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1.1 Scope

This document provides, in a standardized format, airplane characteristics data for general airport planning. Since operational practices vary among airlines, specific data should be coordinated with the using airlines prior to facility design. The Boeing Commercial Airplane Company should be contacted for any additional information required.

Content of the document reflects the results of a coordinated effort by representatives from the following organizations:

- Aerospace Industries Association
- Airport Operators Council International
- Air Transport Association of America
- International Air Transport Association

The airport planner may also want to consider the information presented in the "CTOL Transport Aircraft, Characteristics, Trends, and Growth Projections," available from the U.S. AIA, 1725 De Sales Street N.W., Washington, DC 20036, for his long-range planning needs. This document is updated periodically and represents the coordinated efforts of the following organizations regarding future aircraft growth trends:

- International Coordinating Council of Aerospace Industries Associations
- Airport Operators Council International, Inc.
- Air Transport Association of America
- International Air Transport Association

1.2 Introduction

This document conforms to NAS 3601. It provides characteristics of the Boeing Model 747 family of airplanes for airport planners and operators, airlines, architectural and engineering consultant organizations, and other interested industry agencies. Airplane changes and available options may alter model characteristics; the data presented herein reflect typical airplanes in each model category.

For additional information contact:

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1.3 747 Family Comparison, A Brief Description

The Boeing Commercial Airplane Company offers the 747 in various commercial versions as follows:

<u>Model Number</u>	<u>Airplane Configuration</u>
747-100, -100B	Passenger Airplane; 710,000-lb (322,000-kg) to 750,000-lb (340,100-kg) takeoff weight. The -100 is no longer in production.
747-100SR	High-capacity, short-range Passenger Airplane; 520,000-lb (235,800-kg) or 600,000-lb (272,100-kg) takeoff weight.
747-100SF	Special Freighters; Model 747-100's retrofitted to carry an all-cargo load.
747-200	Growth versions of the 747-100; details below.
747-200B	Passenger Airplane; 775,000-lb (351,500-kg) to 833,000-lb (377,800-kg) takeoff weight.
747-200B Combi	Similar to the 747-200B except for a left-side main-deck cargo door, aft of the wing, for loading of palletized or containerized cargo.
747-200C	Similar to the 747-200B except for a nose cargo door and an optional main-deck side cargo door. It is convertible to partial or total cargo configuration.
747-200F	Freighter Airplane; 775,000-lb (351,500-kg) to 833,000-lb (377,800-kg) takeoff weight. It has a nose cargo door and an optional main deck side cargo door.
747-300	The -300 option features an extended upper deck for increased passenger capacity.
747SP	Reduced passenger capacity, special performance version of the 747-100 Passenger Airplane with 630,000-lb (285,700-kg) to 696,000-lb (315,600-kg) takeoff weight.

747-100, -100B

The earlier 747-100s used Pratt & Whitney JT9D-3A engines with 43,500-lb (19,730-kg) thrust each while later versions used the JT9D-3AW engines with increased thrust. The 747-100s were developed to take advantage of the airplane's structural capability as determined in static structural tests. New engines with higher thrusts also became available, and the maximum ramp weight was increased. These changes make possible operation with longer range, greater payload, or combination of the two.

747-100B SR

The SR (short range) option to the 747-100B is designed specifically to fill the need for a high-capacity transport on short routes. This airplane is structurally strengthened to permit twice as many landings in 20 years of short-range flights, yet retain its long-range capability. Interior arrangement allows for more seats and fewer galleys.

747-100SF

The SF (special freighter) airplane is an earlier 747-100 passenger airplane retrofitted to carry an all-cargo payload. Retrofit includes installation of a main-deck side cargo door and associated cargo handling mechanism. Also floor deck structure is strengthened to carry the additional load. The -100SF has virtually the same cargo space as the -200F.

747-200B

The 833,000-lb (377,800-kg) maximum-takeoff-weight airplane can carry 452 passengers in a mixed-class configuration more than 5,500 nmi nonstop. It is powered by advanced JT9D-7 engine derivatives, General Electric CF6-50, or Rolls-Royce RB211-524 engines with rated thrusts to 54,000 lb (24,490 kg).

747-200B Combi

The Combi airplane has the same characteristics as the 747-200B, except the Combi has a main-deck side cargo door installed on the left side, aft of the wing, for loading palletized or containerized cargo. The Combi can be converted to either an all-passenger or a passenger/cargo configuration. In the latter configuration, cargo is in the aft fuselage and is either 6 or 12 cargo modules. An optional 7th or 13th cargo module location is also available. Other cargo module combinations can be loaded compatible with size limits and operational procedures. The Combi is not convertible to an all-cargo configuration.

747-200C

The 747-200C is convertible to all-passenger, all-cargo, or one of several passenger/cargo configurations. In the passenger configuration, the 747-200C is capable of carrying passengers in the same spacious interior as that in the 747-200B. In the cargo configuration, the 747-200C functions as a main-deck cargo carrier virtually equivalent in capability to the 747-200F. Like the 747-200F, the 747-200C has a main-deck nose door for straight-in cargo loading. An optional main-deck side-cargo door allows for loading dimensionally taller cargo modules. In the passenger/cargo configuration, the passengers are in the aft fuselage.

747-200F

The 747-200F freighter has a main-deck nose door and a mechanized cargo-handling system on the main deck. The nose swings up so that pallets or containers, in lengths to 40 ft (12.19m), can be loaded straight in on motor-driven rollers. Two men, one at the nose door control and one inside the airplane, can complete the unload-and-load cycle in about 30 minutes. An optional main-deck side-cargo door allows for loading dimensionally taller cargo modules.

747-300, -300 SR, -300 Combi

The 747-300 features an extended upper deck to provide additional passenger capacity. The -300 also features aft-facing stairs aft of the No. 2 door for access to the upper deck. Two full-size doors on the upper deck provide emergency exit for the upper deck passengers. The -300 option is available on new airplanes as well as for retrofit on existing -100B, -200B, and Combi airplanes.

747SP

The 747SP (special performance) airplane is 48 ft 5 in. (14.78m) shorter than the standard 747 airplane. It can fly higher, faster, and farther than any wide-body aircraft, and as a result serves well on long-distance air routes that do not require airplanes the size of the standard 747. A high degree of parts commonality exists between the 747SP and the 747.

Main-Deck Side Cargo Door

An optional main-deck cargo door is available on the 747 (except SP). Designed for new airplanes as well as for retrofit on 747s now in service, the cargo door is located aft of the wing on the main deck between the fourth and fifth passenger doors on the left side. If installed on passenger aircraft, containerized or palletized cargo can be loaded in the aft fuselage during periods of light passenger traffic. A ball-transfer floor panel, cargo roller tracks and tiedowns, and cabin divider for passenger/cargo combination loads complete the installation.

If installed on the freighter, dimensionally taller loads (e.g., IATA type 2H containers) can be loaded. These containers cannot be loaded through the nose cargo door.

Several 747-100 airplanes have been retrofitted to incorporate the side cargo door for freighter applications. These airplanes have been redesignated as 747-100SF (special freighter).

Upper Deck Seating

The basic seating arrangement in the upper deck can accommodate 32 economy-class seats. The seating arrangement can be increased to 45 economy-class seats with a forward-facing straight-stair option. The -300 airplane with the stretched upper deck and aft-facing straight stairs can accommodate up to 85 seats in an all economy arrangement.

Number 3 Door Deactivation

Another option on the 747 (except SP) is the deactivation of the number 3 doors. This allows space for an additional 12 passenger seats without altering the galley configuration. Full-height storage closets could be installed instead of the additional 12 seats.

Engine and Ramp Weight Combinations

Power for the 747 aircraft can be selected from a wide variety of engines. The following table shows engine choices for corresponding models and ramp weights.

Document Page Applicability

Pages in this document titled "Model 747" are applicable to all Model 747 airplanes.

Pages titled "Model 747-100B" are also applicable to airplanes with the SR option.

Pages titled "Model 747-100" are applicable to the earlier Model 747-100 airplanes.

Pages titled "Model 747-200" are applicable to 747-200B, 747-200C, and 747-200F airplanes.

Pages titled "Model 747-200B" are also applicable to airplanes with the Combi option.

Pages titled "Model 747-300" are also applicable to -100B and -200B airplanes retrofitted to the -300 configuration.

Pages uniquely applicable to a specific model or group of models are so marked.

		MAXIMUM RAMP WEIGHT — 1,000 LB (1,000 KG)				
ENGINE (4 EACH)	THRUST PER ENGINE	747-100, -100B -100SF	747-100B SR	747SP	747-200	747-300
JT9D-3A	43,500 LB (19,730 KG)	713 (323.4) 738 (334.7)			778 (352.8)	
JT9D-3AW	45,000 LB (20,400 KG)					
JT9D-7A JT9D-7AH	46,950 LB (21,290 KG)	713 (323.4) 738 (334.7) 753 (341.5)	523 (237.2) 573 (259.9) 603 (273.5) 613 (278.0)	636 (268.4) 666 (302.0) 676 (306.6) 696 (315.6) 703 (318.8)	778 (352.8) 788 (357.4)	
JT9D-7AW	48,570 LB (22,030 KG)					
JT9D-7F	48,000 LB (21,770 KG)			FOR-7AW & 7FW: 641 (290.7) 671 (304.3) 681 (308.8) 701 (317.9) 708 (321.1)	778 (352.8) 788 (357.4) 808 (366.4)	
JT9D-7FW	50,000 LB (22,680 KG)					
JT9D-7J	50,000 LB (22,680 KG)			778 (352.8) 788 (357.4) 803 (364.2)		
JT9D-7Q JT9D-70A	53,000 LB (24,040 KG)					
JT9D-7R4G2	54,000 LB (24,490 KG)	778 (352.8) 788 (357.4) 803 (364.2) 823 (373.2) 836 (379.1)	778 (352.8) 788 (357.4) 803 (364.2) 823 (373.2) 836 (379.1)			
RB211-524D4	53,100 LB (24,090 KG)					
RB211-524B2	50,100 LB (22,720 KG)	713 (323.4) 738 (334.7) 753 (341.5)	523 (237.2) 574 (260.3) 603 (273.5)	636 (288.4) 666 (302.0) 676 (306.6) 696 (325.6) 703 (318.8)		
RB211-524C2	51,500 LB (23,360 KG)					
CF6-45A CF6-45A2/B2 CF6-50E2-F	46,500 LB (21,090 KG)					
CF6-50E/E1 CF6-50E2 ①	52,500 LB (23,810 KG)	778 (352.8) 788 (357.4) 803 (364.2) 823 (373.2) 836 (379.1)	778 (352.8) 788 (357.4) 803 (364.2) 823 (373.2) 836 (379.1)			

NOTES:

- RAMP WEIGHTS SHOWN ARE STANDARD AIRPLANE WEIGHTS AS OFFERED. DELIVERED AIRPLANES MAY HAVE DIFFERENT RAMP WEIGHTS. CONSULT WITH AIRLINE FOR ACTUAL ENGINE/WEIGHT COMBINATION.
- 747-300 WEIGHTS REFLECT NEW AIRPLANE CONFIGURATIONS. RETROFIT AIRPLANES MAY RETAIN EXISTING ENGINE/WEIGHT COMBINATION.
- SEE SECTION 2.1 GENERAL CHARACTERISTICS FOR DETAILS ON SELECTED COMBINATIONS.

① CF6-50E/E1 NOT APPLICABLE ON 747-300

1.3.1 BRIEF DESCRIPTION AND COMPARISON—ENGINE/WEIGHT COMBINATIONS
MODEL 747

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