747X Quiet Longer Range Family
Airport Compatibility

April, 2002

Specific airport compatibility questions concerning commercial aircraft should be forwarded to:
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This brochure provides airport compatibility data for the 747X Quiet Longer Range Family. This information is intended solely for airport planning purposes. All information in this brochure is preliminary and may change during development and testing.

The 747-400XQLR is the latest derivative of the 747 family of airplanes and is being developed in both passenger and freighter versions. Based upon the 747-400ER, the 747-400XQLR has a higher gross weight, 921,000 lb (417,759 Kg) MTOW, to increase the range by 300 nmi. The 747-400XQLR Freighter improves upon the 747-400 Freighter with an additional 700 nmi and is more environmentally friendly. To improve performance the 747-400XQLR will incorporate changes to the 747-400 wing, including raked wingtips and trailing edge wedge. These improvements include lower noise, reduced fuel burn, more range, and faster cruise speed (Mach .86). The raked wingtip will increase the 747's wingspan from today's 213 ft (64.9 meters) to 225 ft 3 inches (68.7 meters). The 747-400X Quiet Longer Range will see noise reductions of 20 percent on takeoff and 40 percent on approach, compared to today's 747-400s. The 747-400XQLR is expected enter into service in early 2004.
# General Airplane Characteristics

## 747-400XQLR

### Table of General Airplane Characteristics

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>UNITS</th>
<th>TODAY'S 747-400</th>
<th>747-400XQLR</th>
<th>747-400XQLRF (FREIGHTER)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX DESIGN</td>
<td>POUNDS</td>
<td>877,000</td>
<td>923,000</td>
<td>923,000</td>
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<tr>
<td>TAXI WEIGHT</td>
<td>KILOGRAMS</td>
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<td>418,666</td>
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<td>921,000</td>
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<td>TAKEOFF WEIGHT</td>
<td>KILOGRAMS</td>
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<td>417,759</td>
<td>417,759</td>
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<td>POUNDS</td>
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<td>LANDING WEIGHT</td>
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<td>302,093</td>
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<td>POUNDS</td>
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<td>613,000</td>
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<td>FUEL WEIGHT</td>
<td>KILOGRAMS</td>
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<td>251,744</td>
<td>278,052</td>
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<td>SPEC OPERATING EMPTY</td>
<td>POUNDS</td>
<td>398,800 (1)</td>
<td>411,000 (2)</td>
<td>364,300</td>
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<tr>
<td>WEIGHT</td>
<td>KILOGRAMS</td>
<td>180,892</td>
<td>186,427</td>
<td>165,244</td>
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<tr>
<td>MAX STRUCTURAL WEIGHT</td>
<td>POUNDS</td>
<td>156,200</td>
<td>144,000</td>
<td>248,700</td>
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<tr>
<td>PAYLOAD</td>
<td>KILOGRAMS</td>
<td>70,851</td>
<td>65,317</td>
<td>112,808</td>
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<td>SEATING Capacity</td>
<td>TWO-CLASS</td>
<td>524 = 42 FIRST + 482 ECONOMY</td>
<td>524 = 42 FIRST + 482 ECONOMY</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>THREE-CLASS</td>
<td>416 = 23 FC + 78 BC + 315 EC</td>
<td>416 = 23 FC + 78 BC + 315 EC</td>
<td>----</td>
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<tr>
<td>MAX CARGO</td>
<td>CUBIC FEET</td>
<td>6,025 (3)</td>
<td>5,599 / 4,837 (4)(5)</td>
<td>27,467 (6)</td>
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<tr>
<td></td>
<td>CUBIC METERS</td>
<td>149</td>
<td>158.5 / 137.0</td>
<td>778</td>
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<tr>
<td>MAXIMUM FUEL CAPACITY</td>
<td>US GALLONS</td>
<td>57,065 (7)</td>
<td>65,705 (8)</td>
<td>53,765</td>
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<tr>
<td></td>
<td>LITERS</td>
<td>216,014</td>
<td>248,710</td>
<td>203,523</td>
</tr>
</tbody>
</table>

**Notes:**
1. SPEC OPERATING EMPTY WEIGHT FOR BASELINE CONFIGURATION OF 400 PASSENGER ARRANGEMENT AND STANDARD ITEM ALLOWANCES; ROLLS ROYCE ENGINES. CONSULT WITH AIRLINE FOR SPECIFIC WEIGHTS AND CONFIGURATIONS.
2. SPEC WEIGHT FOR BASELINE CONFIGURATION OF 416 PASSENGERS, EXPANDED TAIL TANK AND ONE BODY FUEL TANK / TWO BODY FUEL TANK (GE ENGINES). CONSULT WITH AIRLINE FOR SPECIFIC WEIGHTS AND CONFIGURATIONS.
3. MAX CARGO LOWER DECK CONTAINERS (30) LD1’S; or 5,332 CU FT - (5) PALLETS, (14) LD1’S + 1 PALLETS BULK CARGO
4. FWD CARGO - (4) 96” x 125” PALLETS / 1660 CU FT TOTAL
   AFT CARGO - (14) LD1’S / 2422 CU FT TOTAL
   BULK CARGO - 755 CU FT (449 CU FT WITH 2 OPTIONAL CONTAINERS)
5. FWD CARGO - (4) 96” x 125” PALLETS / 1660 CU FT TOTAL
   AFT CARGO - (14) LD1’S / 2422 CU FT TOTAL
   BULK CARGO - 755 CU FT (449 CU FT WITH 2 OPTIONAL CONTAINERS)
6. MAIN DECK - 21,347 CU FT (30 PALLETS, 96IN. X 125 IN);
   (LOWER DECK - 5,600 CU FT (32 LD-1 CONTAINERS); BULK CARGO - 420 CU FT
   OPTIONAL TAIL FUEL OF 3,300 US GAL
7. 5,500 USG (EXPANDED TAIL FUEL) AND TWO AUXILIARY BODY FUEL TANKS IN FWD LOWER CARGO HOLD; FUEL CAPACITY WITH ONE BODY TANK IS 60,495 US GAL (228,990L)
Interior Arrangement
747-400XQLR

Tri-Class Seating, Long-Range Rules

23 first
61-in pitch

38 business
39-in pitch

315 economy
32-in pitch

40 business

416 passengers

In-flight overhead crew rest
8 bunks and 2 seats

747-400XQLR same size as current 747-400
Payload-Range Capability
747XQLR
General Electric Engines

<table>
<thead>
<tr>
<th>Payload-Range Capability</th>
<th>Range ~ 1000 nmi</th>
</tr>
</thead>
<tbody>
<tr>
<td>416 Passengers</td>
<td></td>
</tr>
<tr>
<td>747-400 / CF6-80C2B1F</td>
<td>875,000 lb MTOW</td>
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<tr>
<td>555,000 lb MZFW</td>
<td>398,800 lb OEW</td>
</tr>
<tr>
<td>7,260 nmi Design Range</td>
<td></td>
</tr>
<tr>
<td>747-400 ER / CF6-80C2B5F</td>
<td>910,000 lb MTOW</td>
</tr>
<tr>
<td>555,000 lb MZFW</td>
<td>405,300 lb OEW</td>
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<tr>
<td>7,500 nmi Design Range</td>
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</tr>
<tr>
<td>747-400 XQLR / CF6-80C2B10F</td>
<td>910,000 lb MTOW</td>
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<tr>
<td>555,000 lb MZFW</td>
<td>409,400 lb OEW</td>
</tr>
<tr>
<td>7,875 nmi Design Range</td>
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<tr>
<td>747-400 XQLR / CF6-80C2B10F</td>
<td>921,000 lb MTOW</td>
</tr>
<tr>
<td>555,000 lb MZFW</td>
<td>411,000 lb OEW</td>
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<tr>
<td>8,000 nmi Design Range</td>
<td></td>
</tr>
<tr>
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<td>910,000 lb MTOW</td>
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<tr>
<td>7,715 nmi Design Range</td>
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<tr>
<td>555,000 lb MZFW</td>
<td>411,000 lb OEW</td>
</tr>
<tr>
<td>8,000 nmi Design Range</td>
<td></td>
</tr>
</tbody>
</table>
Payload-Range Capability
747XQLR
Pratt & Whitney Engines

- Typical Mission Rules
- Standard Day
- Nominal Fuel Burn
- Mach 0.855
- 210 lb / Passenger
- 6.7 lb / US Gallon
**Payload-Range Capability**

*747XQLR Freighter*

- **GE engines**
- **Typical mission rules**
- **Nominal fuel burn**
- **85% annual winds**
- **6.7 lb per U.S. gal fuel density**

**Payload, 1,000 lb (1,000 kg)**

**Range, 1,000 nmi (1,000 km)**

- **Cargo density**:
  - 9 lb per ft³ (144.2 kg per m³)
  - 8 lb per ft³ (128.1 kg per m³)
  - 7 lb per ft³ (112.1 kg per m³)

- **Fuel capacity, U.S. gal (L)**
  - 747-400F 875K MTOW 610K MZFW: 53,765 (203,504)
  - 747-400ERF 910K MTOW 611K MZFW
  - 747-400XQLRF 910K MTOW 611K MZFW
### Field Length Range

**747-400XQLR**

- **747-400XQLR / PW4062**
  - MTOW 921,000 lb
  - OEW 410,800 lb
  - 416 Passengers
  - 66,055 USG Fuel Capacity / 2 Body Tanks

- **747-400XQLR / PW4062**
  - MTOW 910,000 lb
  - OEW 409,200 lb
  - 416 Passengers
  - 62,795 USG Fuel Capacity / 1 Body Tank

- Flaps 20 Takeoff
- Zero Wind & Slope
- ISA + 15°C Takeoff Temp
- Typical Mission Rules
- Standard Day Cruise Temp
- Nominal Fuel Burn
- 210 lb/PAX
- 6.7 lb/USG Fuel Density
Field Length Range
747-400XQLR

747-400XQLR / CF6-80C2B10F
MTOW 921,000 lb
OEW 411,000 lb
416 Passengers
65,788 USG Fuel Capacity / 2 Body Tanks

747-400XQLR / CF6-80C2B10F
MTOW 910,000 lb
OEW 409,400 lb
416 Passengers
62,575 USG Fuel Capacity / 1 Body Tank

- Flaps 20 Takeoff
- Zero Wind & Slope
- ISA + 15°C Takeoff Temp
- Typical Mission Rules
- Standard Day Cruise Temp
- Nominal Fuel Burn
- 210 lb/PAX
- 6.7 lb/USG Fuel Density

PRELIMINARY

PRELIMINARY
**Fillet Requirements**

*747-400XQLR*  

**Notes:**  
- Symmetrical thrust  
- Mid CG  
- Body gear steering inoperative  
- No differential braking  
- Before determining the size of intersection fillets, consult using airlines or airport authority regarding operating procedures and aircraft types expected to serve the airport.

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* Approximate path of outside edge of wing gear tires  
* Modified fillet  
* Runway-to-taxiway centerline of turn  
* Nose gear tracking centerline to centerline  

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* Fillet requirements are the same as the 747-400 family (except SP)
Notes:
- Symmetrical thrust
- Mid CG
- Body gear steering inoperative
- No differential braking
- Before determining the size of intersection fillets, consult using airlines or airport authority regarding operating procedures and aircraft types expected to serve the airport

Approximate path of outside edge of wing gear tires

Approximate 16 ft (5m) (both sides)

R = 100 ft (30m)

Runway-to-taxiway centerline of turn

Approximate path of nose gear

150 ft (45m)

Nose gear tracking beyond intersecting taxiway centerline (judgemental oversteering)

7 ft (2m)

R = 100 ft (30m)

Approximate path of outside edge of wing gear tires

Modified fillet

Approximate path of nose gear

150 ft (45m)

Nose gear tracking centerline to centerline

* Fillet Requirements are the same as 747-400 family (except SP)
Nose/Body Gear Turn Ratios

747-400XQLR*

Nose gear

Max 70˚

Body gear

Max 13˚

Wing gear

Turn center

* Turn ratios are the same as 747-400 family (except SP)
# Turning Radius Requirements

**747-400XQLR**

<table>
<thead>
<tr>
<th>X TURN RADIUS (FEET)</th>
<th>A (4) WING TIP</th>
<th>B (3) NOSE GEAR</th>
<th>C (3) WING GEAR</th>
<th>D TAIL TIP</th>
<th>E NOSE</th>
<th>Z (3) MINIMUM WIDTH FOR 180° TURN</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>(1) 163 165</td>
<td>(1) 96 91</td>
<td>(1) 61 61</td>
<td>(1) 142 146</td>
<td>(1) 117 112</td>
<td>(1) 156 152</td>
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<tr>
<td>60</td>
<td>(1) 182 184</td>
<td>(1) 106 102</td>
<td>(1) 81 81</td>
<td>(1) 154 158</td>
<td>(1) 125 120</td>
<td>(1) 187 183</td>
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<tr>
<td>80</td>
<td>(1) 201 202</td>
<td>(1) 119 115</td>
<td>(1) 101 101</td>
<td>(1) 167 171</td>
<td>(1) 136 132</td>
<td>(1) 219 216</td>
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<tr>
<td>100</td>
<td>(1) 220 222</td>
<td>(1) 133 130</td>
<td>(1) 121 121</td>
<td>(1) 182 185</td>
<td>(1) 148 145</td>
<td>(1) 254 251</td>
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<tr>
<td>120</td>
<td>(1) 240 241</td>
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<td>(1) 141 141</td>
<td>(1) 197 200</td>
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<td>(1) 290 287</td>
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<td>140</td>
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<td>(1) 161 161</td>
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<td>(1) 181 181</td>
<td>(1) 230 233</td>
<td>(1) 194 191</td>
<td>(1) 364 362</td>
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</tbody>
</table>

(1) BODY GEAR STEERING INOPERATIVE  
(2) WITH BODY GEAR STEERING  
(3) MEASURED TO OUTSIDE TIRE FACES  
(4) WINGSPAN AT 225 FT 3 IN
**Landing Gear Footprint**

*Foot print the same as 747-400 family (except SP)*
Aircraft Classification Number
747-400XQLR
Rigid and Flexible Pavement

Aircraft Gross Weight (x 1,000 lb)

Aircraft Classification Number (ACN)

Flexible

Rigid

CODE D - K=75 (ULTRA LOW)
CODE C - K=150 (LOW)
CODE B - K=300 (MEDIUM)
CODE A - K=550 (HIGH)

CODE D - CBR 3 (ULTRA LOW)
CODE C - CBR 6 (LOW)
CODE B - CBR 10 (MEDIUM)
CODE A - CBR 15 (HIGH)
The 747-400XQLR Is a Quiet Neighbor

747-400XQLR Noise Area Reduced by 40% Over 747-400

- 85-dBA contour comparison; takeoff with cutback; ICAO B