Aircraft Characteristics

Narrow-body aircraft

Viscount". AirVectors. "Commercial aircraft of the world" (PDF). Flight International. 20 Nov 1959. "Airplane Characteristics for Airport Planning" (PDF). Boeing - A narrow-body aircraft or single-aisle aircraft is an airliner arranged along a single aisle, permitting up to 6-abreast seating in a cabin less than 4 metres (13 ft) in width.

In contrast, a wide-body aircraft is a larger airliner usually configured with multiple aisles and a fuselage diameter of more than 5 metres (16 ft), allowing at least seven-abreast seating and often more travel classes.

Unit load device

2018-07-31. "A321 Aircraft Characteristics - Airport and Maintenance Planning" (PDF). Airbus. Feb 2018. "707 Airplane Characteristics for Airport Planning" - A unit load device (ULD) is a container used to load luggage, freight, and mail on wide-body aircraft and specific narrow-body aircraft. It allows preloading of cargo, provided the containerised load fits in the aircraft, enabling efficient planning of aircraft weight and balance and reduced labour and time in loading aircraft holds compared with 'bulk-loading' single items of cargo or luggage by hand. Each ULD has its own packing list or manifest so that its contents can be tracked. A loaded aircraft cargo pallet secured with a cargo net also forms a ULD, but its load must be gauged for size in addition to being weighed to ensure aircraft door and hold clearances.

The IATA publishes ULD regulations and notes there are 900,000 in service worth more than US$1 billion, averaging $1100 each.

Wide-body aircraft

A wide-body aircraft, also known as a twin-aisle aircraft and in the largest cases as a jumbo jet, is an airliner with a fuselage wide enough to accommodate - A wide-body aircraft, also known as a twin-aisle aircraft and in the largest cases as a jumbo jet, is an airliner with a fuselage wide enough to accommodate two passenger aisles with seven or more seats abreast. The typical fuselage diameter is 5 to 6 m (16 to 20 ft). In the typical wide-body economy cabin, passengers are seated seven to ten abreast, allowing a total capacity of 200 to 850 passengers. Seven-abreast aircraft typically seat 160 to 260 passengers, eight-abreast 250 to 380, nine- and ten-abreast 350 to 480. The largest wide-body aircraft are over 6 m (20 ft) wide, and can accommodate up to eleven passengers abreast in high-density configurations.

By comparison, a typical narrow-body aircraft has a diameter of 3 to 4 m (10 to 13 ft), with a single aisle, and seats between two and six people abreast.

Wide-body aircraft were originally designed for a combination of efficiency and passenger comfort and to increase the amount of cargo space. However, airlines quickly gave in to economic factors, and reduced the extra passenger space in order to insert more seats and increase revenue and profits. Wide-body aircraft are also used by commercial cargo airlines, along with other specialized uses.

By the end of 2017, nearly 8,800 wide-body airplanes had been delivered since 1969, with production peaking at 412 in 2015.

List of aircraft type designators

well as an Aircraft Type Code, IATA may optionally define an Aircraft Group Code for types and variants that share common characteristics (for example - An aircraft type designator is a two-, three- or four-character alphanumeric code designating every aircraft type (and some sub-types) that may appear in flight planning. These codes are defined by both the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA).

ICAO codes are published in ICAO Document 8643 Aircraft Type Designators and are used by air traffic control and airline operations such as flight planning. While ICAO designators are used to distinguish between aircraft types and variants that have different performance characteristics affecting ATC, the codes do not differentiate between service characteristics (passenger and freight variants of the same type/series will have the same ICAO code).

IATA codes are published in Appendix A of IATA's annual Standard Schedules Information Manual (SSIM) and are used for airline timetables and computer reservation systems. IATA designators are used to distinguish between aircraft types and variants that have differences from an airline commercial perspective (size, role, interior configuration, etc). As well as an Aircraft Type Code, IATA may optionally define an Aircraft Group Code for types and variants that share common characteristics (for example all Boeing 747 freighters, regardless of series).

The following is a partial list of ICAO type designators for a range of multi-engined and turbine aircraft, with corresponding IATA type codes where available.

North American XF-108 Rapier

Museum of the United States Air Force and U.S. Standard Aircraft Characteristics General characteristics Crew: two Length: 89 ft 2 in (27.2 m) Wingspan: 57 ft - The North American XF-108 Rapier was a proposed long-range, high-speed interceptor aircraft designed by North American Aviation intended to defend the United States from supersonic Soviet strategic bombers. The aircraft would have cruised at speeds around Mach 3 (3,200 km/h; 2,000 mph) with an unrefueled combat radius over 1,000 nautical miles (1,900 km; 1,200 mi), and was equipped with radar and missiles offering engagement ranges up to 100 miles (160 km) against bomber-sized targets.

To limit development costs, the program shared engine development with the North American XB-70 Valkyrie strategic bomber program, and used a number of elements of earlier interceptor projects. The program had progressed only as far as the construction of a single wooden mockup when it was canceled in 1959, due to a shortage of funds and the Soviets' adoption of ballistic missiles as their primary means of nuclear attack. Had it flown, the F-108 would have been the heaviest fighter of its era.

Prior to the project's cancellation, U.S. President Dwight D. Eisenhower noted that raising the F-108 interceptor force would have cost the U.S. taxpayer $4 billion (equivalent to $43 billion today).

Trainer aircraft

flight characteristics and a simplified cockpit arrangement—allows pilots-in-training to safely advance their skills to a more unforgiving aircraft. Civilian - A trainer is a class of aircraft designed specifically to facilitate flight training of pilots and aircrews. The use of a dedicated trainer aircraft with additional safety features—such as tandem flight controls, forgiving flight characteristics and a simplified cockpit

arrangement—allows pilots-in-training to safely advance their skills to a more unforgiving aircraft.

Civilian pilots are normally trained in a light aircraft, with two or more seats to allow for a student and instructor.

Intelligent flight control system

system that can identify aircraft characteristics through the use of neural network technology in order to optimize aircraft performance. To develop a - The Intelligent Flight Control System (IFCS) is a next-generation flight control system designed to provide increased safety for the crew and passengers of aircraft as well as to optimize the aircraft performance under normal conditions.[1] The main benefit of this system is that it will allow a pilot to control an aircraft even under failure conditions that would normally cause it to crash. The IFCS is being developed under the direction of NASA's Dryden Flight Research Center with the collaboration of the NASA Ames Research Center, Boeing Phantom Works, the Institute for Scientific Research at West Virginia University, and the Georgia Institute of Technology.

Flight simulator

of pilots), the design and development of the aircraft itself, and research into aircraft characteristics and control handling qualities. The term "flight - A flight simulator is a device that artificially re-creates aircraft flight and the environment in which it flies, for pilot training, design, or other purposes. It includes replicating the equations that govern how aircraft fly, how they react to applications of flight controls, the effects of other aircraft systems, and how the aircraft reacts to external factors such as air density, turbulence, wind shear, cloud, precipitation, etc. Flight simulation is used for a variety of reasons, including flight training (mainly of pilots), the design and development of the aircraft itself, and research into aircraft characteristics and control handling qualities.

The term "flight simulator" may carry slightly different meaning in general language and technical documents. In past regulations, it referred specifically to devices which can closely mimic the behavior of aircraft throughout various procedures and flight conditions. In more recent definitions, this has been named "full flight simulator". The more generic term "flight simulation training device" (FSTD) is used to refer to different kinds of flight training devices, and that corresponds more closely to meaning of the phrase "flight simulator" in general English.

List of aircraft

List of aircraft (B–Be) List of aircraft (Bf–Bo) List of aircraft (Br–Bz) List of aircraft (C–Cc) List of aircraft (Cd–Cn) List of aircraft (Co–Cz) List - The lists of aircraft are sorted in alphabetical order and is broken down into multiple pages:

Stealth aircraft

aerodynamic performance. Newer stealth aircraft, like the F-22, F-35 and the Su-57, have performance characteristics that meet or exceed those of front-line - Stealth aircraft are designed to avoid detection using a variety of technologies that reduce reflection/emission of radar, infrared, visible light, radio frequency (RF) spectrum, and audio, collectively known as stealth technology. The F-117 Nighthawk was the first operational aircraft explicitly designed around stealth technology. Other examples of stealth aircraft include the B-2 Spirit, the B-21 Raider, the F-22 Raptor, the F-35 Lightning II, the Chengdu J-20, and the Sukhoi Su-57.

While no aircraft is completely invisible to radar, stealth aircraft make it more difficult for conventional radar to detect or track the aircraft effectively, increasing the odds of an aircraft avoiding detection by enemy radar

and/or avoiding being successfully targeted by radar guided weapons. Stealth is a combination of passive low observable (LO) features and active emitters such as low-probability-of-intercept radars, radios and laser designators. These are typically combined with operational measures such as carefully planning mission maneuvers to minimize the aircraft's radar cross-section (RCS), since common hard turns or opening bomb bay doors can more than double an otherwise stealthy aircraft's radar return. Stealth is accomplished by using a complex design philosophy to reduce the ability of an opponent's sensors to detect, track, or attack the stealth aircraft. This philosophy takes into account the heat, sound, and other emissions of the aircraft which can also be used to locate it. Sensors are made to reduce the impact of low observable technologies and others have been proposed such as IRST (infrared search and track) systems to detect even reduced heat emissions, long wavelength radars to counter stealth shaping and RAM focused on shorter wavelength radar, or radar setups with multiple emitters to counter stealth shaping. However these have disadvantages compared to traditional radar against non-stealthy aircraft.

Full-size stealth combat aircraft demonstrators have been flown by the United States (in 1977), Russia (in 2000) and China (in 2011). As of December 2020, the only combat-ready stealth aircraft in service are the Northrop Grumman B-2 Spirit (1997), the Lockheed Martin F-22 Raptor (2005), the Lockheed Martin F-35 Lightning II (2015), the Chengdu J-20 (2017), and the Sukhoi Su-57 (2020). a number of other countries developing their own designs. In-development aircraft include fighters such as the US' F-47 and China's J-36, as well as strategic bombers, China's H-20 and Russia's PAK DA. There are also various aircraft with reduced detectability, either unintentionally or as a secondary feature.

Stealth aircraft first saw combat when the F-117 was used in the 1989 United States invasion of Panama. Since then US, UK, and Israeli stealth aircraft have seen combat, primarily in the Middle East, while the Russian Su-57 has seen combat in the Russian invasion of Ukraine.

As of 2025, there has been one confirmed shootdown of a stealth aircraft, during the 1999 NATO bombing of Yugoslavia, of an F-117 by a Serbian Isayev S-125 'Neva-M' missile brigade commanded by Colonel Zoltán Dani, while a second incident damaged an F-117. Russia and allegedly China studied the relatively intact wreckage, which the US military considered too outdated to warrant further action.