

Enclosure

Exponential line loading is used for all four drive units, primarily to achieve freedom from resonance and reflection, but also for the damping effect on the fundamental resonance in the low frequencies.

The two dome units are tightly coupled to their respective wave guides via a hollow pole magnet which causes minimal discontinuity to the advancing wave front.

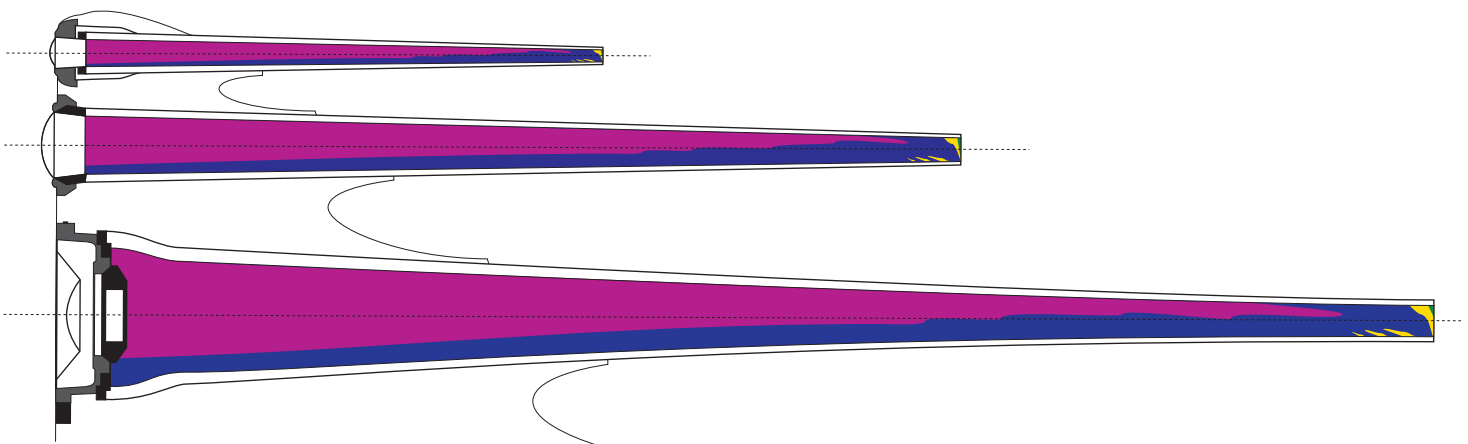
A hollow pole magnet is also to be found behind the lower mid diaphragm supported by a chassis which itself forms the first 50mm of the wave guide. The tube to which this is attached is shaped to smooth the transition from the chassis.

The distinctive natural appearance of Nautilus is derived from the best compromise of folding a tapered tube to save space whilst maintaining the highest curvature-to-width ratio. Traditionally, folded pipes have involved many 180° bends which have serious frequency dependent transmission properties.

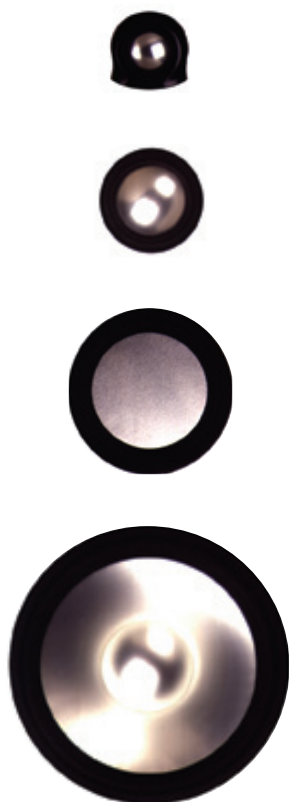
10mm thick Glass Reinforced Plastic (GRP) has been used for the exterior surface which, when coupled with the doubly curved shape, results in an extremely stiff enclosure. The inner turns of the spiral are bounded by a foam filled GRP which braces the opposite faces of the snail in a manner similar to the Matrix type enclosure perfected by Bowers & Wilkins.

The external form of the Nautilus has been achieved using a blend of hand-built forming and advanced CAD technology borrowed from the automotive industry. This enables Bowers & Wilkins to maintain mathematical accuracy of the wave guide and to produce the final mould tool to submillimetric accuracy.

The high gloss surface finish is the result of using a two-part acrylic paint with a deep lacquer coat for lustre and durability. A 50kg block of polished terrazzo type material supports the complete mollusc.



Drive units



Each drive unit has been developed to operate as a piston within its intended frequency band, with two octaves between the upper roll-off and the first sign of break-up modes. Extensive use of aluminium in the diaphragms makes this possible. All voice coils are wound on polyimide formers to eliminate eddy-current losses, which are particularly serious at high frequencies.

A 9.5kg (21lbs) magnet with a 100mm (4in) voice coil acts as the massive motor of the 300mm (12in) bass unit. This, when used in the exponential line enclosure, results in a high-pass behaviour so over-damped that the traditional second-order characteristic is replaced by two distinct first-order slopes and no stored energy.

A 250 micron one-piece aluminium cone/centre dome ensures coherent motion to beyond 1.5kHz. From 220Hz to 880Hz, a 100mm flat-fronted unit is employed to prevent the gentle cavity resonance found in conventional cone units at around 2kHz interfering with the output from the upper midrange unit. A rare earth magnet assembly with hollow pole is used to minimise the obstruction to the rear radiation from the diaphragm.

Two domed units of anodised aluminium of similar construction, 50mm and 25mm in diameter, handle the 880Hz-3.5kHz and 3.5kHz-25kHz ranges respectively. All drive units are completely mounted on silicone rubber O-rings to decouple them from the cabinet.

Crossover

The division of the signal into the four required bandwidths is accomplished in the Nautilus Active Crossover via totally nonresonant circuitry. Both inputs and outputs offer single and balanced operation, the latter being particularly useful in noisy electrical environments, although a slight subjective improvement has been observed when using balanced signal interconnections at every stage.

With suitable pre- and power amplifiers, one unit is required for each loudspeaker and should be sited close to the power amplifiers. A power supply connection for each crossover is required.

Important: your dealer must check that the serial number located at the rear of each crossover unit matches that of the loudspeaker – and that the stated voltage is correct for your mains supply.



Unpacking

These notes will explain in depth how to unpack the plinth and speakers. Inside this crate is a copy of the Nautilus user manual that will show how to connect the Nautilus loudspeaker system.

Attention: Please carefully read through these instructions in full before starting to unpack the product. Unpacking should be carried out by two people due to the weight of the product and awkwardness of the shape.

Note: Remove all watches, rings, bracelets, belts, and any other item of clothing that might scratch the product's surface.

A pair of Nautilus is supplied in three crates. The two larger crates each contain one Nautilus loudspeaker and one active crossover. One of the large crates contains the accessory pack and is marked as such. The small crate contains two stone plinths.

Lay each crate flat on the ground. Open the lids using a number 2 pozidrive screwdriver. Unscrew all screws before lifting the lid off of the crates.

Begin with the small crate, which holds the plinth to support the product. Remove the lid and card separator and set aside. The plinth weighs approximately 50kg, so it requires two people to lift. One person should place a hand into the slot in the plinth and raise one end. The second person should place one hand on either side of the plinth at the opposite end from the slot. Lift the plinth from the crate and gently place it as close as possible to its final installation position. (Please note: the cable cut-out end belongs at the back of the speaker) Repeat these steps for the second plinth.

Place each large crate alongside the plinth or as close as possible to the plinth. Unscrew all the screws holding the lid on the crate. Remove the lid and set aside. Remove the strap, length of wadding and protective cover and place nearby. Remove the two pieces of internal packaging using the handholds provided. Remove the layer of fibre wadding to reveal the speaker, active crossover and accessory pack. Place the active crossover and accessory pack aside.

Depending on the proximity of the plinth to the large crate, it may be possible to feed the wires through the slot in the plinth before

removing the product from the crate. Feed the amplifier end of the cable through the slot in the top of the plinth and guide it into the cable cut-out at the rear of the plinth. (Note: it may be easier to feed the cable through by supporting the rear end of the plinth on the metal rod supplied in the accessory pack. Remove the metal rod once finished.)

Warning: do not lift the speaker using any of its straight tubes or the part of the tweeter enclosure forward of the split line.

One person should grasp the top of the speaker under the main body of the tweeter enclosure. The right hand of the second person should support the speaker on the top of the rounded part of the base, the left hand of the second person should support the speaker on the front of the speaker below the bass unit.

The person supporting the tweeter should lift the speaker tilting it into an upright position while the second person should support the body of the speaker. Before removing the speaker from the crate, place the protective cover over the front of the speaker to prevent damage during moving. Secure the cover with the belt provided, ensuring the length of wadding is placed between the strap and the speaker to protect the enclosure.

To remove the speaker from the crate, the person supporting the speaker should grasp the threaded spigot from which the cable exits at the base of the speaker while the other person supports the front and top of the speaker. Ensure the person holding the spigot is positioned to the rear of the speaker so that they can use their free hand to pull the cable through the plinth as the speakers is lowered

into position. Guide the spigot into the slot in the plinth.

Once the speaker is in place on the plinth, feed first a rubber washer and secondly a metal washer and finally a securing nut from the accessory pack over the free end of the cable and slide them as far as possible to the speaker end.

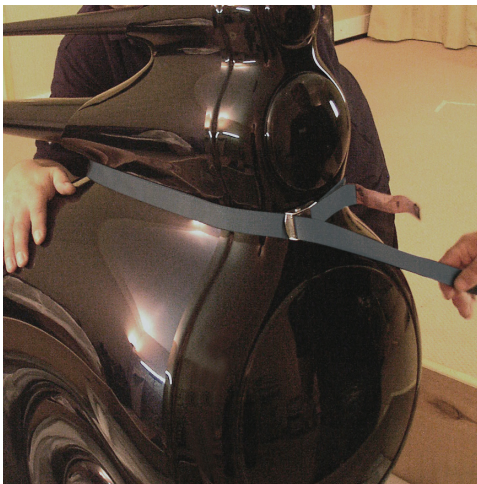
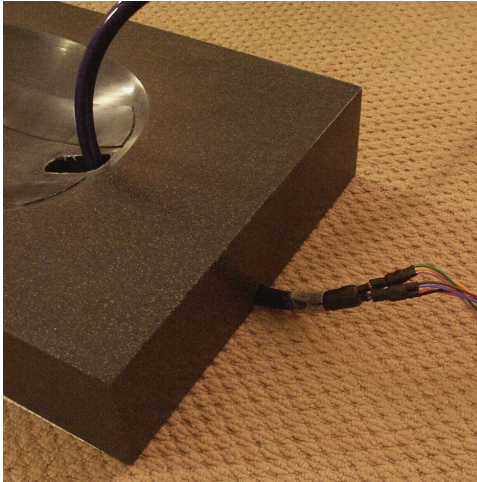
One person should lean the speaker/plinth combination forward to expose the underside of the plinth. While the first person supports the weight of the speaker, the second person should feed the washers over the spigot and screw down the nut, tightening by hand only.

Carefully stand the speaker on its plinth upright and position it as required.

The drive units are delicate and easily damaged. Use the plastic cover to protect them, for example, if the speaker is to remain unused for a long period, or if there are inquisitive children about. Always secure the cover with the strap and length of wadding provided. We suggest you retain the packaging for future use.

Warning: The speaker drive units create stray magnetic fields that extend beyond the boundaries of the enclosure.

We recommend you keep magnetically sensitive articles (CRT type televisions and computer screens, computer discs, audio and video tapes, swipe cards, etc.) at least 1m (40in) from the speaker. This does not apply to plasma or LCD screens.



Positioning

Placement of any loudspeaker can significantly influence the relative balance of sound in the listening seat and we recommend a degree of experimentation. In general it will be found that Nautilus gives optimum results when “toed-in” to a greater extent than in previous systems, set typically at an angle of between 60° and 90°. This is due to the smooth, wide dispersion of Nautilus which is capable of increasing the relative significance of the side-wall reflection.

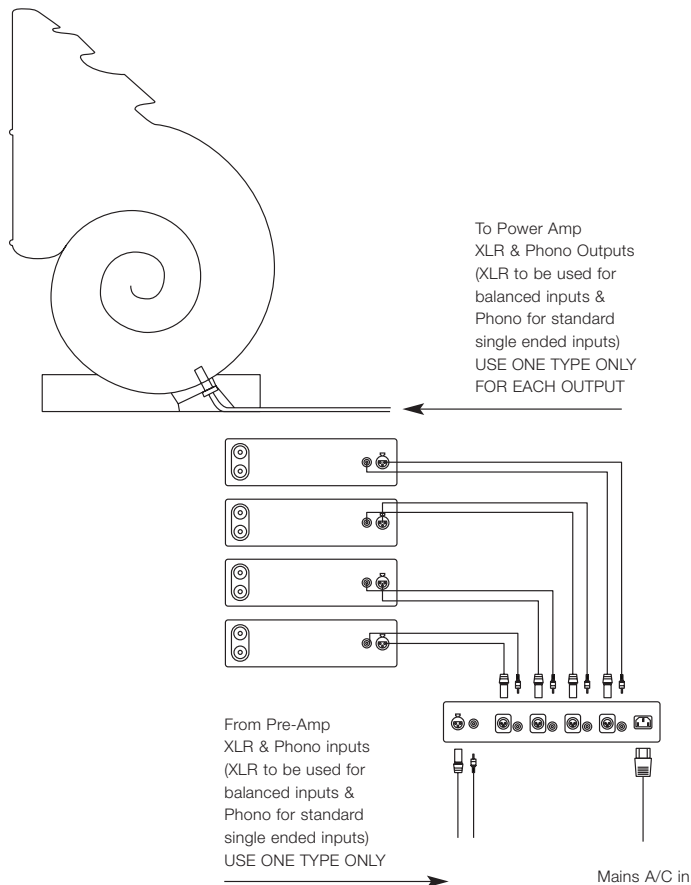
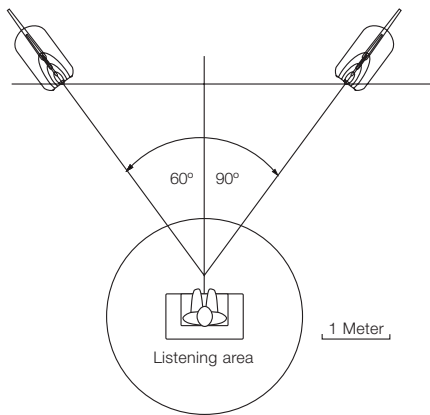
Another benefit of the dispersion characteristic is the substantially increased listening area in which a pleasant and realistic stereo image may be enjoyed.

Installation

All connections should be made with the equipment turned off. Each Nautilus comes with its own dedicated active crossover network. The serial number on the amplifier end of the harness should match the serial number on the rear of the crossover network.

The crossover can be connected to the amplifiers with Phono leads for unbalanced operation or XLR types for balanced operation. Each Nautilus will require 1 separate amplifier channel for each drive unit. The gain and phase of each must be identical.

Each amplifier (channel) should be capable of delivering at least 30V RMS into 6 ohms for realistic levels of reproduction. Most amplifiers capable of delivering 100 watts into 6 ohms should be suitable. Connect each of the 4 crossover outputs (LF, LMF, UMF, HF) in turn to each amplifier or amplifier channel. The loudspeaker harness should then be connected to the appropriate terminals on the corresponding amplifier. The input to the crossover should then be connected to the output of the preamplifier. Connect the power and turn on the crossover, followed by the amplifiers.



Cable connection

High Frequency Unit

+ RED	+ ROT	+ ROUGE	+ ROJO	+ ROSSO
- BLACK	- SCHWARZ	- NOIR	- NEGRO	- NERO
+ LOREM	+ LOREM	+ LOREM	+ LOREM	+ LOREM
- IPSUM	- IPSUM	- IPSUM	- IPSUM	- IPSUM
+ LOREM	+ LOREM	+ LOREM	+ LOREM	
- IPSUM	- IPSUM	- IPSUM	- IPSUM	

Upper Mid Range Unit

+ BROWN	+ BRAUN	+ MARRON	+ MARRON	+ MARRONE
- BLUE	- BLAU	- BLEU	- AZUL	- AZZURRO
+ LOREM	+ LOREM	+ LOREM	+ LOREM	+ LOREM
- IPSUM	- IPSUM	- IPSUM	- IPSUM	- IPSUM
+ LOREM	+ LOREM	+ LOREM	+ LOREM	
- IPSUM	- IPSUM	- IPSUM	- IPSUM	

Lower Mid Range Unit

+ YELLOW	+ GELB	+ JAUNE	+ AMARILLO	+ GIALLO
- GREEN	- GRÜN	- VERT	- VERDE	- VERDE
+ LOREM	+ LOREM	+ LOREM	+ LOREM	+ LOREM
- IPSUM	- IPSUM	- IPSUM	- IPSUM	- IPSUM
+ LOREM	+ LOREM	+ LOREM	+ LOREM	
- IPSUM	- IPSUM	- IPSUM	- IPSUM	

Low Frequency Unit

+ ORANGE	+ ORANGE	+ ORANGE	+ NARANJA	+ ARENCIO
- VIOLET	- VIOLETT	- VIOLET	- VIOLETA	- VIOLETTA
+ LOREM	+ LOREM	+ LOREM	+ LOREM	+ LOREM
- IPSUM	- IPSUM	- IPSUM	- IPSUM	- IPSUM
+ LOREM	+ LOREM	+ LOREM	+ LOREM	
- IPSUM	- IPSUM	- IPSUM	- IPSUM	

Connection to Nautilus is via an 8-core cable of high purity silver on copper, terminated in bare ends to allow the most direct connection to the amplifier terminals.

It is generally accepted that the wires between power amp and driver should be as short as possible, so we do not recommend that the captive cable be lengthened in any way.

In the majority of cases it will be most convenient to locate the crossover units in close proximity to the power amplifiers, with correspondingly short line interconnects. Each cable should be connected directly to the respective outputs of each amplifier.

The line from pre-amplifier and crossover is likely to be comparatively long and should, therefore, be of high quality and low capacitance. It is further recommended that the balanced input of the crossover be used with two-core screened cable – even if the pre-amp is single ended.

In the latter case, the screen and one core should be joined at the source end.



Detail of twin cored screened lead connecting phono to XLR plugs (pre-amp to x-over)

Before fine tuning the installation, double check the polarity and security of the connections.

If the hand-tightened nut that holds the Nautilus to the plinth is not done up sufficiently tightly, it can occasionally work loose. This may create a difficult-to-locate rattle or buzz. The accessory pack includes a rubber washer and a steel washer that should be employed between the plinth and nut to eliminate this problem. The rubber washer should rest against the plinth.

If it is not possible to position the crate near the plinth when unpacking, the pieces of foam covering Nautilus in the crate can be used to support the loudspeaker close to the plinth within reach of the loudspeaker harness.

If you need to alter the tilt of the Nautilus, French chalk is supplied in the accessory pack to ease movement between the speaker and its plinth.

If the level of bass is uneven with frequency, this is usually due to strong excitation of resonance modes in the room. Even small changes in the position of the speakers within the listening room can have a profound effect

on the perceived sound quality by altering the excitation of these modes. Try mounting the speakers along a different wall. Even moving large pieces of furniture about can have an effect.

If the general level of bass is too high, try moving the speakers further away from the walls. Conversely, if you need more bass, move the speakers closer to the walls. Space behind the speakers also improves the impression of perspective on well recorded material.

If the sound is too harsh, increase the amount of soft furnishing in the room. For example, use heavier curtains. Conversely reduce the amount of soft furnishing if the sound is dull and lifeless.

Test for flutter echoes by clapping your hands and listening for rapid repetitions. These can smear the sound, but may be reduced by irregular shaped surfaces such as bookshelves and large pieces of furniture.

As Nautilus is designed in such a way that the units are de-coupled from the enclosure and the base weighs a substantial 42kg.

The GRP cabinets normally only require dusting. If you wish to use an aerosol cleaner, spray onto the cleaning cloth, not directly onto the cabinet.

If the surface of the speaker suffers any minor scratches, they can be polished out with fine T-Cut or finishing compound such as "Finesse It" by 3M.

When making or breaking connections, ensure all power is switched off otherwise damage may result.

Avoid touching the drive units, especially the domes, as damage may result.

Specification



Technical features	Nautilus tube-loading active crossover
Description	4-way tube-loaded loudspeaker system
Drive units	1x ø300mm (12 in) aluminium cone bass 1x ø100mm (4 in) aluminium/polymer sandwich cone lower midrange 1x ø50mm (2 in) aluminium dome upper midrange 1x ø25mm (1 in) aluminium dome high-frequency
Frequency range	-6dB at 10Hz and 25kHz
Frequency response	25Hz - 20kHz ± 1dB on reference axis
Dispersion	Within 2dB of response on reference axis Horizontal: over 60° arc Vertical: over 10° arc
Crossover frequency	220Hz, 880kHz, 3.5kHz
Power amplifier requirements	4 channels per speaker, rated 100W - 300W continuous into 8Ω on unclipped programme (each channel to have identical gain and phase)
Dimensions	Height: 1210mm (47.6 in) Width: 430mm (16.9 in) Depth: 1105mm (43.5 in)
Net weight	Speaker: 44.5kg (98 lb) Plinth: 42kg (92 lb) Total: 86.5kg (190lb)
Standard finishes	Midnight Blue, Black, Silver

