



TECHSAVIATION

Training Center

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Introduction

Features

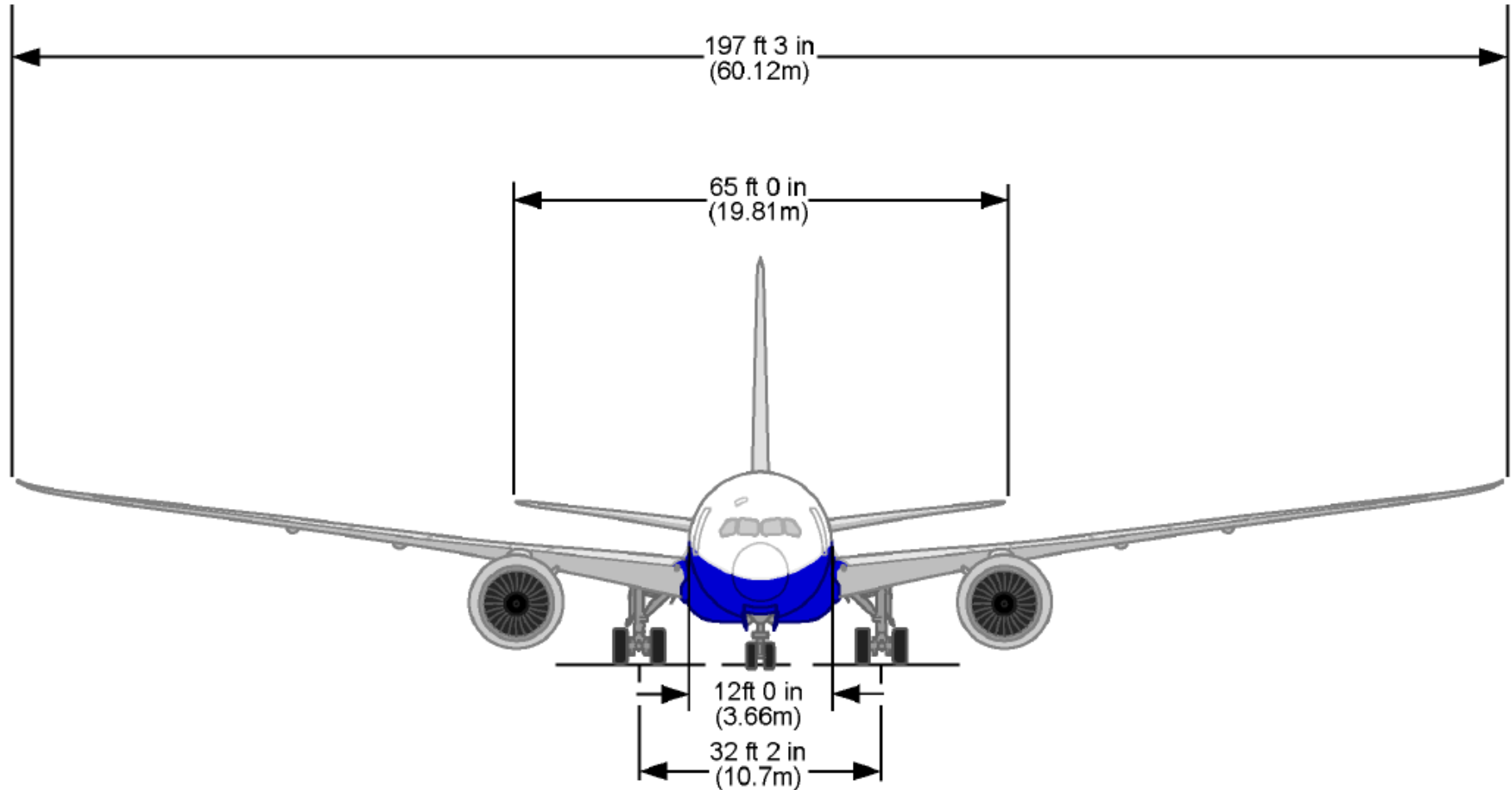
The 787 design is a twin-engine, long-range airplane with ETOPS (extended operation) certification. It is made in three models:

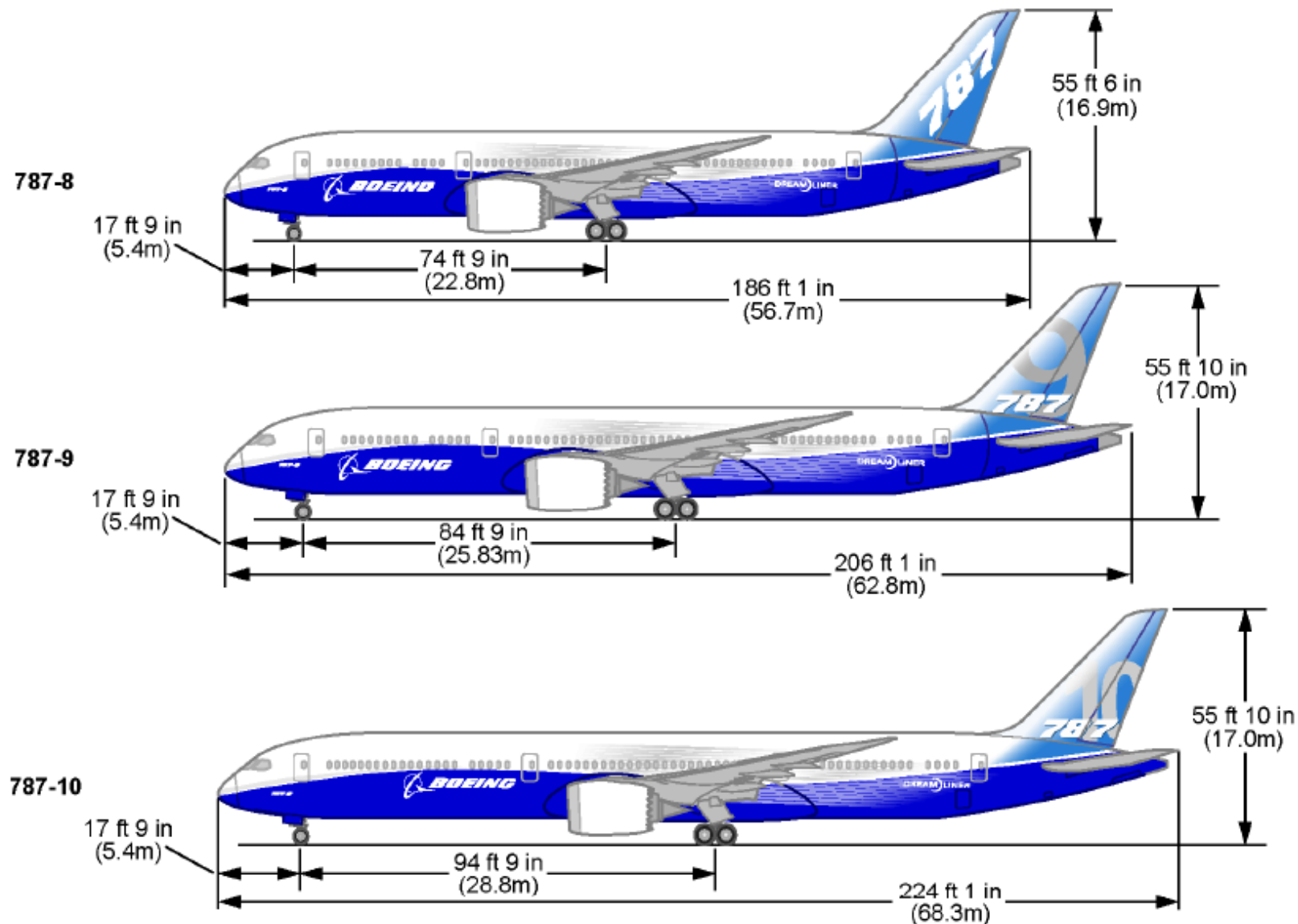
- > 787-8
- > 787-9
- > 787-10

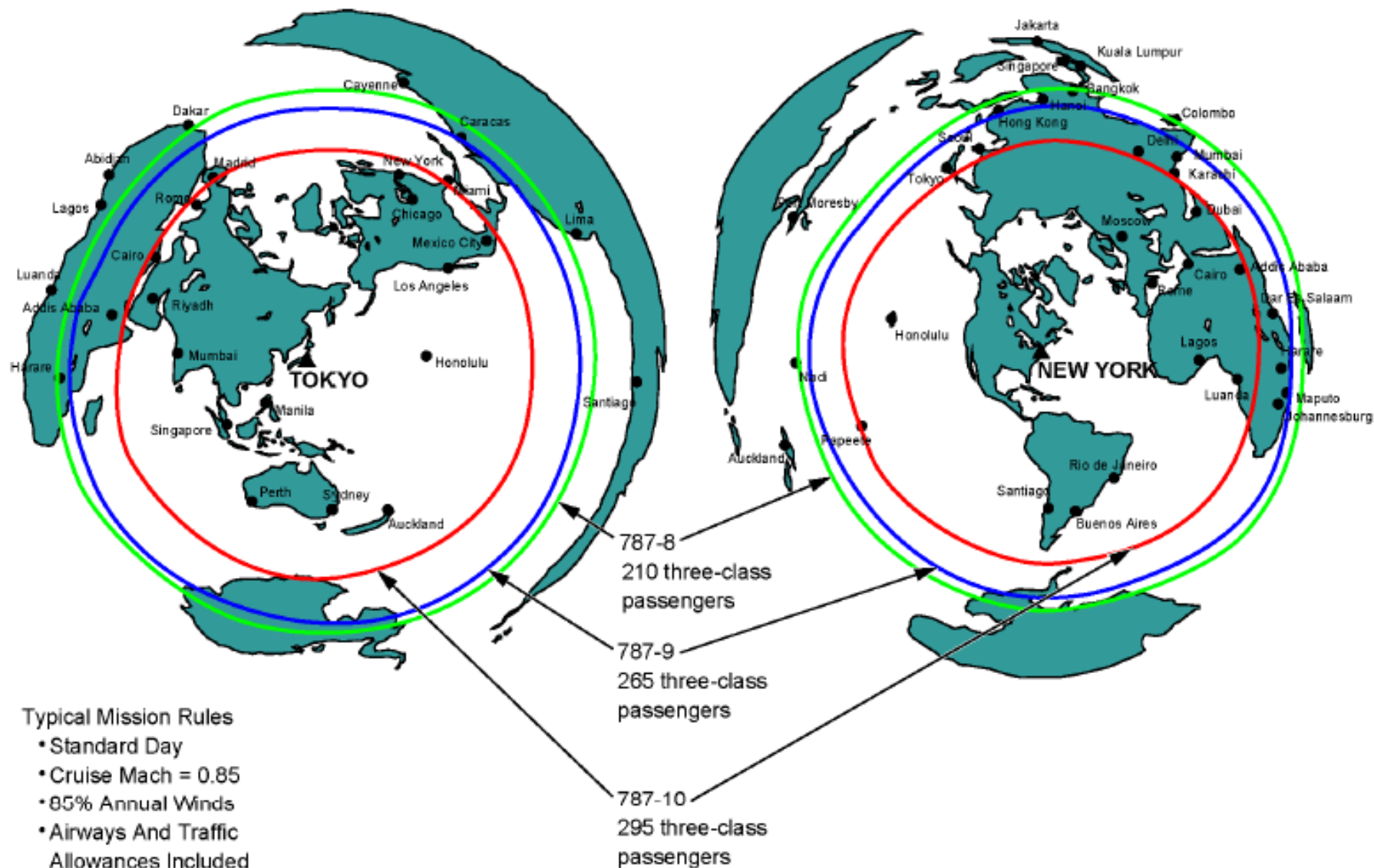
Over 50 percent of the airplane structure is made of Carbon Fiber Reinforced Plastic (CFRP) solid laminate.

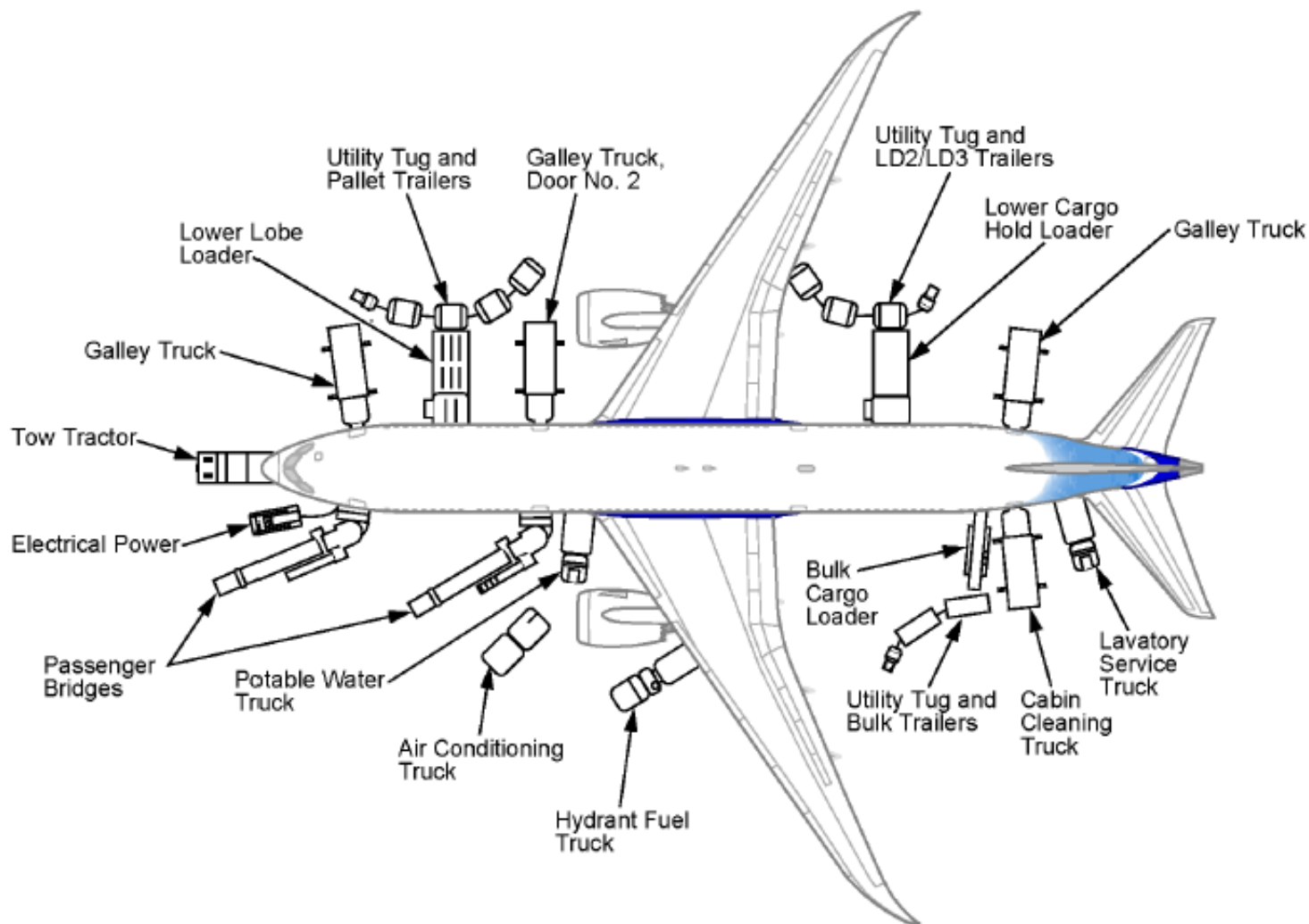
These are some of the other features of the 787:

- > Lower cabin altitude of 6,000 feet
- > Increased humidity for flight crew, cabin crew, and passenger comfort
- > Large cabin windows
- > Large-format flight deck displays
- > Integrated modular avionics
- > Fly-by-wire flight control systems
- > Hydraulic systems using 5,000 psi
- > Electrical power system with remote power distribution
- > Electronic circuit breakers
- > Electrical brake system
- > No engine pneumatic bleed extraction (except cowl anti-ice)
- > Maintenance laptop.









Airplane Servicing

Structures

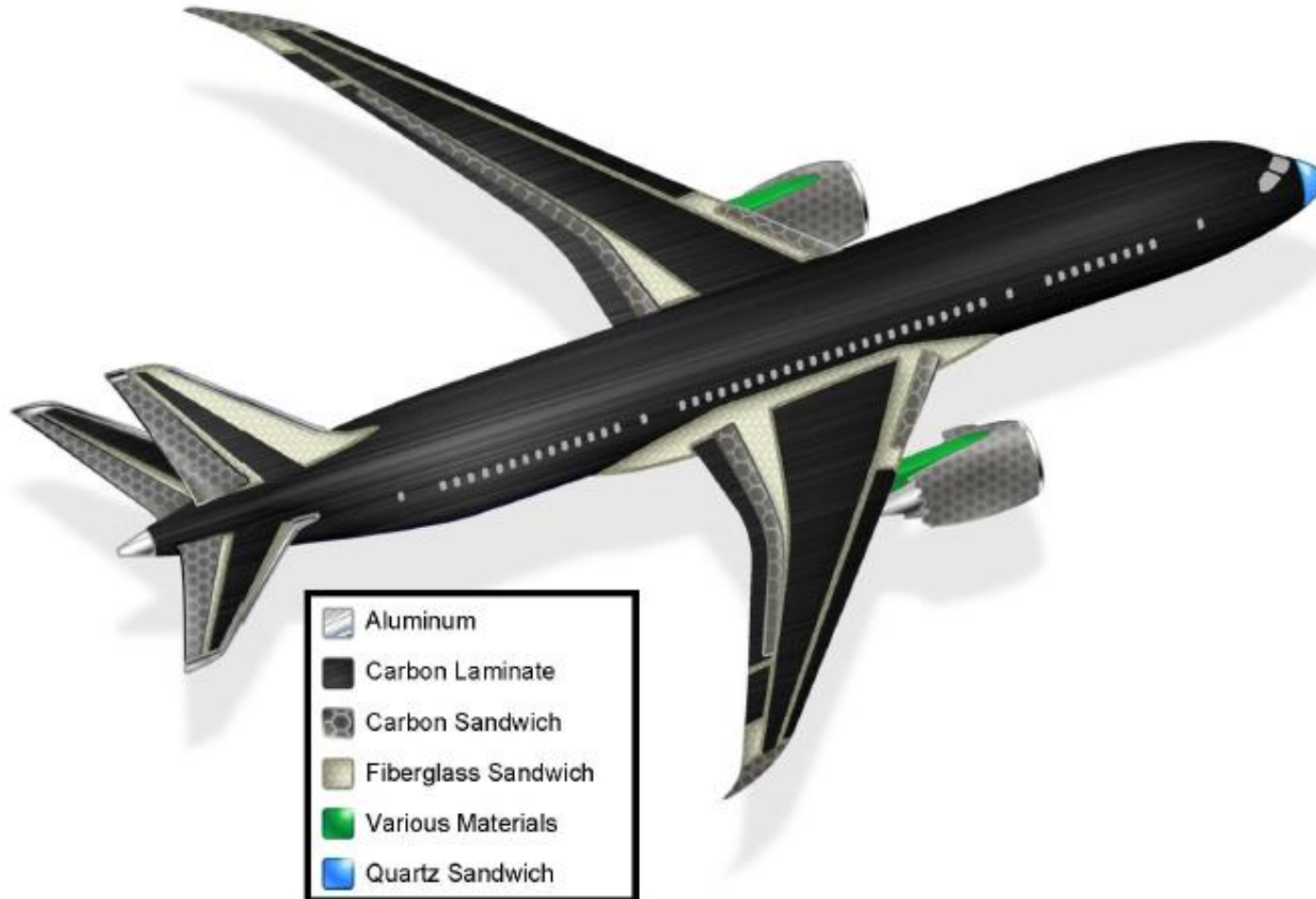
Composite Structure Applications

The airplane is made of composite materials and metals.

More than 55 percent of the airplane is composite material.

The primary materials of the airplane are:

- > Carbon Fiber Reinforced Plastic (CFRP) laminate
- > Carbon sandwich
- > Fiberglass sandwich
- > Quartz sandwich
- > Aluminum
- > Steel
- > Titanium.



Composite Structure Applications

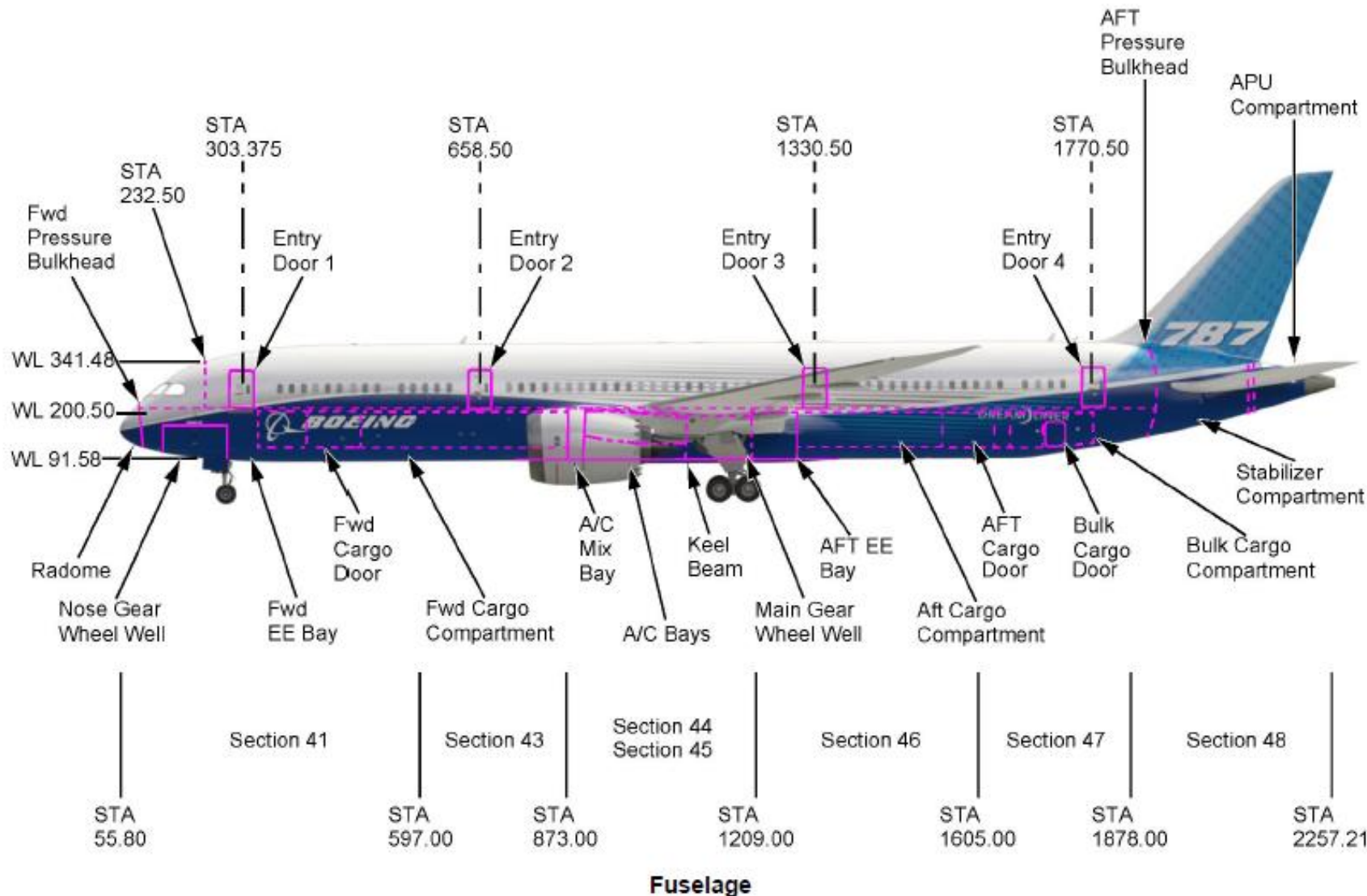
Structures

Fuselage

The fuselage is a pressurized semi-monocoque structure.

The fuselage is made from Carbon Fiber Reinforced Plastic (CFRP) skins with bonded CFRP stringers.

The frames, bulkheads, and floor beams are also CFRP.



Wing

The wing holds fuel, contains fuel system components, and includes the attachment points for the engine strut, landing gear, and flight control surfaces.

The wing primary structure is Carbon Fiber Reinforced Plastic (CFRP) and includes:

- > Front and rear spars
- > Skin panels
- > Stringers.

The ribs are aluminum.

The side-of-body rib connects the outboard wing section to the wing center section.

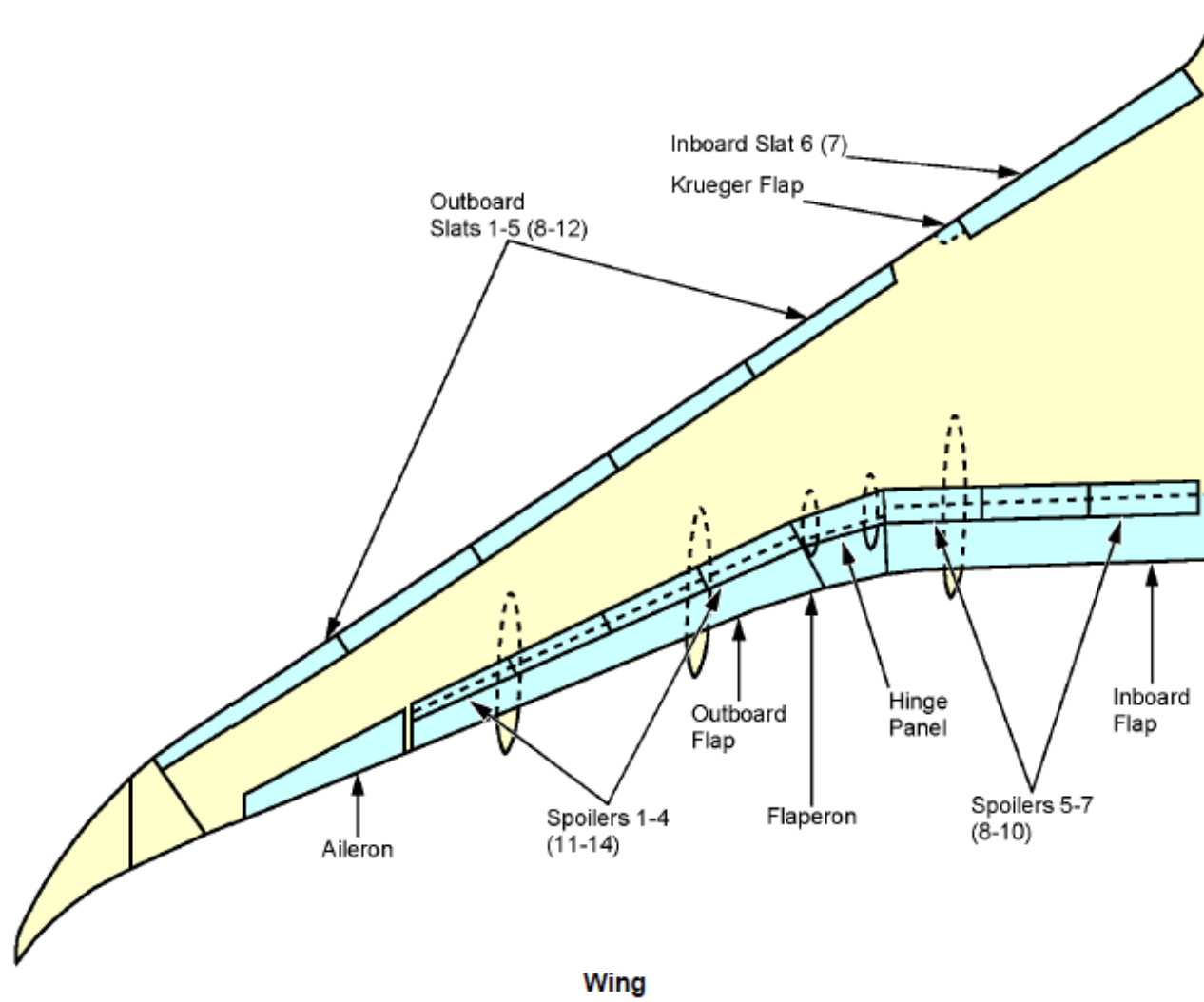
The wing secondary structure includes the leading edge, trailing edge, and aerodynamic fairings.

The leading edge slats attach to the front spar.

These items attach to the rear spar and auxiliary structure:

- > Trailing edge flaps
- > Aileron
- > Flaperon
- > Spoilers.

The wingtip is an aerodynamic fairing on the end of the wing.





Wind-On Ground



Wing-Max Load

Electronic Equipment Bays

There are two main Electronic Equipment (EE) bays on the 787.

The forward EE bay is just aft and on the sides of the nose wheel well.

The aft EE bay is aft of the main wheel well.

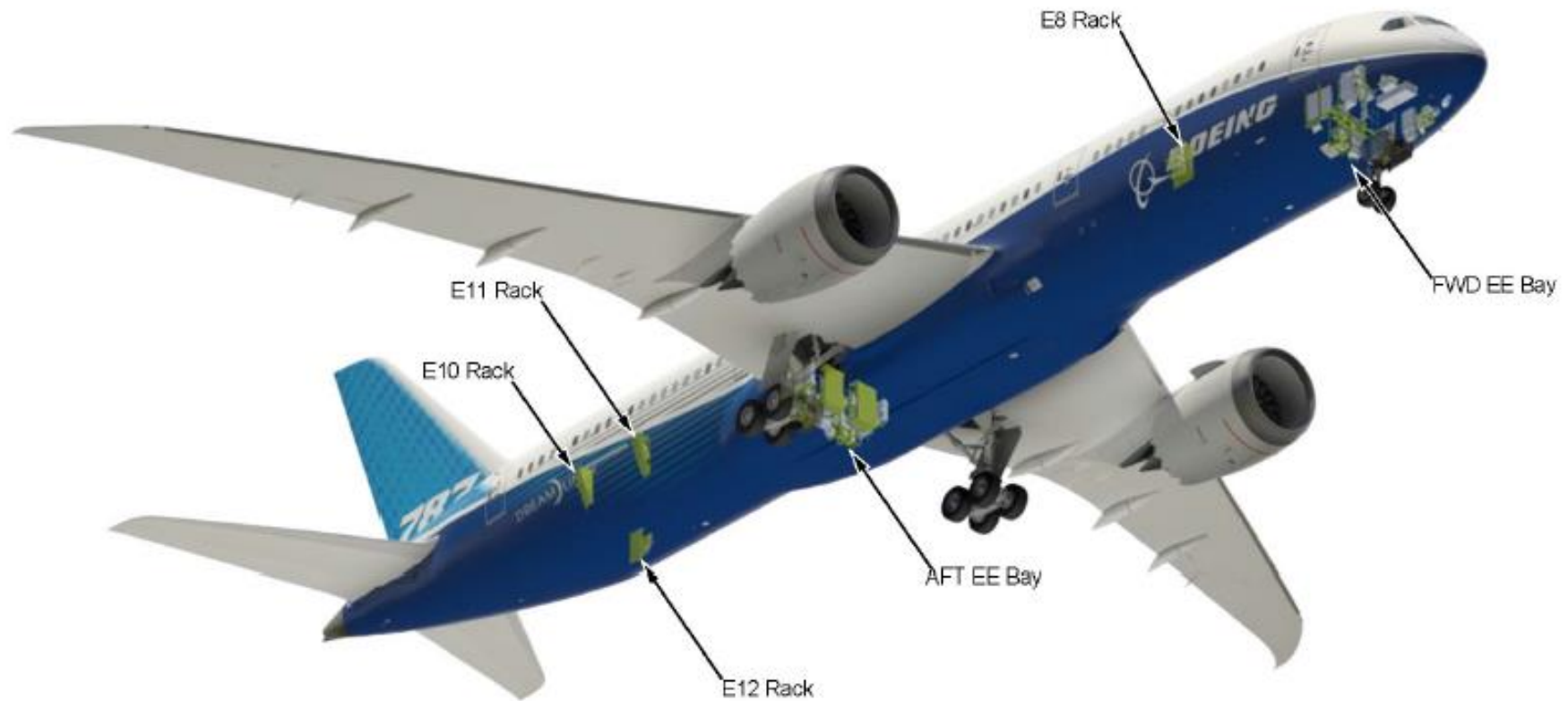
There are also miscellaneous equipment racks in the lower cargo compartments.

The E8 rack is on the aft side of the forward cargo door opening.

The E10 rack is on the aft side of the cargo door opening.

The E11 rack is on the forward side of the aft cargo door opening.

The E12 rack is on the forward side of the bulk cargo door opening.



Electronic Equipment Bays

Flight Deck

Overview

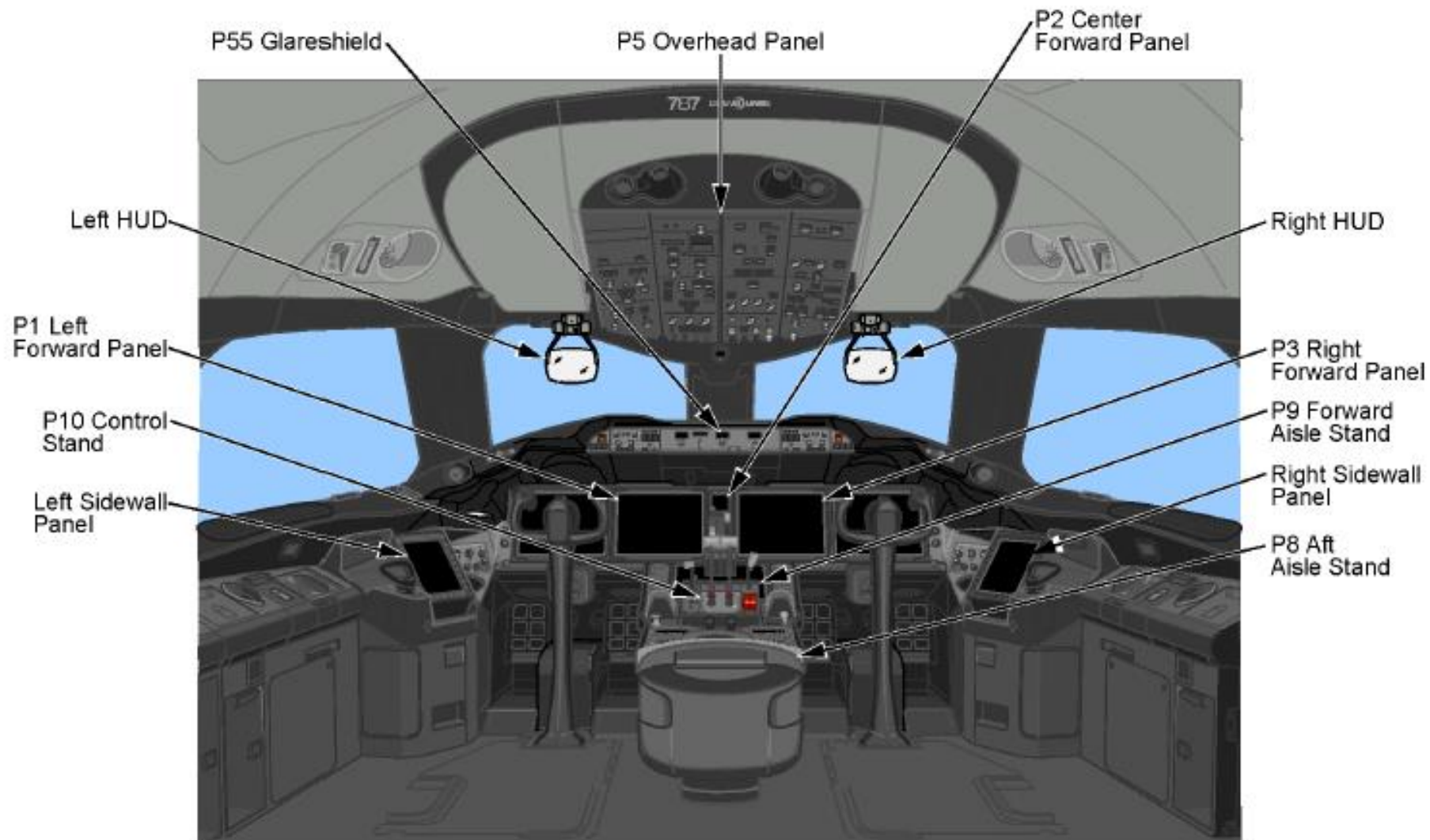
The 787 has a two-pilot flight deck with two additional seats for observers. The 787 flight deck builds on the successful technologies used on the Next-Generation 737 and the 777. The new design provides:

- > Safety enhancements
- > Increased operational capability
- > More standardization
- > Reduced costs.

Larger flat-panel Liquid Crystal Displays (LCD) replace the smaller LCDs used on other Boeing airplanes.

These are some of the new features in the 787 flight deck:

- > Dual head-up displays
- > Vertical situation displays
- > Large-format map displays with 1,280 nm range
- > Fewer Line Replaceable Units (LRU)
- > Fully adjustable first observer seat.



Flight Deck Layout

The flight deck has two crew seats and two observer seats.

The two crew seats have identical functions and features.

The first observer seat has many of the adjustment features of the crew seats.

The second observer seat is not adjustable.

Flight Deck Emergency Egress

There is an overhead door in the flight deck that may be used by the crew for emergency egress if all other means of escape are not available.

The door cover is removed first and then the vent door must be opened.

The overhead door can now be fully opened inward.

The crew can then open the descent device stowage compartment. The descent devices are inertial reel-type devices and are used to lower the crew member to the ground. There is a fold-out step on the rear bulkhead to give access to the overhead door.

If hazards exist on the right side of the airplane, there is an exterior step to enable the crew to descend the left side.

