



## F.A.Q

### DOMUS BBJ

#### INTERIOR DESIGN COMPETITION

##### **1) What is the size of the executive jet market ?**

Industry analysts project a requirement for 600 new long-range executive jets during the next decade. The BBJ has already 46 firm orders.

*Answer provided by our experts from Boeing Business Jets (BBJ).*

##### **2) Who is currently making the interior of the BBJ ?**

Boeing Business Jets does not make the interior for their jet. The buyer has to choose who will take care of the interior. There are currently 7 completion centers that you can choose from for the BBJ. These include: Raytheon, Lufthansa Technik, Associated Air Center, Greenpoint Technologies, Jet Aviation, The Jet Center, and Ozark Aircraft Systems

*Answer provided by our experts from Raytheon.*

##### **3) Where can I get the most relevant FAA Regulations ?**

For interiors requirements, take a look at the FARs, particularly FAR 25.771 through 25.819. There may be more, but these are relevant to passenger aircraft.

FARs are on the web at <http://www.faa.gov/avr/afs/fars/far-25.txt>.

*Answer provided by our experts from the Boeing Commercial.*

##### **4) Could you please clarify parts a. through c. of Anonymity For The Second Phase Of The Competition. Something about a 6-digit code number. Is this relevant to the contestants ?**

Parts a) – c) of the anonymity for the 2nd phase of the competition applies to all contestants. We do not want the final jury to be biased in any way during their deliberation. Therefore we ask all contestants to **not** write their name or any other distinguishing mark on their final project. Instead a six digit code should be used. An envelope should be sent separately by mail to Domus BBJ, with the six-digit code, and the name of the corresponding team. These letters will be open, in front of a notary, only **after** the final jury has deliberated. The letter should also include the items listed under c), as well as a declaration of the acceptance of the [rules of the competition](#).

*Answer provided by our experts from PCL.*

##### **5) Is it possible to get a cross-section with all the important information ?**

The maximum fuselage constant cross-section is 148" width. This consists of two 74" radii from a point 24.4" above the top of the fuselage floor beam. The maximum usable interior width is somewhat less, as the distance from the inside of the cabin sidewall to the exterior skin is 3.75" per side. Subtracting 7.5" (3.75 x 2) from 148" yields a usable constant interior cross-section of 141". Note that this is the maximum cross-section; it is considerably less if measured from different points in the cabin. To visualize the cross section, click [here](#).

*Answer provided by our experts from United Airlines.*

**6) Which elements of the plane can be replaced or changed ?(Windows and so on ?)**

ANYTHING on an airplane can be changed or modified as long as there is enough money and engineering expertise to design, test, and certify it. More realistically, the customers will probably not change the engines, the power generators, the APU, the primary structure, the avionics boxes, etc. too much. The things that typically get changed are in the interior (including replacement of windows with plugs), in the communications systems (wiring, antennae, etc.), plus standard conversions for major systems like for the winglets and fuel tanks. It might be better if you have questions about specific parts of the airplane!

*Answer provided by our experts from Boeing Commercial.*

**7) Could we have the exact location of the center of gravity of the aircraft ?**

The CG of an empty BBJ is at about Body Station 650. For flight, the CG limits are ahead and aft of this station, and they vary depending on the airplane's flight regime, but this is a pretty good number to work with.

*Answer provided by our experts from Boeing Commercial.*

**8) On the MRB Locator fuselage diagram, each station is 20 inch apart, is that right ?**

All of the stations are the distance apart in inches marked as the STA (that part is pretty obvious). This distance is usually 20 inches. Note that the front of the airplane is NOT at STA 0. Also, where there are stations marked with letters, like "STA 500C" and "STA 500D", the separation is 20 inches.

*Answer provided by our experts from Boeing Commercial.*

**9) Can I still apply for the competition ?**

We are not accepting any new applications as the official deadline for the first phase (application phase) was August 31st, 1999. We are currently running the second phase, in which the teams who were qualified in the first phase have until March 31st, 2000 to bring their project to completion.

*Answer provided by our experts from PCL.*

**10) Is the BBJ usually privately owned by a company, or are they rented/chartered?**

BBJ are bought either by very large companies for their CEO (i.e. ATT), by countries for their presidents and other officials, or by wealthy people. However, the idea of renting has developed recently, and there is a fractional ownership program called [NetJets](#), from Executive Jet, that allows you to buy 1/8 of a BBJ.

*Answer provided by our experts from PCL.*

**11) In the current BBJ, who determines the floor plan. Is it flexible or modular?**

The floor plan is entirely modular. BBJ delivers the airplane green (which means without any interior), and the completion centers put the interior inside. What goes in, how it is arranged etc, is entirely up to the customer.

*Answer provided by our experts from PCL.*

**12) Can we receive any printed promotional material, technical manuals, plan drawings (measurements), or photographs ?**

Please check our [technical data webpage](#), as well as the [official BBJ website](#). We have also emailed every contestant with a .pdf file containing more accurate data.

*Answer provided by our experts from PCL.*

**13) What is the maximum and minimum number of the service crew ? And what is the max/min and average number of passengers ?**

The BBJ sleeps 9 in our configuration and seats 19. This can vary according to company but these figures are pretty common. We have no research data, but I,m guessing the average will be about 8.

*Answer provided by our experts from Executive Jet.*

#### **14) How is the food service provided ? private catering or set meals ?**

We do a combination of catering and cooking. This varies by trip length and number of passengers. Only the Middle Eastern with first class seats in the rear and some sports teams do "set tray" service. Most set the tables and serve in the manner for 5 star restaurants. For short trips with lots of folks we often do a buffet in the main room and people serve themselves and the F/A sets the placemats and gets drinks and clears away. Our A/C has two high temperature convection ovens. Some people have steam ovens, Jen-Aire cook tops refrigerators, dishwashers (there is one for an aircraft) and trash compactors. Big sinks for dishwashing are a necessity as are storage spaces for ice chest for keeping frozen food for later. Hope this helps.

*Answer provided by our experts from Executive Jet.*

#### **15) What is the perceived target market ? What are their activities on board ? And on the Earth? What magazines do they read ?**

The target of Executive Jet will be the owners that are Gulfstream customers, Corporations and VERY successful individuals that go to Pacific Rim, Australia, etc a lot. I believe Boeing will go after the same folks, (ones that want an entire airplane). Again as to activities, the usual way a trip goes on the Gulfstream , and from my old private 727 days: After cruise they talk and or read all the stuff their secretaries have given them and or go on the computer (we do not have E-Mail on the Gulfstream) and munch and have a drink. Then in about one hour they all want something to eat. This process can take about 2 hours on an A/C. Then they usually have coffee and want to watch a movie. At this time they begin to drift off, so pillows, blankets start coming out and on the Boeing they would begin drifting toward the bedrooms so the F/A's would be making beds. Sleep usually lasts no more than 4 hours unless they took some sleeping medication. Then they start the let's drink and eat a snack process over again. Business gets done in between or in earnest about an hour before landing. I still would see this process being a cycle even on the BBJ (I have seen it).

*Answer provided by our experts from Executive Jet.*

#### **16) What is the size of the doors ?**

The airplane has these doors:

- One forward entry door (left) 34 inches wide by 72 inches high
- One aft entry door (left), 30x72"
- Two service doors (one right forward and one right aft), 30x65"
- Two over-wing emergency s (escape hatch), 20x39"

*Answer provided by our experts from United Airlines.*

#### **17) What is the size of the windows ?**

Passenger compartment and escape hatch windows are approximately 10 inches wide by 14 inches high.

Each entry door and each service door has an observation window approximately 5 inches in diameter.

*Answer provided by our experts from United Airlines.*

**18) What are the floor loading limits ?**

The passenger compartment floor and structure can support a uniformly distributed longitudinal load of 37.5 pound per inch. Floor panels can support 100 pounds per square foot.

*Answer provided by our experts from United Airlines.*

**19) Were are the watertanks and what size they have (liter) ? Are they fixed ?**

The BBJ gets a 60-gallon (227-liter) water tank. It's located in the back of the airplane on the left side under the floor aft of the cargo door. The system and its components are fixed, but any operator or conversion shop can modify the water system if they can get their design tested and certified.

*Answer provided by our experts from Boeing Commercial.*

**20) What methods are used to attach furniture to the plane ?**

There are two seat-tracks on each side on the BBJ when it is delivered to the completion centers. This totals 4 seat tracks, located at Right Buttock Line 24 and 45 and Left Buttock Line 24 and 45. The numbers are in inches, so the tracks are about 21 inches apart. They run almost the whole way from the forward doors to the aft doors, curving in just a little bit at the forward end of the fuselage to maintain 21 inch seat track separation as the fuselage tapers. They are bolted to the top of the floor beams, at about Water Line 208. For Buttock Line (BL) and Water Line (WL) locations, please refer to the documents provided, especially the fuselage cross-sections.

There is possibility of adding more tracks as you wish to mount other interior. There is also the possibility of using palettes. These are attached to the seat-tracks, and then other elements can be mounted anywhere on the palette.

*Answer provided by our experts from Boeing Commercial and BBJ.*

**21) Can you tell us more about these famous FARs and FAA regulations ? I assume they are the same for all airplanes, and that include the BBJ, right ?**

You are right, the safety regulations have to be kept also for the BBJs. But there are means of compliance; two examples:

- unobstructed emergency exits: it is possible to install a seat in the exit area. However, for taxi, take-off and landing the seat has to be relocated for example with a floor tracking system (seat slides in the seat tracks), for use during flight it can be moved back to the desired position
- heat release requirements: if compliance cannot be assured a "cargo compartment type" smoke detection system has to be installed in the compartment of non-compliance.

*Answer provided by our experts from Lufthansa Technik*

**22) Is it possible to have movable walls/furniture ? or is it unsafe and restricted by the FAA? for example rotating chairs ?**

The FAR's are not very specific. The best example I can think of is the pilots' seats. These are moveable along their tracks (over about 2 feet of length), but must be locked immediately after a new position has been chosen. So I'd say, moveable interiors are ok, but they must meet all applicable FAR's in each possible position and there must be clear signs instructing the passengers to keep the moveable parts locked. Oh, and about rotating chairs...I'd be surprised if the FAA would certify a fully rotating chair. I've seen them in airplanes, but I'd guess that their rotation is limited or that they can only be clocked to specific angles, like the recline on a typical American car seat. See FAR 25.787-789 for additional reference.

*Answer provided by our experts from Boeing Commercial.*

**23) Must the passengers sit facing the direction of movement during takeoff and landing ?**

No, the FAR's do not require this. Actually, it's safer to sit facing backwards. They do have strict requirements for berths (like a sleeping compartment), but nothing special for seats. Keep these factors in mind: (a) under crash loads (negative acceleration), the passengers' heads must not come near ANY objects as they bend forward, (b) under all extreme loads, headrests, seats, and seatbelts must be designed to support the torso, arms and head...meeting these FAR's probably requires fewer features on the seat (i.e., less weight) for forward-facing seats, plus passengers generally prefer to face forward.

*Answer provided by our experts from Boeing Commercial.*

**24) What are the current materials used for the walls and furniture ?**

Interior cabin sidewalls on Boeing aircraft are generally made of nonreinforced tedlar laminate or decorative tedlar laminate. These materials, as well as all interior items used on Boeing aircraft, must meet the flammability requirements specified by Boeing and the FAA. However, some exception can be made for the BBJ, as mentioned in [FAQ#21](#). As for the furniture that a BBJ operator may choose to install, it would similarly need to meet the applicable [FARs](#) or [exemptions](#), and the completion centers might be able to shed more light on typical materials used.

*Answer provided by our experts from United Airlines.*

The information you are asking for can be found in the World Aviation Directory (WAD). Most public libraries have the book in their technical section. If not, here is the contact info:  
World Aviation Directory

Div. McGraw-Hill

Suite 900

1200 G St N.W.

Washington, DC 20005

Fax: 1-202-383-2440

Email: [wad@mcgraw-hill.com](mailto:wad@mcgraw-hill.com)

Web: [www.wadaviation.com](http://www.wadaviation.com)

*Answer provided by our experts from Raytheon.*

**25) What are the technical standards of the sanitary systems ? What are the producers ?**

The BBJ delivers from Boeing with a vacuum lavatory installed at the forward left position, just aft of the cockpit and forward of door 1L. A blower provides system vacuum pressure below 16,000 ft., and the pressure differential between inside and outside cabin pressure provides the system vacuum above 16,000 ft. Information on the status of the lavatory system is provided at the attendant panel on the front face of the lav module. The vacuum toilet system is serviced at a single service panel in the aft lower fuselage. A four-inch diameter drain fitting is used to empty the standard 60-gallon waste tank. Of course, the completion centers are adding additional lavatory facilities elsewhere in the aircraft, and I assume that these are integrated into the system in such a manner as to facilitate the same single-point service access. For specific information on the features of these other lavatories (which may be quite different than typical airline lav modules), I'd refer to the completion centers.

*Answer provided by our experts from United Airlines.*

The information you are asking for can be found in the World Aviation Directory (WAD). Most public libraries have the book in their technical section. If not, here is the contact info:  
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Fax: 1-202-383-2440  
Email: [wad@mcgraw-hill.com](mailto:wad@mcgraw-hill.com)  
Web: [www.wadaviation.com](http://www.wadaviation.com)  
*Answer provided by our experts from Raytheon*

**26) Is it possible to change the size of windows ?**

No. But you can replace it with a plug (i.e. "cover the window", see [FAQ#6](#))  
*Answer provided by our experts from PCL.*

**27) Does the competition require a cost analysis of the interior ?**

Cost analysis is not required. Current interiors costs several millions of US\$ - and any interior will probably cost about the same. Could be twice as much, but as long as the concept is new, innovative and attractive, BBJ customers will be willing to pay for it. If you really want information on prices of existing aircraft interior, refer to the [WAD](#).  
*Answer provided by our experts from PCL.*

**28) Does the competition require an engineering analysis ?**

Complete engineering analysis is impossible without the collaboration of Boeing - and the existence of proprietary agreement between the design architect studio (or completion center) and Boeing. Therefore, we do not expect a full-blown engineering analysis. We expect however to get something that seems possible to realize on a aircraft.  
*Answer provided by our experts from PCL.*

**29) Does the competition require a safety analysis ?**

Safety analysis cannot be complete without an FAA approval. Regulations (FARs) are "looser" on the BBJ. For example fire-retardant property regulations can be by-passed by installing smoke detectors. See [FAQ#21](#). For the competition, we recommend common sense. There is always a way to implement a design - some modifications will have to be made, but that's your innovative ideas that interest us, not FAA-compliance !  
*Answer provided by our experts from PCL.*

**30) Is a graphic and animated presentation sufficient ?**

It is for you to know ! For the final project, we accept drawings, slides, animations, and models (see [Guidelines](#)). It can be only animation, or it can be all four ! Think what would best express your ideas ! Ask yourself, if you were one of the judges, what would you prefer to have ! This point is for you to decide - we keep the possibilities open !  
*Answer provided by our experts from PCL.*

**31) The seat tracks, are they removed or covered when they are not used ? if covered, how do you cover them ?**

Seat tracks are not typically removed . They sit at about the level of the top of the floor panels and, when not used, are protected by plastic covers that snap into place. This is to protect the seat tracks from damage from passenger bags/shoes/drinks/etc. and also so for appearance reasons.  
*Answer provided by our experts from Boeing Commercial.*

**32) Wich height must the aisle have and has it to be in the middle of the room?**

The aisle height of 73 inches is required for our standard delivery airplanes, based on the 95th percentile male. Height obstacles include liferafts in the ceiling, video monitors, exit signs, etc. Offset aisles are acceptable as long as emergency egress is not impeded. The FAR's are not specific about aisle height.  
*Answer provided by our experts from Boeing Commercial.*

**33) How much place is there in the cargo hold and how much of the place needs the tanks?**

The total cargo volume of a BBJ is almost 1000 cubic feet. Depending on the configuration of fuel tanks chosen, this could be reduced to as little as 100 cubic feet in a delivered BBJ. In a typical configuration, with 2500 gallons of auxiliary fuel, the cargo volume is just under 400 cubic feet. Most customers have not chosen to install all nine auxiliary fuel tanks, so 400 cubic feet is a good estimate of the average cargo volume of a BBJ. FYI, with 400 cubic feet of cargo volume, two tanks are forward of the wing and three are aft; the cargo volume is split between the forward and aft compartments.

*Answer provided by our experts from Boeing Commercial.*

**34) Where can I find informations about standard chair (in regular airplanes) or armchair (in bussinesjet) dimensions ?**

The best bet is to contact seat manufacturers directly, who can provide seat width/depth/height information for their full range of products, from economy class through business to first class. They can also include information on weight and other seat specifications.

I don't have specific contact information, but some of the larger manufacturers (who could be looked up in a reference guide like the World Aviation Directory, or [WAD](#)) include B/E Aerospace, Weber Aircraft, Rumbold, and Recaro.

*Answer provided by our experts from United Airlines.*

**35) I've a question regarding the structure of the fuselage. Is it possible to make local modifications in the structure of the fuselage, and use the tecnology of the other Boeing 737 ?**

It is always possible to modify the structure of the airplane. Some modifications require more changes than others, but the majority of the modifications that business jet conversion shops do retain the basic airplane structure and then add to it.

Although there are many many detail differences between the fuselage of the 737 Next Generation and the previous models, the basic structural layout is almost identical. The seat tracks, floor beams, fuselage frames, overall fuselage shape, etc. are just about the same.

*Answer provided by our experts from Boeing Commercial.*

**36) I noticed that the BBJ has a Cargo door in the aft part of the cabin. I would appreciate if you could send me the detail drawings regarding the structure of this door and the opening system.**

Two cargo doors are installed on the right side of the airplane, one for the forward cargo compartment and one for the aft cargo compartment. The cargo door is an inward opening, plug type design. It has two hinges and one damper/actuator. It can only be opened from the outside, and there's a simple handle mechanism located at ground level for easy access.

*Answer provided by our experts from Boeing Commercial.*

**37) Is it within the rules / parameters for the forward entry door to be substituted with a large combi door from the production combi version of the 737 Next Generation if so desired by a customer?**

The 737-700 Convertible is, with some detail differences, the same as a 737 BBJ with a large cargo door. Like the BBJ it has the beefed up wing and landing gear of the 737-800 and the fuselage dimensions of the 737-700. Currently Boeing Business Jets does not market the Convertible because it is best suited for use in specialty markets (like for the US Navy). However, nothing would stop an operator from buying a Convertible and then outfitting it for business use. Note that the Convertible has the cargo door AND a passenger door on the forward lefthand side of the aircraft.

*Answer provided by our experts from Boeing Commercial.*

**38) Is it possible to send a VHS-tape for a video clip ?**

It is possible to send a VHS video, but only in the European television standard PAL.

*Answer provided by the Admission Committee.*

**39) Can I present my work as 2 x A2 high and 4 x A2 broad ?**

It is not possible for us to hang up 2 x 4 dinA2 charts to one big chart, as we expect a large number of contestants we cannot guarantee so much space for everyone.

*Answer provided by the Admission Committee.*

**40) For international flights is it possible to arrange customs clearance via a privately operated 'terminal' facility or must business jet customers still use the normal customs & clearance facilities?**

Yes. If you pay for it of course. At selected airports, the FBOs (fixed-based operators) can arrange for a customs official to go onboard and take care of the customs procedures. Otherwise the business jets customers will have to go through the normal customs.

*Answer provided by our experts from PCL.*

**41) What is the location and size of the forward upper cargo door - as fitted to the B737-700 convertible?**

The door is approximately 70 inches high by 120 inches wide, starting just forward of the wing (STA500) and extending forward on the left side of the airplane. It is hinged at the top, opens upward, and includes passenger windows at the normal locations.

*Answer provided by our experts from Boeing Commercial.*

**42) Apart from the standard lavatory facility in the B737's front, is it possible to configure the aircraft's 'plumbing' to enable almost random fitment of lavatory facilities - ie anywhere on the aircraft's floor? or are the lavatory locations fixed and correspond to fixed plumbing facilities?**

The standard locations for the lavatories are forward and aft of each of the four main doors (except forward of the forward right-hand door). Putting lavatories in other locations means that non-Boeing plumbing and wiring will have to be added (easily conceivable on a BBJ), plus structural modifications to the floors and ceilings to take the new load.

*Answer provided by our experts from Boeing Commercial.*

**43) How much costs the fly, when this boeing will fly a route from london to new york or amsterdam to kapstadt?**

A crude cost estimation places LHR-JFK around \$10 000, while AMS-CPT is in the vicinity of \$18 000. Regarding costs of the BBJ, the following [link](#) provides more details of the operating costs (by hour), as well as the fixed cost (year base).

*Answer provided by our experts from PCL.*

**44) Can you tell me - how the stewards are serving the meal? do they have small tables with wheels....? What is the normal size?**

Service method varies upon trip length, number of passengers, as well as type of passengers. Most of the time, table is set as it would be in a restaurant, and the service is that of a 5 star restaurant (no tray, no wheeled table). Sometimes, however, tray service is provided. For example, if the owner of the BBJ is a sports team, tray service will be provided, using a cart very similar in size to the ones you find in commercial airplanes.

*Answer provided by our experts from PCL.*

**45) Can we consider locating the air ducts in another location than in the ceiling? Or would this be considered too great a change to the existing configuration of the interior section of the airplane?**

Cabin air comes from the air conditioning packs under the wing center section then moves

up along the walls (where the windows are blocked out just forward of the wing) and into the big airduct at the top in the center of the fuselage. On a passenger airplane, with all the features expected by passengers, this is the most logical place to put the main air distribution duct. Unless there will be very tall passengers or pieces of equipment in the cabin that will interfere with the air duct, it should probably remain where it is. As with all airplane features, though, if a new configuration can be developed and certified, it can be installed. See [FAR25.831](#) for specific requirements.

*Answer provided by our experts from Boeing Commercial.*

**46) For us it is necessary to know the distance between the floor and the bottom of the window.**

The center of the window is 38 inches above the top floor beam. Which means that the bottom of the window is 31 inch above the ground.

*Answer provided by our experts from PCL.*

**47) How much space should be left for the pilots to sleep & personal care (toilet) ? Do they ever use the same services as the passengers (bathroom, kitchen...)?**

Under private aircraft regulations (Part 91), there are no rules regarding pilot rest etc. It is a little bit like having a personal chauffeur for your car, there is no rule stipulating that he/she has to have a place where to rest etc. So the answer would be that there is no amount of space that needs to be left for the pilot. It is nice to give them something though, but there is no obligation – it just depends how much you like/care about your pilot ! About other services, usually the owner of the BBJ has a private bathroom that is not to be used by others and the pilot uses a regular bathroom like those found on commercial flights. Kitchen-wise, there is (usually) only one kitchen.

*Answer provided by our experts from PCL.*

**48) Can showers and WCs be installed anywhere in the cabin? Are there limits to their number?**

Shower and WC can be installed anywhere in the cabin as long as the water lines etc are arranged accordingly. There are no limit to their number, as long as the floor loading limits (FAQ#18) are not exceeded. Note that the amount of water is also limited by the maximum take-off weight.

*Answer provided by our experts from PCL.*

**49) Are there objective reasons, why first class seating is normally positioned towards the front of planes, while sleeping accommodation is more often found towards the rear?**

There are no technical reasons to have first class seating up front and sleeping quarters at the rear. This configuration is usually chosen because this way the passengers don't have to walk through the bedroom to get to their seats.

*Answer provided by our experts from PCL.*

**50) We have seen from the 'New dimensions in Business Travel' brochure that there is one or probably two emergency doors right on top the wings; however from the interiors shown there it looks like the doors are blocked by the furniture, sofas, etc. Is there any safety regulation concerning those doors ?**

The emergency doors on top of wings are very important, but they can be covered with furniture, panels or something else when these things are removable in a short time and with some easy handgrips. Sometimes it is possible to cover the backdoors so that you never use them, but this depends on the regulations of the country in which the aircraft is registered. Both wing emergency doors must be usable like described in any case.

*Answer provided by our experts from Lufthansa Technik.*

**51) In elaborating the BBJ-Design Competition we are planning to show our work in HTML-format. Please tell us, whether HTML-format can be interpreted as a "self-contained and self-running"-animation.**

HTML format is acceptable provided that it is plain HTML or using 'common' free plug-ins (for example RealAudio or Shockwave). Make sure also that the presentation runs smoothly on any computer, without requiring being in a specific folder or drive.

*Answer provided by our experts from PCL.*

**52) How much air at which rate needs to be supplied to the cabin for a. pressure compensation b. oxygen and fresh air supply c. heating and cooling**

At cruise, air supply to the passenger cabin of a 737 is up to  $25\text{ft}^3/\text{sec}$ , depending on the mode in which the aircraft's air conditioning packs are operating. Air is delivered at a cabin altitude of about 8,000 feet. There is no oxygen supplied to the cabin except in emergency situations. Oxygen is highly flammable and is restricted to the emergency cannisters above passenger/attendant seats, one or two mobile units for attendants (though not always), and one large supply bottle for the pilots.

*Answer provided by our experts from Boeing Commercial.*

**53) Can you please tell me how access is made to the jet, are the stairs incorporated in the doorway, or is the stairway airport equipment?**

All BBJ's come with airstairs standard. The door for the airstairs is just below the forward entry door and the stairs (with their railing) retract into a compartment below the floor beams and above the electronics racks. Business jets typically need to be more self-sufficient than airliners, so a BBJ operating into a small airport cannot rely on the airport having the right airstairs available. For non-BBJ aircraft, airstairs are an option, typically exercised by customers who operate into less developed airports.

*Answer provided by our experts from Boeing Commercial.*

**54) Where can i find the distants between the ground and the bottom of the entry-door ?**

This distance is about 8 feet. It will actually depend on how much the nose and main gear struts have been pumped up with nitrogen and on the gross weight of the airplane when the measurement is made.

*Answer provided by our experts from Boeing Commercial.*

**55) What is the total allowable energy consumption of the cabin equipment, lighting, cooling, ventilation and other subsystems?**

The BBJ is equipped with two engine driven generators each providing 90 kilo-volt-amperes in flight or on the ground. In addition, there is an APU driven generator that can provide at least 66 kilo-volt-amperes at the operational ceiling. In addition, heating and cooling is provided via the air conditioning system. This system uses bleed air from both engines. It is sufficient to heat the cabin to 70 degrees F, and cool it to 80 degrees F.

*Answer provided from our experts from Boeing Business Jets.*