

UKDirect

Boeing 777-200ER



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Working Together

The Boeing 777 is a long-range wide-body twin-engine jet airliner manufactured by Boeing Commercial Airplanes. It is the world's largest twinjet and commonly referred to as the "Triple Seven", it incorporates more advanced technologies than any other previous Boeing airliner.

Back in the early 1980's at a time when the first DC-10's and TriStars were approaching retirement age Boeing were looking to develop a replacement and turned to their 767, intending to use a stretched 767 code-named 767-X. However airlines were unimpressed with the proposals, preferring instead the new Airbus A330 and A340 and McDonnell Douglas MD-11.

Departing from industry practice Boeing invited the airlines to submit what *they* wanted in a new airliner. The eight major airlines that contributed to the design process became known within Boeing as the "Working Together" group. After consultation Boeing instead adopted an all new design with comparatively large scale use of composites (10% by weight) including the cabin floor and rudder. By March 1990, Boeing and the airlines had decided upon a basic design configuration: a cabin cross-section close to the 747's, capacity up to 325 passengers, flexible interiors, a glass cockpit, fly-by-wire controls, and 10 percent better seat-mile costs than the A330 and MD-11. To accommodate final assembly for the 777 Boeing doubled the size of its Everett factory in Washington, home of 747 production.

The 777 was Boeing's first application of fly-by-wire, featuring an advanced technology glass flightdeck with five Honeywell LCD's, but retaining control yokes rather than sidesticks. The aircraft has triple redundant hydraulic systems with only one system required for landing. A ram air turbine –a small retractable propeller which can provide emergency power– is also fitted in the wing root fairing.

Visually distinguishing features include the largest-diameter turbofan engines of any aircraft, the largest landing gear and the biggest tires ever used in a commercial jetliner. The six-wheel bogies are designed to spread the load of the aircraft over a wide area without requiring an additional centerline gear. This helps reduce weight and simplifies the aircraft's braking and hydraulic systems. Each tire of a 777-300ER six-wheel main landing gear can carry a load of 59,490 lb (26,980 kg), heavier than other wide-bodies such as the 747-400.

The 777 was also offered with optional folding wings where the outer 6m/21ft of each would fold upwards for operations at space restricted airports and it is also the first entirely computer-designed commercial aircraft.



Boeing 777 Family

Boeing uses two characteristics, fuselage length and range, to define their 777 models. Fuselage length affects the number of passengers and amount of cargo that can be carried; the 777-200 and derivatives are the base size, and the aircraft was stretched into the 777-300 in 1998. In terms of range, the aircraft has been categorized into three segments based on design criteria; these were initially defined as the following:

- i. A-market: up to 4,200 nautical miles (7,800 km)
- ii. B-market: 6,600 nautical miles (12,200 km)
- iii. C-market: 7,800 nautical miles (14,400 km)

Boeing's widebody 777 twin has been progressively developed into increasingly longer range developments and consists of five passenger models and a freighter model: the 777-200, 777-200ER (Extended Range), a larger 777-300, two new longer-range models, the 777-300ER and 777-200LR Worldliner (the world's longest range commercial airplane) and the Boeing 777 Freighter.

- i. The 777-200 carries 305 passengers with a range up to 5,240 nautical miles (9,700 km).
- ii. The 777-300 carries 368 passengers with a range up to 6,005 nautical miles (11,120 km).
- iii. The 777-200ER carries 301 passengers with a range up to 7,725 nautical miles (14,305 km).
- iv. The 777-300ER carries 386 passengers with a range of 7,825 nautical miles (14,490 km).
- v. The 777-200LR carries 301 passengers up to 9,395 nautical miles (17,395 km).

The basic 777-200 as launched in October 1990 was offered in two versions, the basic 777-200 (initially A-Market) and the increased weight longer range 777-200IGW (Increased Gross Weight, initially B-Market). The IGW has since been redesignated 777-200ER.

The 777-200 first flew on June 12 1994, with FAA and JAA certification awarded on April 19 1995. The FAA awarded full 180 minutes ETOPS clearance for PW4074 -200s on May 30 that year. First customer delivery was to United Airlines in May 1995. The first 777-200IGW/ER was delivered to British Airways in February 1997.

Three engine manufacturers developed more efficient and quieter turbofans to power the 777. General Electric offers its GE90 series, Rolls Royce offers the Trent 800 series of engines and Pratt & Whitney offers the PW4000 series. For the longer range 777 models and the Freighter, GE is the exclusive engine supplier with its GE90-115B and GE90-110B. Each engine boasts new, larger-diameter fans with wide-chord fan blade designs and bypass ratios ranging from six-to-one to as high as nine-to-one. This compares to the typical five-to-one ratio for the engines of previous twin-aisle jets and results in more efficient and quieter turbofans.



Signature Interior

The 777 interior, also known as the Boeing Signature Interior, features curved panels, larger overhead bins, and indirect lighting. Seating options range from six abreast in first class up to 10 across in economy

In addition the Boeing Signature Interior offers operators configuration flexibility. Flexibility

zones have been designed into the cabin areas specified by the airlines, primarily at the airplane's doors. In one-inch increments, galleys and lavatories can be positioned anywhere within these zones, which are pre-engineered to accommodate wiring, plumbing and attachment fixtures. Passenger service units and overhead stowage compartments are designed for quick removal without disturbing ceiling panels, air conditioning ducts or support structure. A typical 777 configuration change is expected to take as little as 72 hours, while such a change might take two to three weeks on other airplanes.

Boeing 777-200ER

The 777-200ER features additional fuel capacity and an increased maximum takeoff weight (MTOW) over the -200. Aimed at international airlines operating transatlantic routes, the -200ER's maximum range is 7,700 nautical miles (14,300 km). In addition to breaking the eastbound great circle "distance without landing" record, the -200ER also holds the record for the longest ETOPS-related emergency flight diversion (177 minutes under one engine), on a United Airlines flight carrying 255 passengers on March 17, 2003, over the Pacific Ocean.

The first -200ER was delivered to British Airways on February 6, 1997. Singapore Airlines, one of the type's largest customers, ordered over half of its -200ERs with reduced engine thrust specifications (de-rated) for use on medium-length routes. The de-rated engines lower MTOW, which reduces the aircraft's landing fees, and can be re-rated to full -200ER standard for long-haul operations. As of July 2013, -200ER deliveries to 33 different customers totaled 422, ranking the -200ER as the most widely produced variant of the twinjet to date. The newer -300ER variant, however, has accumulated an even larger number of orders.



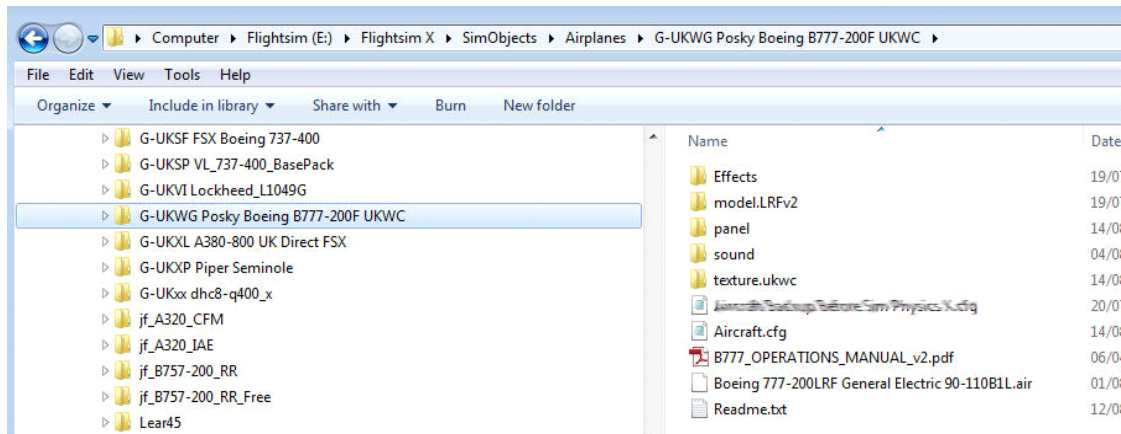


Specifications: *Boeing 777-200ER*

Seating, typical	314 (3-class) 400 (2-class) 440 (maximum)
Cargo capacity	5,720 cu ft (162 m ³) 32× LD3
Length	209 ft 1 in (63.7 m)
Wingspan	199 ft 11 in (60.9 m)
Empty weight	304,500 lb (138,100 kg)
Maximum takeoff weight(MTOW)	656,000 lb (297,550 kg)
Cruise speed	Mach 0.84 (560 mph, 905 km/h, 490 knots) at a cruise altitude of 35,000 ft (11,000 m)
Range, loaded	7,725 nmi (14,310 km, 8,892 mi)
Service ceiling	43,100 ft (13,140 m)
Engines (×2)	Rolls Royce Trent 895
Thrust (×2)	93,400 lbf (415 kN)

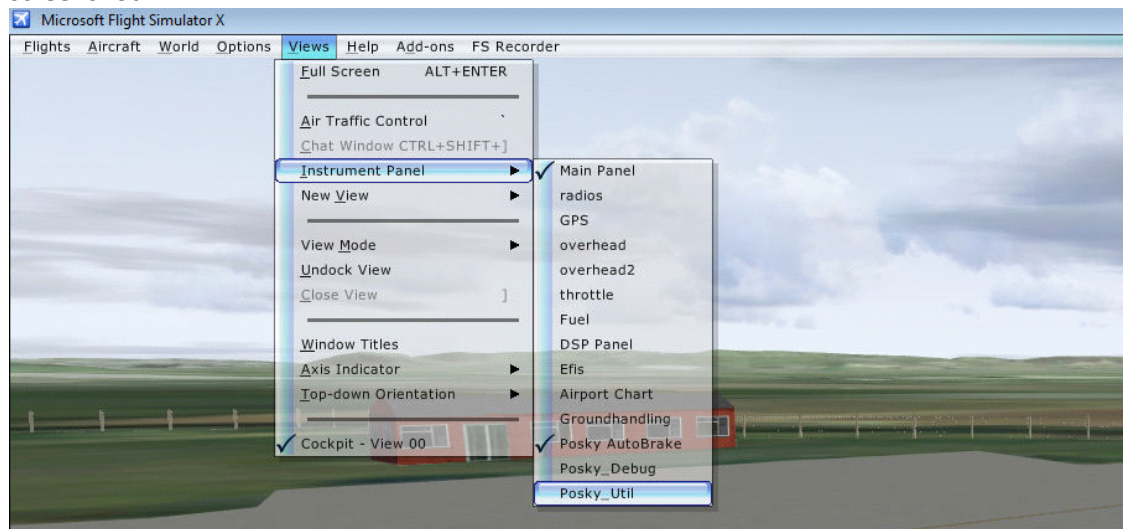
Installation

1. Unzip these files to a temporary directory
2. Cut and paste the G-UKWG Posky Boeing 777F folder into your flightsim directory:
eg. ..\Flightsim X\SimObjects\Airplanes\G-UKWG Posky Boeing 777F



This is how it appears on my pc using Windows 7 with FSX installed on drive E:

3. Cut the contents of the Effects folder and paste into the FSX/FS9 Effects folder.
4. The 777 is aliased to use your default B737 sounds. I would recommend visiting <http://poskyarchive.com/category/boeing/b777-200/> to download their B777 sounds. I would have liked to include them but at 51MB it is impractical.
5. A panel and virtual cockpit is included. This Project Opensky model comes complete with a range of ground vehicles which are controlled by the Posky_Util, selected from the menu as shown in the screenshot.



Operation

Included in the files of this add-on plane is an Operations manual detailing all the required flap settings, speeds, etc so I won't repeat them here. What I will mention is the Posky Utility referred to above. This panel will allow you to open and close doors, use air-stairs and cargo handling facilities, and move standard containers in and out of the hold - all branded with your favourite airlines logo's of course.

The Panel



1. Standard Sim Icons to open other panels.
2. These are actually toggle switches - click to change eg. from Mach to IAS, or Heading to Bearing.
3. Autobrake panels - explained below
4. Another Sim Icon this time for the radios, but easily overlooked.

This panel includes all the things you would expect as standard for a freeware panel but also includes those little touches to raise the bar. ie when selecting height on the autopilot the number doesn't change incrementally but at a consistent rate - however the little switch to select increments by 100's or 1000's works. Many of the buttons are functional on the EFIS (the panel immediately to the left of the 'Autopilot' panel or Mode Control Panel (MCP)) and selecting the 'TER' actually plots the ground beneath the aircraft on the pilots Navigation Display (ND). Top of Climb and Bottom of Descent predictions are also shown on the ND. Whilst following one heading another can be dialed in in anticipation of a heading change and then executed at the required moment by pressing the center of the heading knob "SEL".

The downside (if you use FSX) is this panel was designed for FS2004 so if you experience autobrake problems then this next bit is for you - this probably won't apply to FS9 users!



When I was flight testing the plane in FSX with the supplied panel I had a problem with the autobrake - it worked but after landing it could only be disengaged by applying the parking brake which presents a problem when flying with FS Airlines. Worse still is once the brakes are disengaged they stop working completely.

I found a work around solution to this problem by installing another Project Opensky autobrake (v1.3) which will appear in the top-right corner of your screen (box 1 in screenshot above). You can right-click on it and in the pop-up menu select UNLOCK WINDOW which will allow you to position it in box 2 over the panel autobrake. Right-clicking will lock it again.

Sources

<http://en.wikipedia.org/>

<http://www.airliners.net/>

<http://www.boeing.com/>

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Recommended

Sound File: <http://poskyarchive.com/category/boeing/b777-200/>

Project Opensky produced a superb sound set to accompany this model and is highly recommended but be aware it is 51Mb.

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As always if you have any problems please ask on the forum or send me a message via FSAirlines.

Produced for UK Direct Airways by M.Greenough UKD171

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www.planecrazy.me.uk/ukd