lb. chains would provide more than enough restraint; that is your *best option*. To calculate *lateral and aft restraint*, multiply 5,600 lbs. by 1.5 Gs. Lateral and aft G forces will exert 8,400 lbs. on this vehicle. Using two 5,000-lb. straps for each direction would be enough to restrain this item; however, it depends on the vehicle. Remember, we cannot risk damaging the straps by sharp edges so 10,000-lb. chains might work better in this case and provide plenty of restraint.

You could apply the eight 10,000-lb. chains we calculated for this vehicle and achieve the required restraint; however, it is inefficient and unnecessary to do so if you apply the chains in a manner that allows them to achieve restraint for more than one direction. To do this, you must know something about the angles of the tie-down. Depending on how you apply the chains, you could reduce the number of chains required to six or even four total chains.

Tie-down angles

As mentioned, apply tie-down for *more than one direction of restraint*. By varying the angle of pull of the tie-down, it provides simultaneous restraint in three directions. When you attach a chain and device as shown in figure 3-25, with the force and tie-down running parallel, it provides full restraint for that one direction. However, this is not an efficient use of tie-down.

You will have to add more tie-down to achieve enough restraint for the other directions.

Usually, you will attach restraint to cargo much like figure 3-26. When using this method, you achieve restraint simultaneously in two or three directions. You cannot achieve full restraint in one

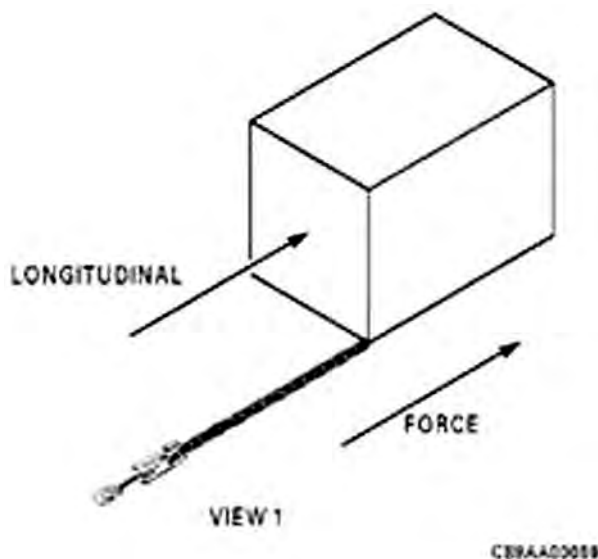
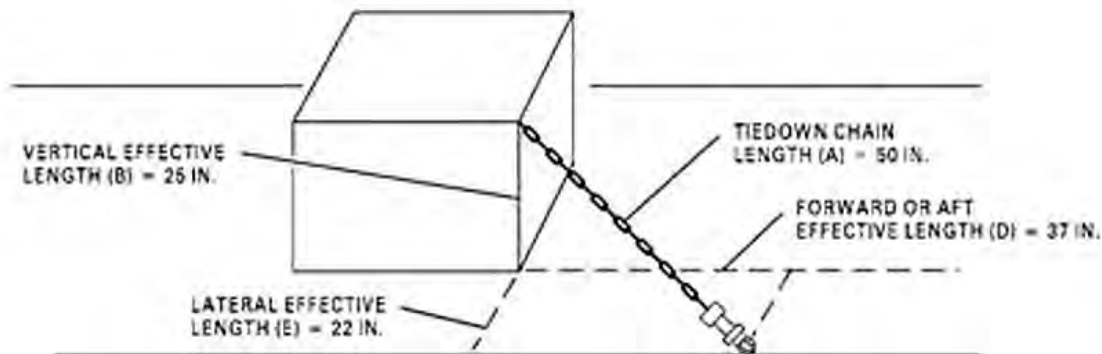


Figure 3-25. Inefficient restraint.

direction because the restraint is not parallel to the forces being exerted on the cargo. You *achieve full restraint by attaching tie-down devices symmetrically in pairs to the opposite corners or ends of the cargo.*



NOTE

THIS FIGURE ILLUSTRATES A METHOD OF DETERMINING EFFECTIVE RESTRAINT FOR CARGO TIEDOWN. AS ILLUSTRATED, TIEDOWN RATIOS CAN BE DETERMINED BY DIVIDING TIEDOWN CHAIN LENGTH INTO EFFECTIVE LENGTH FOR DIRECTION IN WHICH RESTRAINT IS REQUIRED. THIS RATIO IS THEN MULTIPLIED BY THE STRENGTH OF THE TIEDOWN CHAIN OR ATTACHMENT POINT, WHICHEVER IS LESS, TO FIND THE RESTRAINT RECEIVED FROM THE TIEDOWN PATTERN USED.

EXAMPLE:

- A. MEASURE LENGTH OF TIEDOWN CHAIN (A) FROM TIEDOWN FITTING TO ATTACHMENT POINT ON CARGO (50 INCHES).
- B. MEASURE EFFECTIVE VERTICAL LENGTH (B) FROM ATTACHMENT POINT ON CARGO TO A POINT DIRECTLY BENEATH IT ON THE CARGO FLOOR (25 INCHES).
- C. DIVIDE TIEDOWN CHAIN LENGTH (A) INTO VERTICAL EFFECTIVE LENGTH (B) TO DETERMINE RATIO.

$$\frac{25}{50} = 0.50 \text{ RATIO}$$
- D. MULTIPLY THIS RATIO BY RATED RESTRAINT (25,000 POUNDS) OF TIEDOWN CHAIN.*

$$25,000 \times 0.50 = 12,500 \text{ POUNDS}$$
 EFFECTIVE VERTICAL RESTRAINT RECEIVED FROM CHAIN.
- E. FOR DETERMINING EFFECTIVE FORWARD OR AFT RESTRAINT OBTAIN A FORWARD OR AFT EFFECTIVE LENGTH (D) BY MEASURING FROM A POINT DIRECTLY BENEATH ATTACHMENT POINT ON THE CARGO ALONG A LONGITUDINAL AXIS TO A POINT LATERAL TO THE TIEDOWN FITTING BEING USED (37 INCHES).
- F. DIVIDE TIEDOWN CHAIN LENGTH (A) INTO FORWARD OR AFT EFFECTIVE LENGTH (D) TO DETERMINE RATIO.

$$\frac{37}{50} = 0.74 \text{ RATIO}$$
- G. MULTIPLY THIS RATIO BY RATED RESTRAINT (25,000 POUNDS) OF TIEDOWN CHAIN.*

$$25,000 \times 0.74 = 18,500 \text{ POUNDS}$$
 EFFECTIVE FORWARD OR AFT RESTRAINT RECEIVED FROM CHAIN.
- H. FOR DETERMINING EFFECTIVE LATERAL RESTRAINT, OBTAIN A LATERAL EFFECTIVE LENGTH (E) BY MEASURING FROM A POINT DIRECTLY BENEATH ATTACHMENT POINT ON THE CARGO TO THE ROW OF TIEDOWN FITTINGS BEING USED (22 INCHES).
- I. DIVIDE TIEDOWN CHAIN LENGTH (A) INTO LATERAL EFFECTIVE LENGTH (E) TO DETERMINE RATIO.

$$\frac{22}{50} = 0.44 \text{ RATIO}$$
- J. MULTIPLY THIS RATIO BY RATED RESTRAINT (25,000 POUNDS) OF TIEDOWN CHAIN.*

$$25,000 \times 0.44 = 11,000 \text{ POUNDS}$$
 EFFECTIVE LATERAL RESTRAINT RECEIVED FROM CHAIN.

*IF THE TIEDOWN CHAIN IS ATTACHED TO A PALLET RING, THE RATED RESTRAINT WOULD BE 7,500 POUNDS. THE RATIO WOULD BE MULTIPLIED BY 7,500 TO DETERMINE THE EFFECTIVE RESTRAINT RECEIVED.

Figure 3-26. Tie-down angles.

Tie-down forms three angles when attached to a load (fig. 3-26). The floor (vertical) angle is the angle between the chain and the floor. The longitudinal-plan angle is the angle between the chain and a line that runs forward and aft through the attachment point. The lateral-plan angle is the angle between the chain and a line, which runs laterally through the attachment points.

Tie-down chains attached at floor and plan angles of 30° provide the best adequate restraint in all directions. Increasing the floor angle, while keeping constant plan angles, provides a higher value of vertical restraint but reduces the amount of longitudinal and lateral restraint. Keeping the same floor angle, but increasing the plan angle in one direction, does not affect the vertical restraint but reduces the longitudinal restraint while increasing lateral restraint.

To calculate if you have applied enough restraint to a piece of cargo in any given direction, you *first* measure the length of the tie-down you applied from the attachment point on the cargo to the attachment point on the floor or pallet. Then measure the distance of one of the three angles discussed in the previous two paragraphs. If you want to know how much vertical restraint is provided, measure the floor (vertical) length. If you want to know how much forward and aft restraint is provided, measure the longitudinal-plan length. If you want to know how much lateral restraint is provided, measure the lateral-plan length.

Divide the length of the chain into either the floor or plan length to get a ratio and multiply this ratio by the lowest amount of restraint provided by your tie-down. If you used 10,000-lb. chains attached to a 25,000-lb. tie-down ring, multiply the ratio by 10,000 lbs. If you used a 10,000-lb. chain attached to a cargo pallet ring (rated at only 7,500 lbs.), use 7,500. That gives you the amount of restraint provided by that one tie-down for that one direction. Then calculate the lengths for the other directions and the rest of the tie-downs applied the cargo. Figure 3-25 shows examples of how to figure out how much restraint your tie-down has for a given direction.

Once you become familiar with and practice calculating restraint, it will become easy. Remember to first compute the number of chains required, and apply the restraint for each direction in pairs and symmetrically. Remember to stow all unused tie-down equipment in proper storage areas before the aircraft departs. When offloading cargo, stow the tie-down before you leave the aircraft.

231. Conduct engine running on/offload

Especially in deployed environments, you must work as quickly as possible to on/offload aircraft. If you are deployed to a hostile location, you never want to keep an aircraft on the ground for longer than it needs to be. Sometimes an aircraft needs a shorter ground time for other reasons. Commanders have the ability to authorize various ways to minimize the ground time for aircraft. One way is to authorize load crews to on/offload an aircraft with the engines still running. This minimizes the procedures and checklists the aircrew must go through to start the operation of an aircraft. The other is to authorize concurrent servicing; this allows the aircraft to be loaded with cargo while being refueled or receiving oxygen service. Concurrent servicing also allows the aircraft to be serviced with fuel or oxygen with passengers onboard.

Performing engine running on/offload (ERO) operations involves high risks and should only be authorized when there is a need for such operations and when the operations present no safety of flight issues. Before authorizing ERO operations, commanders must use the RM process to assess the risks associated with ERO operations. ATOC is the coordinating and approving authority for aerial port ERO operations and support. In addition, ERO operations must be coordinated through the appropriate channels, such as TACC, Command Post, and the agencies performing ERO operations.

Some of the *risks* to consider *before* performing ERO operations are as follows:

- Whether the operation will be during daytime or nighttime.
- Weather.
- Experience levels.

- Type of cargo and passengers.
- Location of operations.

It is less risky to perform ERO operations during the day with better visibility. Darkness adds an additional element of risk that may need to be avoided in some situations.

In inclement weather, surfaces can become slippery for aircraft, vehicles, load team personnel, and passengers. Since aircraft chocks are not used during ERO operations, there must be no danger of the aircraft sliding with its brakes set on the parking ramp. Vehicle operators must be able to see clearly during inclement weather. If their vision is impaired, it is not safe to perform the ERO. In addition, self-propelled vehicles can lose traction on ground and aircraft surfaces during inclement weather. In this case, the vehicles can be winched onto the aircraft or arctic/nonskid shoring can be used.

Also, the experience levels of ERO team members must be considered. Qualified and experienced members are faster, more comfortable, and more proficient in performing ERO operations. Trainees, augmentees, and cargo users require more supervision and direction.

Because of the high risk of ERO operations, explosives will not be on/offloaded unless authorized by a joint airborne and air transportability training (JA/ATT) exercise operations order, or contingency air tasking order. Small arms ammunition, Class 1.4, is the *only exception* to this rule.

Prior to ERO operations, brief passengers on all safety requirements. In addition, passengers must have hearing protection.

The location of the ERO is also an important consideration. There may be limited clearance around the aircraft to maneuver loading vehicles; there may be a high volume of other flight-line traffic in the area or limited space to assemble passengers and cargo.

Building ERO teams

An ERO normally consists of load teams, maintenance personnel, and cargo users working together. The number of teams depends on how many aircraft are on the ground at once. Aircrews and ground crews must coordinate and communicate closely during operations to load the aircraft safely.

The three-person aircraft maintenance team directs, marshals, and parks aircraft and controls the aircraft perimeter. The load team on/offloads cargo and consists of one load team chief and other personnel as required to accomplish the operation. Cargo users consist of deploying unit or arrival/departure airfield control group (A/DACG) personnel, who assist the maintenance and load teams as much as possible.

Required equipment when conducting ERO operations

All personnel involved in ERO operations possess and use the following safety equipment:

Always	During Hours of Darkness or Reduced Visibility
✓ Gloves	✓ Reflective vests or belts.
✓ Steel-toed boots	✓ Light wands for spotting.
✓ Hearing protection	
✓ Goggles (optional for C-17 EROs)	
NOTE: Use other equipment as required. This can include MHE, a prime mover with a front-mounted pintle hook, C-130 ramp support (milk stool), extra sets of C-130 auxiliary ground loading ramps, etc.	

Conducting ERO briefings

Due to the *fast-paced* nature of an ERO, all personnel must understand exactly what they will be doing before participating. *ERO operations cannot slow or stop to clarify or train load teams.* The load team chief conducts a briefing prior to beginning ERO operations. The briefing includes all

personnel involved in the operation, including the loadmaster, once the load team chief is on the aircraft. The briefing includes topics such as spotter signals, the route to and from the aircraft, load team positions, cargo type, special on/offload instructions, and the use of any MHE. The load team chief ensures all load team members and passengers have the required safety items. Personnel assigned to direct vehicles and passengers wear distinctive clothing or equipment (e.g., reflective vests and wands for night operations) so the passengers know where to go.

Conducting onload duties

Load team chiefs maintain complete control of their load teams and position them in a preplanned area a *minimum of 50 ft. behind the aircraft when it has stopped*. The only *exceptions* are the C-5, which requires a minimum distance of 150 ft, and the C-17, which requires a minimum distance of 25 ft. This preplanned area must be clear of engine exhaust and outside the aircraft-turning radius.

Approaching the aircraft

You, as a load team member, will not approach the aircraft until all engines are in low-speed ground idle or reverse thrust. In addition, when performing ERO operations on a C-5, you will not approach the aircraft until the aircraft scanner has opened the crew entrance door and deplaned. In all cases, *do not approach the aircraft until signaled to do so by an aircrew member*. During C-5 operations, you must approach the C-5 from the front. However, when on/offloading pallets through the aft doors of the C-5, the vehicle chocker approaches from the front and the aircrew scanner escorts him/her to the rear of the aircraft.

After the aircraft is in place and load team members signaled by an aircrew member, the load team chief quickly positions the team using a route that takes you perpendicular to the aircraft fuselage until you reach the aircraft centerline. You turn and approach the aircraft at that point and no sooner. You must stay the required distance behind the aircraft (C-5: 150 ft., C-17: 25 ft., all others: 50 ft.) until you reach the aircraft centerline and cut no corners. Stay clear of the aircraft ramp until the loadmaster positions it for on/offload. The loadmaster has a limited view of personnel around the aircraft ramp so it is your responsibility to stay clear while the loadmaster opens or closes it for loading operations.

Operating vehicles during ERO operations

Under the direction of the team chief, loading vehicle (K-loader, forklift, prime mover) operators position loads a minimum of 50 ft. (C-17: 25 ft.) aft and slightly to the right or left of the aircraft fuselage, leaving a clear path behind the aircraft. The preferred method for on/offloading the C-5 is in the forward kneel, drive-in position. C-5 loads will be positioned a minimum of 150 ft. forward and aft and slightly to the right or left of the aircraft fuselage. Only one piece of loading equipment approaches the aircraft at any given time. When on/offloading or transporting pallets on forklifts with rollerized tines, secure the pallets to the forklifts prior to movement.

Drivers for cargo vehicles remain in their vehicles when within 50 ft. of aircraft (C-5: 150 ft., C-17: 25 ft.) and until you secure the vehicle on the aircraft with one chain forward and one aft.

Loading the aircraft

Before loading any cargo, you must prepare the aircraft for the load. Trained team personnel install the extra set of aircraft auxiliary ground loading ramps, if necessary. Team members may assist the aircraft loadmaster in positioning stabilizer struts. Other team members position the first piece of equipment to be loaded at the bottom of the aircraft cargo ramp.

The loadmaster retains overall responsibility for loading aircraft. The load team chief coordinates with the loadmaster to present the manifests and discusses the load sequence, ground vehicle direction, and tie-down requirements. The load team chief also obtains a copy of the completed outbound Form F from the loadmaster.

The ground vehicle director takes a position clearly visible to the vehicle driver. If you are loading trailers, the vehicle director takes a position next to the driver's side cab of the prime mover. Load team members must observe load clearances within the aircraft.

The entire aircraft will be loaded except for the ramp. The ramp will be loaded after any passengers are loaded through the ramp.

Conducting offload duties

The offload procedures are the same as onload procedures with the following additional requirements.

The load team chief coordinates offload procedures and conditions with the loadmaster and receives all the manifests. The loadmaster directs passengers to deplane. Other load team members position themselves to the side of the aircraft ramp until all the passengers have deplaned. The team chief directs the team aboard to remove any remaining tie-down restraints, beginning with the first vehicle offloaded and working forward or aft for specific aircraft.

The ground vehicle director takes a position 25 ft. aft of the aircraft and directs the vehicles 50 ft. aft (C-5: 150 ft. forward and aft, C-17: 25 ft. aft) before turning to left or right to the receiving area.

The offload team places all tie-down equipment on the aircraft centerline and auxiliary loading ramps on the aircraft ramp as required and departs the aircraft. On a C-5, the offload team stows tie-down equipment in storage areas during kneeling and unkneeling if time permits.

When the aircraft is secured, the team chief stops 50 ft. (C-5: 150 ft. forward or aft) aft of the aircraft centerline and gives a "thumbs up" to inform the loadmaster the team and equipment are all clear of the aircraft.

Loading/offloading passengers

When the cargo upload is complete, *except for the ramp-loaded cargo*, the troop commander directs passengers onboard. All passengers must remain at least 50 ft. (C-5: 150 ft., C-17: 25 ft.) from the aircraft until reaching the aircraft centerline where the load team chief will direct them to the aircraft. The ramp is loaded after all passengers are onboard.

When offloading passengers, instruct them to proceed at least 50 ft. aft (C-5: 150 ft. forward and aft, C-17: 25 ft. aft) of the aircraft before turning left or right and continue parallel to the aircraft's wing at least 300 ft. (C-17: 200 ft.) before stopping.

Passengers *should* exit through the aft cargo door and ramp on the C-130 and C-17. On the C-5, passengers should exit through the forward ramp. Offload passengers before offloading cargo and load the passengers after unloading cargo, unless cargo size and location dictate otherwise.

Brief all passengers on the hazards involved with ERO procedures before on/offloading them. The briefing must include securing loose articles, wearing hearing protection, and any local conditions that may exist.

Although passenger on/offloading should always be done through the cargo doors, sometimes it is necessary to on/offload them through the crew entrance door. When on/offloading passengers, baggage, or equipment through the crew entrance door, stay clear of the engine inlets. Secure all loose personal items before passing in front of operating engines. Brief all passengers to remain forward of the extended interphone cord and brief all personnel not to proceed aft of the crew entrance door (toward the engines) while the engines are operating. Passenger buses will park in front of the aircraft on the left side with the nose of the bus pointing away from the aircraft and no closer than 50 ft. (C-5: 150 ft.) forward of the left wing. All crew entrance door on/offloading will be coordinated through the aircraft commander, Command Post, and ERO functional areas.

232. Performing concurrent servicing

There may be times when meeting mission timelines becomes necessary. There are procedures in place to accommodate both maintenance and aerial port functions while servicing aircraft. One area to speed up aircraft servicing is by conducting fueling operations at the same time as loading/offloading operations. This is called “concurrent servicing.”

Concurrent servicing is servicing fuel or oxygen with passengers onboard or while on/offloading cargo or baggage. Concurrent servicing can also include fleet services duties or minor maintenance.

When an aircraft is refueled, fuel is pumped from the fuel truck to the aircraft and an electrostatic charge is built up between them. When the charge is high enough to jump between the containers, a spark will occur. If there is fuel near the spark (above or near the fuel cap), a fire or an explosion could happen.

Vehicles moving along roads can also produce a static-electrical buildup on them. Humans conduct electricity and can carry an electrostatic charge as well. Just think of a time when you have walked on a rug and then created a spark by touching the doorknob. You can create at least 3,500 volts during this simple act. Luckily, no harm is done because of the low amperage. However, aircraft electronics can be very delicate and easily affected by even lower voltages. Static-electricity discharge can be prevented by two methods: bonding and grounding.

Grounding is the process of connecting one or more metallic objects or ground conductors to ground electrodes. To ground equipment, you must provide a conductive electrical path into the ground. This prevents a static charge from collecting on the surfaces of equipment where it could discharge as a spark. The connection to the equipment must be to a clean, unpainted, non-oxidized metal surface.

Bonding is the process of connecting two or more metallic objects together through a conductor. This equalizes electrostatic potential between two or more conductive objects. Bonding does not dissipate static electricity. It equalizes the charge on the two objects to stop the sparking in the presence of flammable vapors.

Unless otherwise specified, we will use the term “grounding” to represent both grounding and bonding actions.

Responsibilities

Concurrent servicing supervisors (CSS) will always be present during concurrent servicing operations and have control over the entire operation and all personnel, including aerial port personnel. However, the CSS does not have control over fire fighting and rescue units. They primarily position themselves at the nose of the aircraft and wear reflective vests during operations with the letters “CSS” on the front and back.

The first step in conducting concurrent servicing operations is to coordinate your operations with CSS personnel and report any condition that might jeopardize safety prior to and during concurrent servicing operations. If concurrent operations are already in progress, load team chiefs or other personnel must report to the CSS prior to entering the area.

Performing concurrent servicing safely

Before performing any operation (e.g., refueling operations, explosives loading), all personnel must ground themselves to a suitable grounding point or to a bare, unpainted portion of the aircraft. If a spark occurs when you first ground yourself, you must then reground yourself periodically during operations. Avoid grounding within 3 ft. of aircraft fuel-vent outlets.

Certain types of cargo will not be on/offloaded during concurrent servicing operations: explosives, munitions, oxygen, flammable gases, and flammable liquids. Winching cargo and loading nonpalletized, self-propelled vehicles can only be performed on the C-5, C-17, C-130, and KC-10 aircraft. Do not use the open-flame heater of Tunner K-loader near the area. All authorized vehicles

must remain at least 25 ft. away from aircraft fuel-vent outlets or pressurized fuel-servicing system components during operations.

You may use laptop computers, cell phones, and nontactical radio equipment if authorized in the area during concurrent operations, but you may not change the batteries.

Loading /offloading passengers

A passenger service representative stays in constant contact with the CSS or aircrew representative during operations. The representative briefs all passengers on the type of operation that is occurring and gives the option to deplane if the passengers wish. Passengers are not allowed in the cargo compartment during winching operations. They can enter or exit the aircraft during operations if a jet way or stairs are used and refueling operations are on the opposite side of the aircraft. Ensure ramps and stairs are properly positioned and unobstructed. Passengers must stay at least 25 ft. from any fuel vent and cannot smoke at any time.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

227. Performing flight-line safety and ground spotter duties

1. What is the spotter zone?

2. How far from the aircraft must loading vehicles be when making minor adjustments?

3. Within how many feet of an aircraft must chocks be used on a vehicle?

4. When can a spotter spot a vehicle and chock at the same time?

5. When are spotters required?

6. When using two spotters, which spotter will the vehicle operator follow?

7. What do you do if the vehicle operator loses visual contact with the spotter?

8. What do the following signals mean?



Figure 3-27.

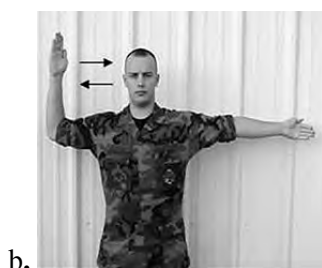


Figure 3-28.



Figure 3-29.



Figure 3-30.



Figure 3-31.



Figure 3-32.



Figure 3-33.

228. Transporting/securing aircraft loads

1. When transporting loads to the aircraft, what information about the aircraft must you verify?
2. How do you secure rolling stock to K-loaders for transport?
3. Why must you ensure there are *no* chains or straps dangling from the vehicle?
4. Who is ultimately responsible for ensuring safety compliance when transporting cargo?

229. Load/offload aircraft

1. Who conducts a detailed briefing with all members of the load team before loading an aircraft?
2. When loading palletized, netted cargo, or floor-loaded cargo secured with straps, how much space will there be between the cargo and the nearest forward passenger seat?
3. What must you do before loading pallets to prevent them from binding in the rail system?
4. How do you avoid excessive speeds when loading pallets on an aircraft?

5. When all efforts to obtain a licensed operator for loading a vehicle have been exhausted, who determines the most qualified individual to safely operate and load the vehicle on/off the aircraft?
6. In what gear is the vehicle when driving it onto the aircraft?
7. When can the driver get out of the vehicle after it is positioned properly on the aircraft?
8. Once an aircraft is offloaded, where is the cargo delivered?

230. Tie-down/securing aircraft loads

1. How many Gs must you restrain cargo for the *forward* direction?
2. How many Gs must you restrain cargo for the *vertical* direction?
3. How many Gs must you restrain cargo for the *aft and lateral* directions?
4. What is the advantage of using a chain bridle over a chain gate?
5. Where do you attach the tie-down if the cargo *does not* have tie-down attachment points?
6. Using straps and chains for the same direction is *not allowed*. Why?
7. When should you use straps to tie-down cargo?
8. How many 10,000-lb. chains would be required for each direction (forward, aft, lateral, and vertical) to restrain a vehicle that weighs 8,200 lbs.?
9. How many 25,000-lb. chains would be required for each direction (forward, aft, lateral, and vertical) to restrain a vehicle that weighs 29,350 lbs.?

10. How many directions of restraint can a tie-down device (chain, strap, etc.) provide?
11. How many angles should tie-down cover when attached to a load?
12. Tie-down chains attached at floor and plan angles of how many degrees provide the *best restraint in all directions*?
13. Which angle do you measure if you want to know how much vertical restraint is provided?
14. What two numbers do you divide to obtain the angle ratio?

231. Conduct engine running on/offload

1. What risks do you consider before performing engine running on/offloads?
2. Which safety equipment must you always possess and use when performing ERO operations?
3. The load team chief must give a briefing prior to beginning ERO operations that includes which topics?
4. How far away from each aircraft will load teams pre-position themselves behind the C-5, C-130, and C-17 aircraft?
5. When is it safe to approach the aircraft during ERO operations?
6. How will vehicle chockers approach and position themselves on a C-5 during ERO operations?
7. What route will load team members take to the aircraft during ERO operations?
8. When performing offload ERO operations, when does the load team chief signal to the loadmaster for all personnel to clear of the aircraft?

9. When are passengers loaded during ERO operations?
10. Passengers are briefed on which topics during ERO operations?
11. Passenger on/offloading should always be done through which doors?

232. Performing concurrent servicing

1. What is concurrent servicing?
2. What are the two methods to prevent static-electricity discharge?
3. Who has control over the entire concurrent servicing operation and personnel?
4. What must all personnel do before performing any concurrent servicing operations?
5. Which types of cargo must *not* be on/offloaded during concurrent servicing operations?
6. What must the passenger service representative do when passengers are onboard an aircraft during concurrent servicing operations?
7. When can passengers enter or exit the aircraft during concurrent servicing?

Answers to Self-Test Questions

223

1. The number and type of equipment you have available, the number of qualified drivers you have available, how busy you will be, and the type of cargo being on/offloaded.
2. Consider size of the load and type of aircraft.
3. You can use the bare tines of a forklift to load/offload an aircraft, if needed for training or when rollerized tines are not available. However, use rollerized tines when they are available.

224

1. Length \times width.
2. Vehicles with cleats, lugs, studs, steel-tired wheels, and, in some cases, hard-rubber tires or tracks.
3. 100 psi.
4. Parking shoring.

5. Allows heavy cargo to be placed between the treadways on heavy supporting beams, which span the floor between the treadways.
6. Vehicles over 20,000 lbs. with balloon tires and spring-mounted vehicles.
7. As flush as possible and secure it so it does not shift in flight.
8. To reduce the ramp angle a vehicle must travel during on/offloading.

225

1. Pallet ID, destination, and weight. For loose shipments, match the TCN.
2. Discrepancies, such as damage, cleanliness, pilferage, improper tie-down, and documentation.

226

1. 6,500 lbs. per wheel or 13,000 lbs. per axle.
2. Through a ramp support platform or milk stool.
3. To pull cargo slowly into the aircraft when it cannot be pushed or driven.
4. To redirect the cable pull to adapt to the various modes of the winch operation.

227

1. Any area within 10 ft. of the aircraft.
2. 4–8 inches.
3. 10 ft.
4. Never.
5. Anytime there is restricted or limited visibility, anytime vehicles operate within 10 ft. of an aircraft, and anytime a 60K loader is within 15 ft. of any stationary object.
6. Only the primary spotter.
7. Stop operations.
8.
 - (a) Slow down.
 - (b) Right turn.
 - (c) Open fork tines.
 - (d) Tilt mast back.
 - (e) Lower rear only (pitch).
 - (f) Roll deck left.
 - (g) Front right (yaw).

228

1. Aircraft type, tail number, and parking spot.
2. Secured to the deck both forward and aft, using chains and devices. The brake must be engaged for those with an integral braking system.
3. It prevents tie-down from wrapping around the axle and damaging the loader, cargo, and tie-down.
4. Vehicle operators.

229

1. Load team chief.
2. 30 inches.
3. Position all the pallet rings in the up position.
4. Maintain control of the pallets at all times and never gravity feed pallets.
5. Ramp supervisor.
6. The lowest gear available or four-wheel drive, if applicable.
7. When the load team initially restrains the vehicle both forward and aft.
8. To the terminating cargo receiving area.

230

1. 3 Gs.
2. 2 Gs.
3. 1.5 Gs each direction.
4. It provides restraint in more than one direction.
5. You attach it somewhere that has enough strength and stability to tolerate the gravitational forces of the aircraft movement, like the axles, frame, or chassis.
6. Because under tension, straps stretch more than chains, allowing the chains to restrain most of the load.
7. On crates, boxes, or other items that may crush easily.
8. 4 forward, 2 vertical, 2 aft, 2 lateral each direction.
9. 4 forward, 4 vertical, 2 aft, 2 lateral each direction.
10. Three directions.
11. Three angles.
12. 30°.
13. The floor (vertical) length.
14. Divide the chain length into either the floor or plan length.

231

1. Day or night operations, weather, experience levels, type of cargo and passengers, and location of operations.
2. Gloves, steel-toed boots, hearing protection, and goggles (optional for C-17s).
3. Spotter signals, route to and from the aircraft, load team positions, cargo type, special on/offload instructions, the use of MHE.
4. 150 ft. for the C-5, 50 ft. for the C-130, and 25 ft. for the C-17.
5. Engines must be in low-speed ground idle or reverse thrust and until a crewmember signals you. For C-5s, the scanner must open the crew entrance door and deplane.
6. Chockers must approach a C-5 from the front and be escorted to the rear of the aircraft by the scanner.
7. A route that will take them perpendicular to the aircraft fuselage until they reach the aircraft centerline. They will turn and approach the aircraft only at that point.
8. When he or she is 50 ft. aft (C-5: 150 ft. forward or aft) of the aircraft centerline.
9. Passengers are loaded when all cargo except the ramp is loaded.
10. Securing loose articles, wearing hearing protection, and local conditions.
11. Through the cargo doors.

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1. Servicing fuel or oxygen with either passengers onboard or while on/offloading cargo or baggage. It can also include fleet service operations or minor maintenance.
2. Bonding and grounding.
3. CSS.
4. Ground themselves to a suitable grounding point or to a bare, unpainted portion of the aircraft.
5. Explosives, munitions, oxygen, flammable gases, and flammable liquids.
6. The representatives must stay in constant contact with the CSS or aircrew representative. They must also brief all passengers on the type of operation that is occurring and give them the option to deplane if they wish.
7. When the jet way or stairs are used and refueling operations are on the opposite side of the aircraft.

Complete the unit review exercises.

Unit Review Exercises

Note to Student: Consider all choices carefully, select the *best* answer to each question, and *circle* the corresponding letter. When you have completed all unit review exercises, transfer your answers to the Field-Scoring Answer Sheet.

Do not return your answer sheet to the Air Force Career Development Academy (AFCDA).

82. (223) You are a load team chief about to offload a C-17 with a mixed load consisting of pallets and rolling stock. Before beginning offload operations, you must consider the type of cargo
- a. offloaded, equipment availability, and number of qualified drivers.
 - b. onloaded, equipment availability, and number of qualified drivers.
 - c. offloaded, number and type of equipment available, and number of qualified drivers.
 - d. onloaded, number and type of equipment available, and number of qualified drivers.
83. (223) If using a pry bar to assist with loading, how much can you load on the pry bar?
- a. 250 lbs.
 - b. 355 lbs.
 - c. It depends on the aircraft.
 - d. It depends on the applicable pry bar technical order (TO).
84. (224) You have received an extremely heavy piece of cargo resting only on two skids. Which formula would you use to determine its contact area?
- a. $\text{Diameter}^2 \times 0.785$.
 - b. $\text{Length} \times \text{width (of each skid)}$.
 - c. $\text{Length} \times \text{width (of each skid)} \times 0.785$.
 - d. $\text{Length} \times \text{width (of each skid)} \times \text{the number of skids}$.
85. (224) You are loading a trailer on a C-5 that is very long, very tall, and has extremely low ground clearances. In order to reduce the ramp angle this vehicle must travel during onload, which type of shoring would you use?
- a. Bridge shoring.
 - b. Sleeper shoring.
 - c. Parking shoring.
 - d. Approach shoring.
86. (225) The special handling section is responsible for on or off loading
- a. previously bumped/frustrated cargo.
 - b. any material that requires a shippers declaration of dangerous goods.
 - c. loose shipments of "life or death urgency" material, very, very important parts, and registered mail.
 - d. loose shipments of outsized cargo, cargo deemed "special interest" by command issuing transportation request.
87. (226) Prior to loading the aircraft, the load team supervisor performs a pre-inspection of the
- a. manifests, cargo, and load plan.
 - b. cargo load, the loading aids, and cargo manifests.
 - c. cargo load, aircraft cargo compartment, and loading aids.
 - d. load team members, the aircraft cargo compartment, and the cargo manifests.

88. (227) You are within 10 feet of an aircraft. In which zone are you?
- a. Clear.
 - b. Spotter.
 - c. Loading.
 - d. Engine operations.
89. (227) You are driving a Next Generation Small Loader (NGSL) and the spotter communicates the signal shown in figure T-1. What must you do?



- a. Stop.
 - b. Shut down.
 - c. Slow down.
 - d. Tilt mast back.
90. (227) You are operating a 60K loader and the spotter communicates the signal shown in figure T-2. What is the spotter telling you to do?



- a. Roll right.
 - b. Right turn.
 - c. Side shift right.
 - d. Front yaw right.
91. (228) Non-unitized warehouse skids or individual containers of explosives will be secured to forklifts for movement. The exemption for this is when
- a. bumped cargo requires expeditious movement.
 - b. movement is within the 25 feet circle of safety parameter.
 - c. container skids/pallets have integral 360 degree tine enclosures.
 - d. shift supervisor declares supplemental restraint to be in "relaxed" conditions.
92. (229) You are loading passengers on a C-17 in which several pallets are loaded. At a *minimum*, how many inches away must your passengers sit from the palletized cargo?
- a. 10.
 - b. 20.
 - c. 30.
 - d. 40.

93. (229) You and your team are loading very heavy pallets on a C-5. Which of the following is the correct way to load the pallets?
- a. Load team personnel pulling them.
 - b. Load team personnel pushing them.
 - c. Gravity feeding them from the K-loader.
 - d. Pushing the pallets out of control at excessive speeds.
94. (230) How many 10,000-pound (lb) chains would you use to restrain a vehicle weighing 12,380 lbs for the forward direction when the vehicle is restrained to the floor of a C-17?
- a. 2.
 - b. 3.
 - c. 4.
 - d. 6.
95. (230) How many 25,000-pound (lb) chains would you use to restrain a piece of cargo weighing 17,700 lbs for the vertical direction when the cargo is restrained to the floor of a C-5?
- a. 2.
 - b. 3.
 - c. 4.
 - d. 6.
96. (230) Up to how many angles does tie down provide restraint for when applied properly?
- a. One.
 - b. Two.
 - c. Three.
 - d. Four.
97. (231) During engine running on/offload (ERO) operations, when are passengers loaded on the aircraft?
- a. After the ramp cargo is loaded.
 - b. After all of the cargo is loaded.
 - c. Before all of the cargo is loaded.
 - d. Before the ramp cargo is loaded.
98. (232) If concurrent operations are already in progress, load team chiefs and other personnel must report to whom prior to entering the area?
- a. Loadmaster.
 - b. Ramp coordinator.
 - c. Concurrent servicing supervisor (CSS).
 - d. Air Terminal Operations Center (ATOC) senior controller.
99. (232) Before performing any concurrent servicing operations, who is required to ground themselves to a suitable grounding point or a bare, unpainted portion of the aircraft?
- a. The loadmaster only.
 - b. All personnel involved in the operation.
 - c. The loadmaster and load team chief only.
 - d. The concurrent servicing supervisor (CSS) only.

100. (232) When can passengers enter or exit an aircraft during concurrent servicing operations?
- a. When a jet way or stairs are used and refueling operations are on the opposite side of the aircraft.
 - b. When a jet way or stairs are used and refueling operations are on the same side of the aircraft.
 - c. When the cargo load team chief tells them to.
 - d. Never.

Student Notes

Glossary

Abbreviations and Acronyms

AA&E	arms, ammunition, and explosives
ACA	airlift clearance authority
A/DACG	arrival/departure airfield control group
ADLS	Advanced Distance Learning System
ADS	aerial delivery system
AE	aeromedical evacuation
AFI	Air Force instruction
AFMAN	Air Force manual
AID	Agency for International Development
ALOC	air line of communication
AMC	Air Mobility Command
AMCI	Air Mobility Command instruction
AMT	aerial mail terminal
AOR	area of responsibility
APC	aerial port codes
APEX	aerial port expeditor
APOD	aerial port of debarkation
APOE	aerial port of embarkation
AT	all terrain
ATCMD	Advanced Transportation Control and Movement Document
ATGL	air transportable galley/lavatory
ATM	air terminal manager
ATOC	Air Terminal Operations Center
ATTLA	Air Transportability Test Loading Agency
C	Celsius
CART	contingency assets recovery teams
C/B	center of balance
CBFFE	center of balance from the front end
CBL	commercial bill of lading
CCDR	combatant commander
CCP	consolidation and containerization point
CDC	career development course
CETS	contract engineering and technical services

CFR	Code of Federal Regulations
CIS	Constant Surveillance and Custody Service
CMOS	cargo movement operations system
CONEX	container express
CONUS	continental United States
CSB	customer service branch
C/SH	commodity/special handling
CSS	concurrent servicing supervisors
°	degrees
D	distance
DAAS	Defense Automatic Addressing System
DCS	Defense Courier Service
DD	Department of Defense
DDP	Duel Driver Protective Service
DEROS	date eligible for return from overseas
DIC	document identifier code
DLA	Defense Logistics Agency
DOD	Department of Defense
DODAAC	DOD activity address code
DOT	Department of Transportation
DTR	defense transportation regulation
DTS	Defense Transportation System
DVD	direct vendor delivery
EOD	explosive ordnance disposal
EPA	Environmental Protection Agency
ERO	engine running on/offload
ETA	estimated time of arrival
ETD	estimated time of departure
F	Fahrenheit
FAW	front axle weight
FMS	foreign military sales
FOD	foreign object damage
FOH	front overhang
FSS	forward supply system
ft.	feet
FY	fiscal year

G	force of gravity
GATES	Global Air Transportation Execution System
GBL	government bill of lading
GMT	Greenwich Mean Time
GW	gross weight
H	height
HAZMAT	hazardous materials
HC/D	Hazard Class and Division
HMIF	HAZMAT Information Files
HQ	headquarters
HR	human remains
IAW	in accordance with
ICODES	Integrated Computerized Deployment System
ID	identification
IDS	integrated deployment system
ISU	internal slingable unit
ITO	installation transportation office
ITV	in-transit visibility
JA/ATT	joint airborne and air transportability training
JI	joint inspection
kg	kilogram
L	length
lb.	pound
LGS	logistic rail system
M	meter
MAJCOM	major command
MAW	middle axle weight
MGP	Military Guard Personnel
MHE	materials handling equipment
MICAP	mission capable/mission capability
MIL-STD	military standard
MILSTRIP	military standard requisitioning and issue procedure
MK	Mark series
ml	milliliter
MOD	modified platform
MOM	military official mail

MRSP	Mobility Readiness Spares Package
MSL	military shipment label
NAF	nonappropriated fund
NMCS	nonmission capable, supply
NOK	next of kin
NSN	national stock number
NWRM	nuclear weapons related materials
OAL	overall length
OCONUS	outside the continental United States
ORA	operational risk assessment
ORM-D	other regulated materials-domestic
OSD	Office of the Secretary of Defense
oz	ounce
POD	port of debarkation
POE	port of embarkation
POV	privately owned vehicle
PPE	personal protective equipment
psi	pounds per square inch
PSS	Protective Security Service
RAW	rear axle weight
RDD	required delivery date
RDL	reference data line
RF	radio frequency
RFI	request for information
RFID	radio frequency identification
RM	risk management
ROH	rear overhang
RO/RO	roll on/roll off
S/A	space available
SA	security assistance
SAAM	special assignment airlift mission
SAP	Security Assistance Program
SDD	standard delivery date
SDDC	Military Surface Deployment and Distribution Command
SDDG	Shipper's Declaration for Dangerous Goods
SEI	special experience identifier

SET	system entry time
S/R	space required
SSA	supply support activity
SSN	Social Security number
TAC	transportation account code
TACC	tanker airlift control center
TCMD	Transportation Control and Movement Document
TCN	transportation control number
TDD	time-definite delivery
TDR	transportation discrepancy report
TDS	tag docking station
TMDS	Table Management Distribution System
TMF	traffic management flight
TMO	traffic management office
TO	technical order
TP	transportation priority
TPS	Transportation Protective Service
TWCF	Transportation Capital Working Fund
UIC	unit identification code
ULN	unit line number
UN	United Nations
UPS	United Parcel Service
USCENTCOM	United States Central Command
USDA	US Department of Agriculture
USPS	US Postal Service
USTRANSCOM	United States Transportation Command
VVIP	very, very important parts
W	width or weight
WAAR	Wartime Aircraft Activity Report
WB	wheel base
WPM	wood packing material
WRM	war readiness materiel

Student Notes

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AFSC 2T251
2T251 02 1611
Edit Code 04