

# CHAPTER 1

## INTRODUCTION

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 PURPOSE**

The purpose of this manual is to provide crews operating the C-295 aircraft, and personnel involved in airlift and airdrop missions, with sufficient information and data to enable them to load, secure, and offload all types of cargo safely and efficiently, and to explain them the principles and restrictions governing these operations.

#### **1.2 CONTENTS**

This manual contains descriptions and physical characteristics of the standard C-295 military transport aircraft.

Directions are given for different items installation, along with complete instructions for preparing the aircraft and all auxiliary equipment required for each mission. Procedures for preloading, onloading and offloading all kinds of cargo, including personnel and equipment airdrop, are provided. Amplified step-by-step checklists for each type of mission are supplied.

General rigging procedures on the ground for airdrop, and assembling of parts, such as platforms, parachutes, etc., are beyond the scope of this manual. Refer to appropriate manufacturer handbooks or other command approved technical manuals for maintenance, setting of systems, and general rigging methods.

#### **1.3 USE**

This manual is prepared specifically for use by loadmasters and ground cargo-handling personnel. It provides information that will enable them to perform their work safely and efficiently. Information is presented in the sequence in which it is most likely to be required for use throughout the mission.

#### **1.4 DEVIATIONS AND WAIVERS**

The capacities and limitations outlined in this manual must not be exceeded, and procedures must be carefully followed. A waiver must be obtained from appropriate MAJCOM before attempting any operation which deviates from the procedures or exceeds the limits contained herein.

#### **1.5 ARRANGEMENT OF THE MANUAL**

This manual is divided into seven main chapters, each of them covering general categories of information. Where appropriate, main chapters are divided into sections that present specific aspects or different alternatives related to each category. Paragraphs are identified with the number of chapter in which they are included, followed by number of order and title. There is a table of contents at the beginning of each chapter, showing information in the order in which it appears throughout the chapter.

#### **1.6 CHAPTER 1 - INTRODUCTION**

This chapter contains the purpose, contents, use, and arrangement of the manual, as well as guidelines for looking up and finding information and data. An explanatory glossary of terms, as they are used in this manual, is also included.

## **1.7 CHAPTER 2 - DESCRIPTION OF AIRCRAFT FEATURES**

This chapter contains a general description of the standard cargo cabin, including its profile and cross sections, loading capabilities, doors, exits, cargo floor and ramp capabilities, tiedown fittings, seat and litter provisions, and stowage provisions for mission equipment. Location of different areas and frames are identified, and a description of the loading aids used with the aircraft is also included.

## **1.8 CHAPTER 3 - AIRCRAFT CONFIGURATION**

This chapter contains standard C-295 operation for doors and exits, installation of cargo/personnel carrying equipment, as well as installation and operational checks for the cargo handling system and aerial delivery provisions.

## **1.9 CHAPTER 4 - GENERAL LOADING PROCEDURES**

This chapter contains general instructions for cargo size limitations, center of gravity computations, weight and balance factors and formulas, shoring requirements, restraint criteria, vehicle loading, and winching procedures. This chapter also provides methods for onloading and offloading. With the exception of airdrop procedures, which are covered in CHAPTER 7, at the end of this chapter, there is a summary of the information presented in preceding chapters in an amplified loading/offloading checklist format.

## **1.10 CHAPTER 5 - EMERGENCY PROCEDURES**

This chapter contains emergency procedures, such as inflight jettisoning preparation, jettisoning procedures, and descriptions of emergency equipment and exits.

## **1.11 CHAPTER 6 - SPECIFIC PROCEDURES**

This chapter contains general guidelines for establishing procedures to configure the aircraft, onload, tiedown and, offload outsized or special cargoes which are to be airlifted in a routine basis.

## **1.12 CHAPTER 7 - PERSONNEL AND EQUIPMENT AIRDROP PROCEDURES**

This chapter contains specific instructions for preloading, inspecting, onloading, and on-the-aircraft rigging procedures for the aerial delivery of personnel and cargo. General descriptions on commonly used hardware and materials are given. This chapter is divided into sections covering particular procedures for each type of airdrop, including applicable amplified checklists:

Section 1 - Personnel airdrop

## **1.13 CHECKLISTS**

As stated before, this manual contains amplified step-by-step checklists for both airlift and airdrop operations. The amplified checklist establishes actions to perform each task in a particular sequence, and explains risks and precautions to be observed. Loadmasters must be thoroughly familiar with the amplified checklist, and should use an abbreviated version as a guide throughout every mission.

## 1.14 APPLICABILITY

These documents are fully applicable to the mentioned aircraft, except for the information located between asterisks which is only applicable under specific conditions. Two asterisks followed by the text "applicability" indicates that the following information has to be taken into account only for the mentioned conditions. Later, other two asterisks indicate that the text is no longer restricted for any specific conditions and the information is useful again for all aircrafts. The applicability is:

- **For AM##:** only for aircraft version AM##.
- **For MSN XXX:** only for manufacturer serial number XXX aircraft.
- **Pre SB295-YY-ZZ:** only for aircraft with Service Bulletin SB295-YY-ZZ not applied.
- **Post SB295-YY-ZZ:** only for aircraft with Service Bulletin SB295-YY-ZZ applied.

## 1.15 USE OF WARNING, CAUTION, AND NOTE

The following definitions apply to WARNINGS, CAUTIONS, and NOTES found in this manual:

**WARNING:** REMARKS ON OPERATING PROCEDURES, LIMITATIONS, TECHNIQUES, ETC., WHICH MAY RESULT IN PERSONNEL INJURY OR LOSS OF LIFE IF NOT CAREFULLY OBSERVED.

**CAUTION:** REMARKS ON OPERATING PROCEDURES, LIMITATIONS, TECHNIQUES, ETC., WHICH MAY RESULT IN DAMAGE TO EQUIPMENT IF NOT CAREFULLY OBSERVED.

**NOTE:** Remarks on procedures, techniques, etc., which are considered essential to emphasize.

## 1.16 USE OF SHALL, WILL, MUST, MAY, AND SHOULD

The following definitions indicate the difference between SHALL, WILL, MAY and SHOULD as they are used in this manual:

- SHALL, WILL, and MUST are used to indicate a mandatory requirement.
- MAY indicates an acceptable or suggested method or condition.
- SHOULD indicates non-mandatory provisions.

## 1.17 REVISIONS

Whenever necessary, Airbus will update the information contained in this manual by issuing new pages to replace the modified ones. It is the responsibility of the individuals or organizations that assigned a copy of this manual to keep their copies up to date.

Documentation updates are carried out using the following types of revisions:

- **Basic Revisions:** periodically issued, they cover not-urgent amendments, changes or updates. They also contain instructions for their insertion into the manual, and replacements for the list of effective pages.
- **Temporary Revisions:** covering any urgent amendment, they are printed on yellow paper. They include a transmittal letter (also printed on yellow paper) which contains the instructions for the insertion of the revised pages into the manual, and which serves as a record sheet of temporary revisions for control purposes.

## **1.17 LET US KNOW**

Every effort is made to improve the contents of this manual and keep it alive. However, we cannot correct an error or modify a procedure unless we have continuous feedback from operators about their hands-on, day-after-day experience. In this regard, we encourage users to let us know their comments, experiences and suggestions, as well as any questions that may arise concerning the contents of this manual. Please, mail your comments to:

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## **1.18 GLOSSARY**

**NOTE:** Definitions are given in this glossary for words, phrases, abbreviations, and acronyms. They are not necessarily general definitions and may be applicable only to the word, statement or sentence as they are used in this manual, context of loading-offloading, or airdrop related operations.

### **ACB**

Attitude Control Bar. Bar used in LAPE loads to control the platform attitude during cargo landing.

### **ADS**

Aerial Delivery System. Equipment and characteristics which enable the aircraft to perform airdrop of personnel and cargo.

### **AGL**

Above Ground Level. Vertical distance from the aircraft inflight to ground level.

### **AIRDROP**

The aerial delivery of personnel and/or cargo.

### **ARM**

The horizontal distance from a given reference to the center of balance or fulcrum of an item.

### **AXLE WEIGHT**

The weight imposed on an axle of a vehicle, regardless of the number of wheels.

### **BASIC WEIGHT**

Aircraft empty weight which is taken as initial weight to figure out aircraft weight and balance for a mission.

### **BL**

Butt Line. An imaginary plane, perpendicular to the cargo floor and parallel to the aircraft centerline. Butt lines identify lateral positions in terms of distance from the centerline of the aircraft. Notations should include "BL <distance> R or L" for right and left, respectively.

### **BULK LOAD**

Non-palletized or wheeled load imposed directly on the cargo floor.

### **BULKHEAD**

A partition or wall separating one part of the fuselage from another.

### **BSA**

Buffer Stop Assembly. Forward restraint barrier used in a CDS airdrop.

### **BUNDLE**

An individual container rigged for gravity airdrop.

**CB**

Center of Balance. The point at which an item will rotate when balanced.

**CDS**

Container Delivery System.

**CG RANGE**

The portion of the Mean Aerodynamic Chord within which the overall aircraft center of gravity must be located to fly.

**CG**

Center of Gravity. The point at which the mass of a body or object is statically balanced.

**CGA**

Center of Gravity Arm. Expression of the aircraft CG location in terms of distance to the Reference Datum Line.

**CHADS**

Cargo Handling and Aerial Delivery System. AM109 dual rail system for airlift of palletized cargo and airdrop.

**COMBINATION AIRDROP**

See Mixed Airdrop.

**CONCENTRATED LOAD**

A load which rests on the cargo floor on a small area when compared to the total size and weight of the package.

**CONSECUTIVE AIRDROPS**

Airdrops on the same or different drop zones which require closing doors and inflight rigging operations.

**DEPLOY/DEPLOYMENT**

Action of a line or parachute getting full length, size or shape.

**DLB**

Drogue Line Bag. Used in LAPE airdrop to store and deploy the drogue line.

**DROGUE**

Parachute that is deployed and towed during the final approach on a LAPE airdrop, and which ultimately extracts and helps in the deployment of the actual extraction parachute.

**EFTC**

Extraction Force Transfer Coupling. Extraction system used in Heavy Equipment airdrop.



**EJECTION**

Act of throwing out of an aircraft.

**ELB**

Extraction Line Bag. Used in LAPE airdrop to store and deploy the extraction line.

**ELDB**

Extraction Line Deployment Bag. Used in HE airdrop to store and deploy the extraction line.

**EXTRACTION**

Act of pulling out of an aircraft by means of a parachute.

**FORCE**

An influence that produces or tends to produce motion or change of motion.

**FR**

Frame. A transversal structural member strengthening the fuselage. Frames are numbered in the aircraft to serve as position references.

**GEP**

Gravity Ejected Platforms.

**HAARS**

High Altitude Air Resupply System. CDS airdrop performed at high altitude.

**HAZARDOUS CARGO**

Any material which, due to its nature, properties, packaging, or quantity may endanger human health, life or properties, and that is so defined and listed by United Nations.

**HE**

Heavy Equipment low velocity extraction airdrop.

**HONEYCOMB**

Shock absorbing material.

**IAW**

In Accordance With.

**ITEM EXTRACTED LOAD**

HE or LAPE load for which extraction force is applied to a substantial enough, so designated point of the load.

**JETTISON**

Act of throwing some load or aircraft equipment overboard, especially to lighten an aircraft, as part of the actions to solve out an emergency situation.

## **LAPES**

Low Altitude Parachute Extraction System.

## **LB**

Pounds.

## **LEMAC**

Leading Edge of Mean Aerodynamic Chord.

## **LINEAR FOOT**

A longitudinal strip of cargo floor measuring one foot fore and aft by any width, up to the full width of the cargo floor.

## **LINEAR METER**

A longitudinal strip of cargo floor measuring one meter fore and aft by any width, up to the full width of the cargo floor.

## **LINKED PLATFORMS**

See tandem airdrop.

## **MAC**

Mean Aerodynamic Chord.

## **MAJCOM**

Major Command. Person or organization under whose authority operations are carried out.

## **MARRIED PALLETS**

Pallets joined together, by means of their own rings and special metallic links, to obtain a base support to transport load units longer than a single pallet.

## **MIXED AIRDROP**

An airdrop operation in which personnel jump immediately after the exit of one or more airdrop loads from the same aircraft.

## **MSL**

Mean Sea Level

## **MULTIPLE PASSES**

A single airdrop during which the aircraft performs several drops without additional rigging, or closing side doors or ramp and cargo door.

## **MZFW**

Maximum Zero Fuel Weight. Maximum permissible weight, including operating weight, plus passengers and payload before adding fuel.

**OPERATING WEIGHT**

Basic aircraft weight plus crew, additional and extra equipment, and any other item in the aircraft different from fuel and payload.

**PALLETIZED CARGO**

Cargo placed and restrained on a pallet.

**PERCENTAGE OF MAC (%MAC)**

Expression of the aircraft CG location in terms of percentage from the Leading Edge of Mean Aerodynamic Chord.

**PILOT PARACHUTE**

A small parachute which helps in the deployment of a larger parachute.

**PLATFORM EXTRACTED LOAD**

HE or LAPE load for which extraction force is applied to the platform.

**RDL**

Reference Datum Line. A vertical imaginary plane at or ahead of the nose of the aircraft, perpendicular to the longitudinal axis, from which all horizontal distances are measured.

**REEFED PARACHUTE**

Parachute equipped with a reefing line.

**REEFING LINE**

Line used around the outer edge of a parachute canopy to decrease extraction force or delay full deployment.

**RESTRAIN**

Using devices to avoid movement of an item in the aircraft.

**RESTRAINT**

Effect of restraining, usually expressed in terms of achieved or required quantity.

**RIG**

To prepare, assemble, install or configure a load or aircraft equipment.

**RIGGED WEIGHT**

Total weight of an airdrop load, including its support base, cargo parachutes, risers, tiedowns, etc.

**RIGGING MANUAL**

A handbook containing directions to rig a certified airdrop load.

**SEQUENTIAL AIRDROP**

Airdrop of several HE loads in a single pass.

## **SHORING**

Wooden materials placed under a piece of equipment, usually to prevent damage to the cargo floor, or under the cargo ramp to decrease the ramp slope due to crest or projection limitations.

## **SL/CS**

Static Line/Connector Strap. Extraction system used in Heavy Equipment Airdrop.

## **STA**

Fuselage Station. An imaginary plane perpendicular to the cargo floor and the longitudinal axis. Stations identify longitudinal positions in terms of distance from the reference datum line (RDL).

## **STRAND**

A length of cord or wire secured at each end.

## **SUSPENDED WEIGHT**

The weight of an airdrop load, excluding the weight of the suspension system.

## **SYMMETRICAL**

Regular in form or arrangement of corresponding parts in respect of a center reference line.

## **TAILGATING**

Airdrop of parachutists from the cargo ramp.

## **TANDEM AIRDROP**

A LAPE airdrop during which several linked platforms are extracted with a single extraction system.

## **TIEDOWN DEVICE**

A device specifically certified for applying restraint to cargo items within the aircraft.

## **TONGUE LOAD**

Weight imposed on the cargo floor along the vertical axis of the tongue when the tongue is allowed to contact the floor.

## **TOW**

Takeoff weight. Weight which includes operating weight plus fuel weight at takeoff plus payload.

## **UNASSISTED**

Operation not requiring any additional personnel/equipment.

## **UNIFORM LOAD**

A load which is evenly distributed over entire area.

## **ZFW**

Zero Fuel Weight. Weight which includes operating weight plus payload.