Opus²

USER MANUAL

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Opus² - Stand
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Opus² - AV System
Opus² - Tri Centre
Opus² - Tri Surround
Opus² - SW250 Subwoofer
Opus² - SW300 Subwoofer
Opus² - SW380 Subwoofer

Wharfedale Loudspeakers Ltd
IAG House, Sovereign Court,
Ermine Business Park,
Huntingdon PE29 6XU. England.
Tel : 0845 458 0011 / +44 (0) 1480 447700
Fax : +44 (0) 1480 431767
www.wharfedale.co.uk

Wharfedale

User Cautions

CAUTION!
RISK OF ELECTRIC SHOCK
DO NOT OPEN

TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER-REMOVEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED PERSONNEL

ADVERTISSEMENT: RISQUE DE CHOC ELECTRIQUE- NE PAS OUVRIR

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.

IMPORTANT SAFETY INFORMATION

Read these instructions.
Keep these instructions.
Heed all warnings.
Follow all instructions.
Do not use this apparatus near water.
Clean only with dry cloth.
Do not block any ventilation openings.
Install in accordance with the manufacturer's instructions.
Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
Use only attachments/accessories specified by the manufacturer.

Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

Unplug this apparatus during lightning storms or when unused for long periods of time.
Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
Warning: To reduce the risk of fire or electrical shock, do not expose this product to rain or moisture. The product must not be exposed to dripping and splashing and no object filled with liquids - such as a vase of flowers - should be placed on the product.
No naked flame sources such as candles should be placed on the product.
Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this device.
Warning Opus² Subwoofers: The mains power switch for this appliance is located on the rear panel. To permit free access to this switch, the apparatus must be located in an open area without any obstructions.
NOTE: Opus² Subwoofers:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

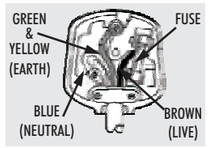
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

IMPORTANT NOTICE TO UK USERS

The power cord on your subwoofer may be supplied with a plug incorporating a fuse, the value of which is indicated on the pin face of the plug. Should the fuse need to be replaced, an ASTA or BSI approved BS1362 fuse must be used of the same rating. If the plug is cut off it must NOT be re-used. Dispose of any such plug safely. There is a danger of electric shock if a cut-off plug is inserted into a mains socket.

Connecting a Mains Plug

The wires in the mains lead are coloured in accordance with the code: Blue: NEUTRAL, Brown: LIVE: Green/Yellow: Earth.



As these colours may not correspond to the coloured markings identifying the terminals in your plug, proceed as follows: The BLUE wire must be connected to the terminal marked with the letter N or coloured BLUE or BLACK. The BROWN wire must be connected to the terminal marked with the letter L or coloured BROWN or RED. The GREEN/YELLOW wire must be connected to the terminal marked with the letter E or coloured GREEN or marked with the symbol ⏚

Conclusion

Quality Management

Your Opus loudspeakers have been constructed to the highest standards of quality throughout. The acoustic components and the whole system have been manufactured to very tight tolerances of +/- 1 decibel of sound pressure level for each driver throughout the operational range of the unit.

All drive unit components are serially numbered and test compared to golden reference originals retained in our factory quality control department. This scrupulous attention to detail enables us to ensure not only that all Opus² loudspeakers exactly replicate the performance characteristics of our reference test samples, it also enables us to give a extended guarantee of identical replacement parts should they ever be required.

A certificate of conformance to the original prototype specification, confirmed by the Opus designer and engineering director is included in this pack.

Servicing

Servicing of Opus products should only be carried out by authorised service agents. If service is required the equipment should be returned, securely packaged, preferably using original packaging, to your dealer.

In the UK equipment may be returned to the IAG Service Centre. In the USA equipment may be returned to the Service address shown on this page. Always telephone before returning any equipment. A note should be enclosed giving your name, address, telephone number, and a brief description of the reason for return.

If you require Service outside the Warranty period, do not hesitate to contact your dealer.

Service Addresses

For technical support, servicing or product queries and information please contact either your local retailer or the offices below.

UK

Wharfedale International Ltd.,
Unit 4
St Margaret's Way
Stukeley Meadows Industrial Estate
Huntingdon
Cambs
PE29 6EB
England
Tel:+44 (0)1480 452561
Fax: +44 (0)1480 413403

USA

IAG America, Inc.
8440 154th Avenue NE
Redmond, Washington 98052
USA
Tel: +1 425 861 3909
Fax: +1 425 861 3906

Asia

IAG
Room 2310 - 2311 Press Building,
Shennan Road C,
Shenzhen,
China
Tel: +86-755-82091200
Fax: +86-755-82091205

Produced after 13th August 2005.
Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist.
Check with your Local Authority or retailer for recycling advice.

Opus²

Contents

Within This Pack

- Certificate of Quality Assurance
- White Cotton Gloves
- Accessories

Before You Begin...

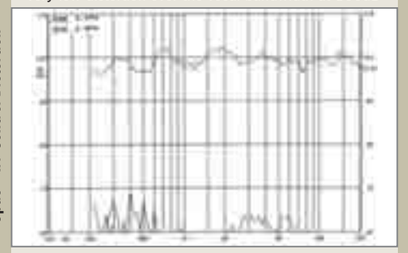
Before connecting and using your loudspeakers, please bear the following points in mind:

- Switch off the amplifier and all sources before making connections to your sound system. When you switch on the system or change sources, set the volume control to minimum and turn up the level gradually.
- The position of your Volume Control is NOT a reliable guide as to the maximum capabilities of your sound system. Playing the system with extreme settings of volume and tone controls may damage the amplifier and loudspeakers.
- Do not connect loudspeaker terminals to the mains supply.
- Ensure that your loudspeakers are correctly wired and are in phase.Do not subject your loudspeakers to excessive cold, heat or sunlight.
- WARNING: To reduce the risk of fire or electrical shock do not expose this product to rain or moisture. The product must not be exposed to dripping and splashing and no object filled with liquids - such as a vase of flowers - should be placed on the product.
- No naked flame sources - such as candles - must be placed on the product.Do not place heavy objects on top of loudspeaker cabinets. If you play the loudspeakers with the grilles removed be careful to protect the drive units from children and pets.
- Do not use makeshift stands. Always fit a manufacturer's approved stand using the instructions and the fixings provided. Your dealer will advise you.
- Do not attempt to dismantle the loudspeaker. There are no user serviceable parts inside and you will invalidate the warranty.
- All the Front and Centre loudspeakers are screened, but you should site front loudspeakers at least 0.5 m away from TV sets and magnetic storage media. The Opus² Tri-Centre and the AvCentre loudspeakers may safely be operated close to a TV set.
- When connecting your loudspeakers, do not run cable across areas of open floor where they may be a source of danger. Run them safely, around room boundaries if necessary.

Measurement and Analysis-2

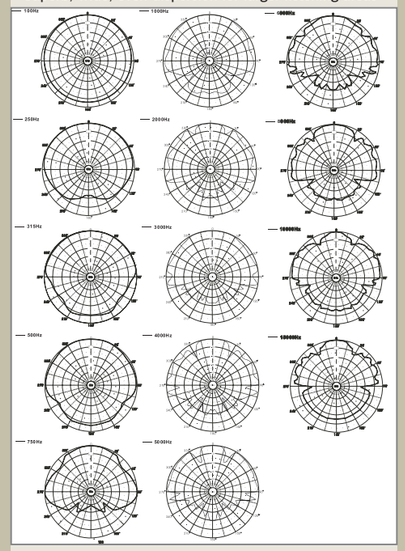
Opus² -Tri-Centre: Distortion

Very low distortion over the vocal bandwidth at 100dB



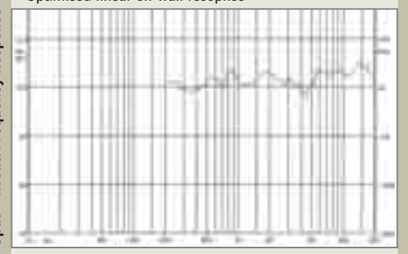
Opus² - Tri-Surround: Horizontal Directivity

Superb, wide, even dispersion for larger listening areas



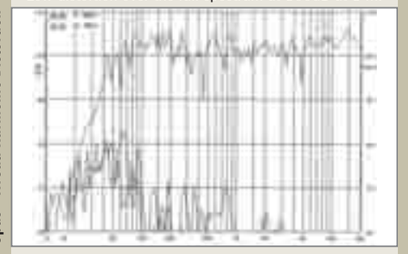
Opus² - AvSat: Frequency Response

Optimised linear on-wall resopnse



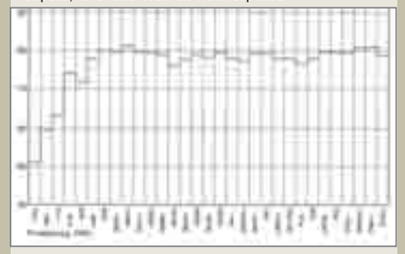
Opus² -AvSat: Harmonic Distortion

Low distortion over the full spectrum at 100dB at 1 m.



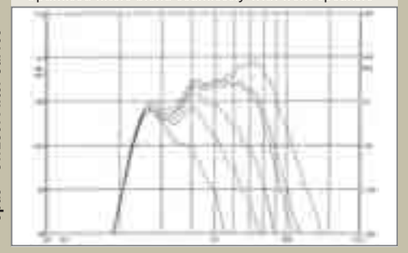
Opus² -AvCentre: Near-Wall Response

Superb, level and even on-wall response



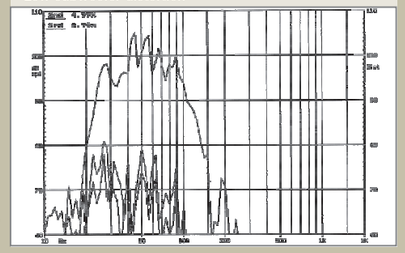
Opus² - SW250: Filter Curves

Optimised filters blend seamlessly with front speakers



Opus² - SW250: 2nd and 3rd HD

Low subwoofer distortion

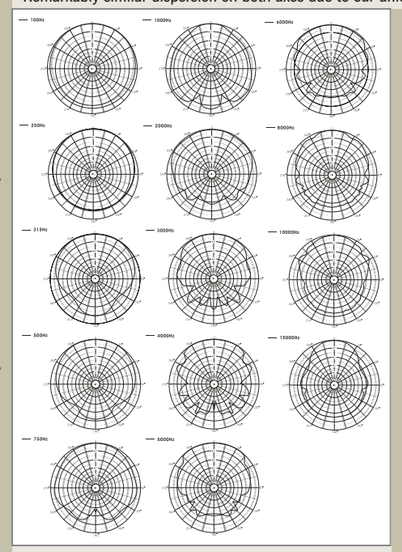


Measurement and Analysis- I

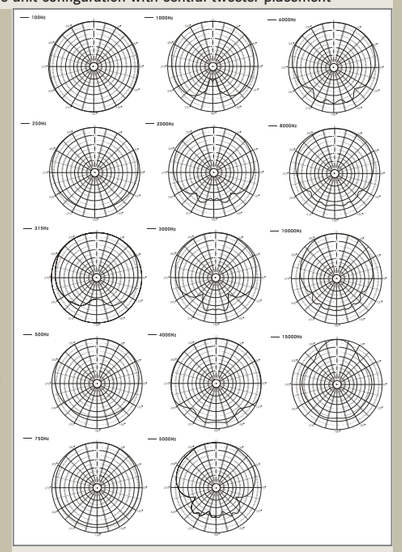
These actual test plots exemplify the stringent standards of acoustical measurement and performance in Opus² loudspeakers.

Remarkably similar dispersion oh both axes due to our unique drive unit configuration with central tweeter placement

Opus² -M1: Vertical Directivity



Opus² -M1: Horizontal Directivity

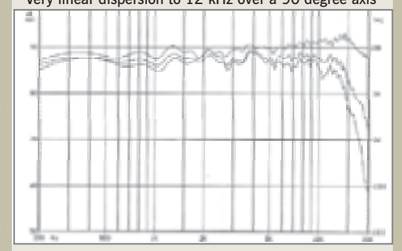


Very smooth response near boundary (200mm)

Opus² -M2: Near-Wall Response

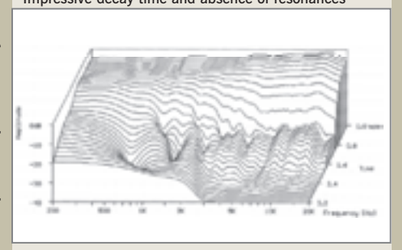
Very linear dispersion to 12 kHz over a 90 degree axis

Opus² -1: Axial Response 0;30;45°



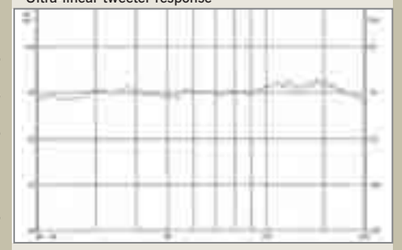
Impressive decay time and absence of resonances

Opus² -1: Spectral Decay



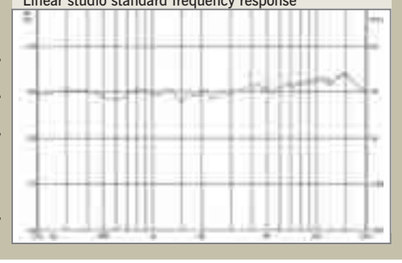
Ultra-linear tweeter response

Opus² -2: Frequency Response



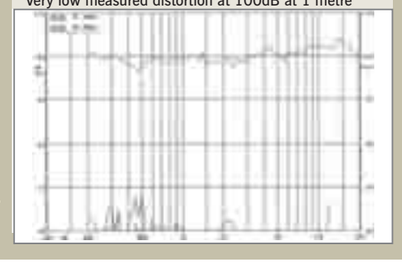
Linear studio standard frequency response

Opus² -3: Frequency Response



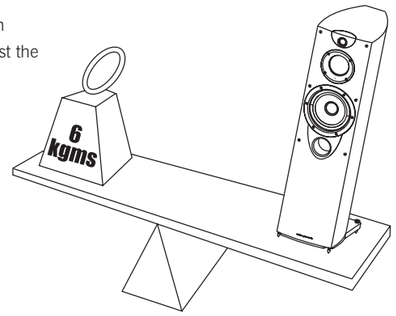
Very low measured distortion at 100dB at 1 metre

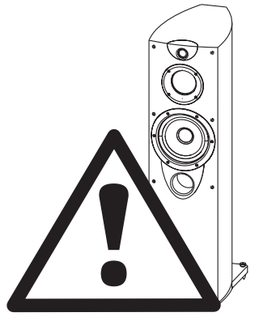
Opus² -3: 2nd and 3rd HD



Safely Unpacking Your Loudspeakers

Opus speakers are heavy. Take care when removing them from their packaging. Enlist the help of a friend if necessary



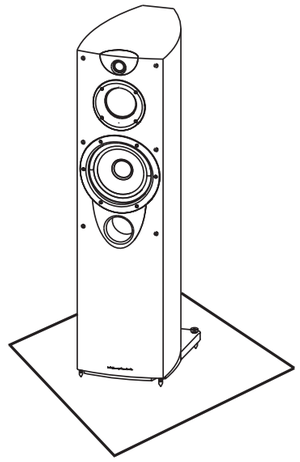


Always take care when lifting heavy objects. Lift the speakers out by their sides.

Unpacking the Opus² 1,2 &3

If your floor is at all vulnerable, protect the floor surface with a cloth or towel. Carefully remove each loudspeaker from its packing carton. Be especially careful when removing the polythene bag. The speakers come with the plinth complete and already fitted. The carton top says, “Open other end”. So you:

– Open the bottom
– Remove polystyrene
– Lift the grille carton out
– Open bag containing speaker
– Tape the carton flaps back
– Turn over carton with loudspeaker still inside
– Lift carton off, leaving loudspeaker standing on the floor
– Unwrap the grilles and place them on the loudspeakers.
– Be careful not to damage soft floor surfaces with spikes



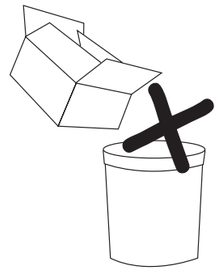
Unpacking the Opus² M1, M2, AV, Tri-Centre & Tri-Surround

Lift out the polystyrene packing pieces and unpack the loudspeakers being careful not to lift the loudspeakers out with the polythene bags. Remove the polythene bags.
The AV speakers are packed as a system with two AVS satellites and one AVC centre loudspeaker.

If possible, keep the packaging in case you need to move or return your speakers. If you dispose of the packing, do so with regard to all recycling regulations in your area.

Unpacking the Opus² Stands

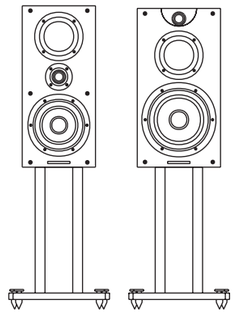
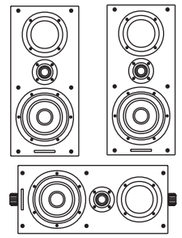
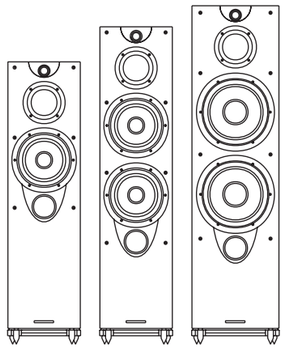
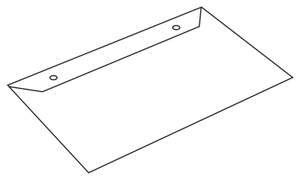
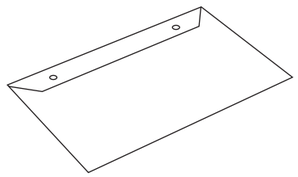
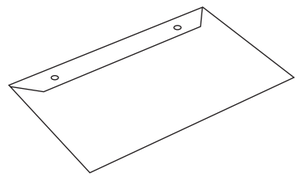
Before proceeding, protect the floor surface with a cloth or towel. The stands are packed facing each other. Lift each stand out from the packing and then invert it so that the spikes are on the floor.



Unpacking the Opus² SW250,300 and 380 Subwoofers

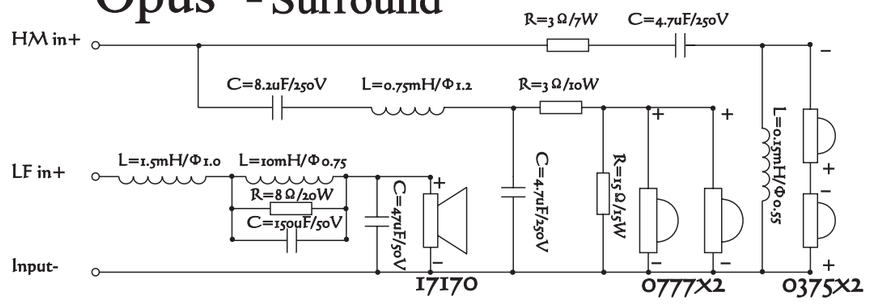
Open the carton and remove all the top packing pieces. Lift the subwoofer out taking care not to damage the cabinet. When lifting the unit from the carton support it from the bottom. DO NOT attempt to lift the subwoofer out of the carton using the polythene bag. The unit is heavy; if you cannot manage it easily, get someone to assist you.

What's In The Box?

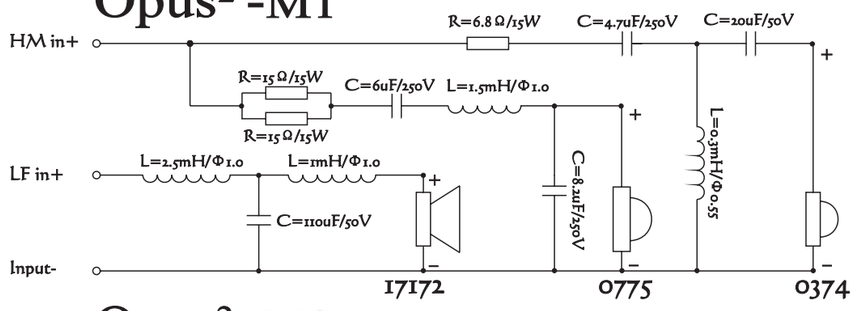
 Opus² -M1, M2, Stands	 Opus² -AV System	 Opus² -1, 2, 3
 User Pack	 User Pack	 User Pack
Accessories: Opus² - M1, M2 • One Pair of Gloves • 8 Rubber Feet Opus² - Stands • Soft Floor Spike Seats (2 Sets) • One Pair of Gloves	Accessories: • One Pair of Gloves • 9 Screw headers • 3 Security Ties • 3 Tie Screws & Washers • 2 "L" Brackets • 2 Bracket Knobs	Accessories: • Two Pairs of Gloves • Soft Floor Spike Seats (1 Set) • One Pair of Bi-Wire Likks

Crossover Network Topology -2

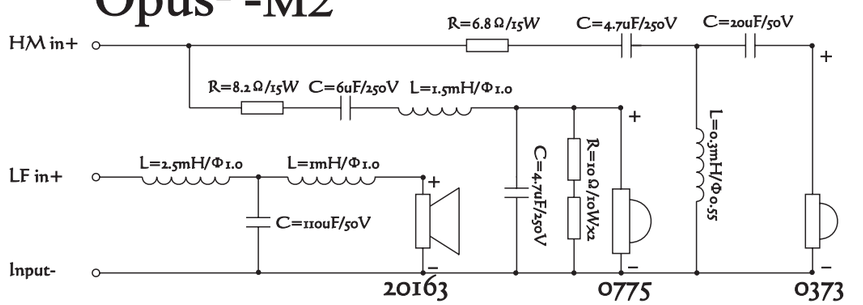
Opus² - Surround



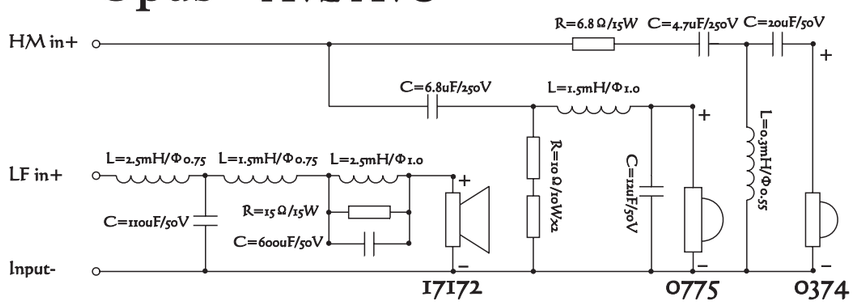
Opus² -M1



Opus² -M2



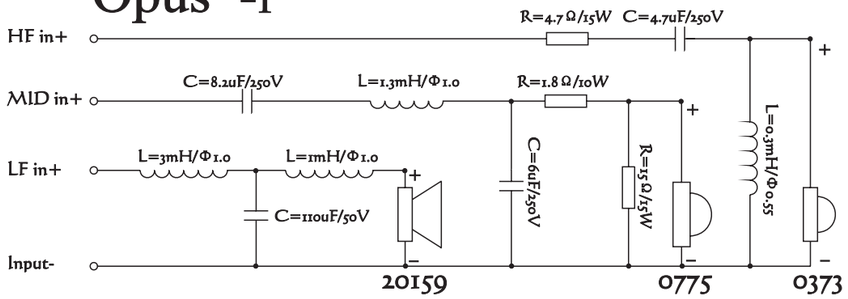
Opus² -AvS/AvC



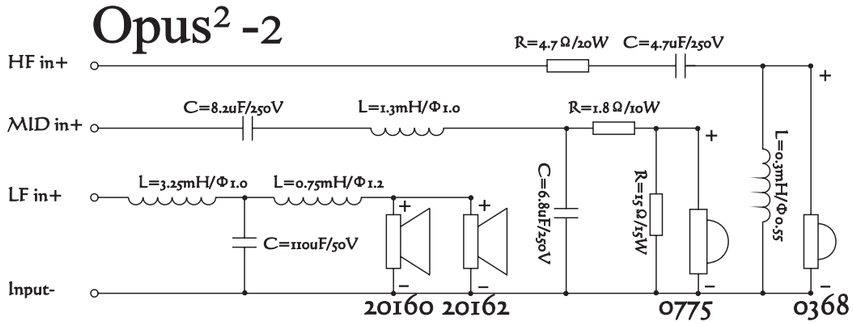
Opus²

Crossover Network Topology - 1

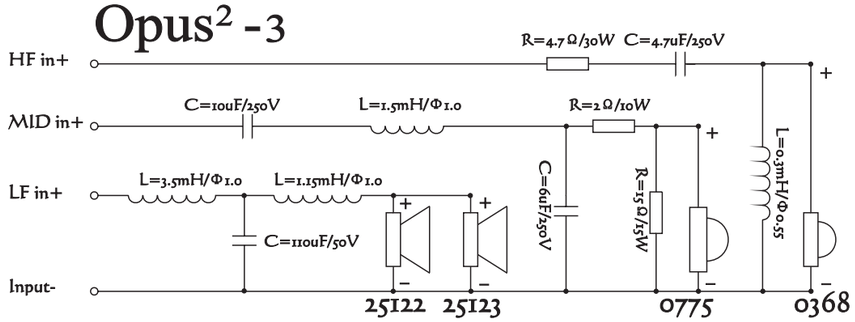
Opus² -1



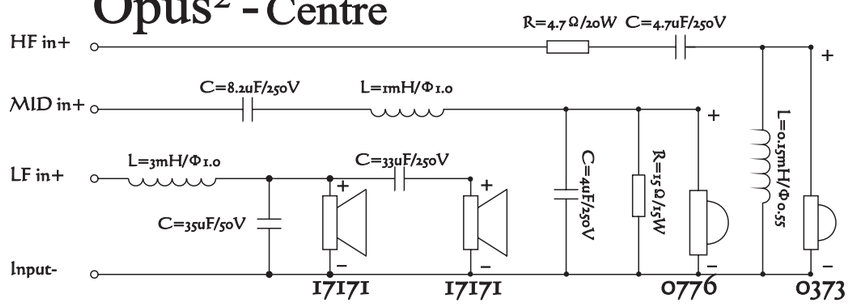
Opus² -2

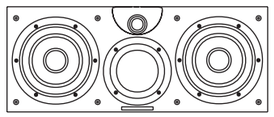
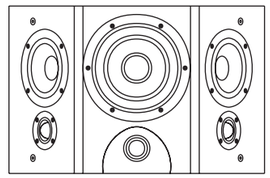
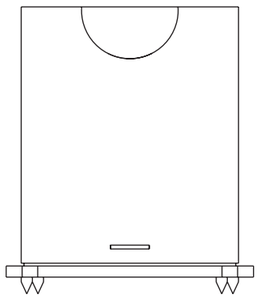
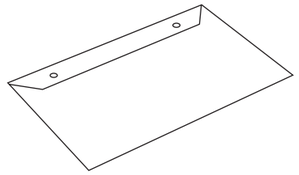
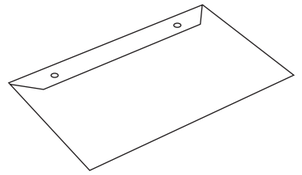
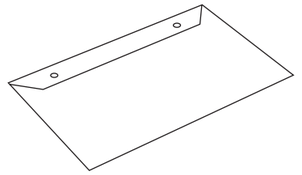


Opus² -3

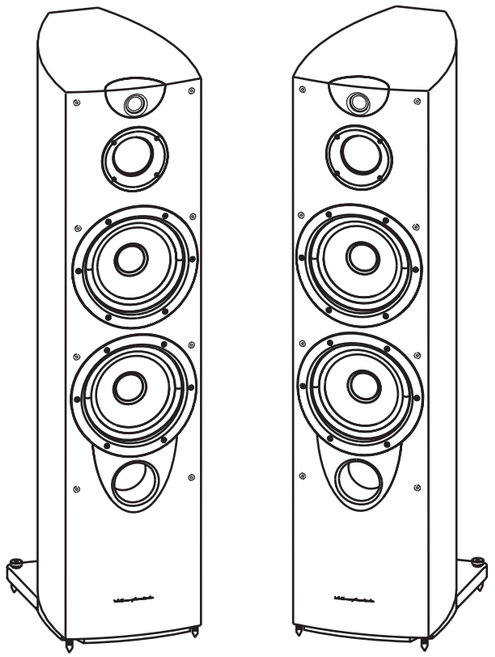


Opus² - Centre



 Opus² - Tri-Centre	 Opus² - Tri-Surround	 Opus² - Subwoofers
 User Pack	 User Pack	 User Pack
Accessories: • One Pair of Gloves • 4 Rubber Feet • One Pair of Bi-Wire Links	Accessories: • One Pair of Gloves • 4 Screw Headers • 2 Security Ties, • 2 Tie Screws and Washers	Accessories: • Two Pairs of Gloves • Soft Floor Spike Seats (4) • Remote Control Handset • 2 Batteries • Power Cord

Setting Up Your Loudspeakers



Subwoofer Drive Unit Specifications

As we design and manufacture our own drive units entirely in-house, we are able to design the perfect driver for each situation.

Our unique 'Tri-lam' technology produces drivers capable of delivering spectacular bass performance with distortion lower than any other drivers of similar size.

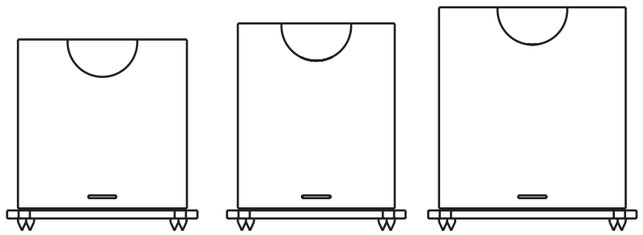
The aim of any large format driver is to have a linear pistonic motion with the minimum cone distortion and break-up possible, even when driven extremely hard. Our 'Tri-Lam cone achieves this using a combination of Carbon fibre and glass fibre.

The cone material is a composite construction comprising of a hydraulically moulded and thermoset lamination of three layers. The inner layer is bi-directional carbon weave, the outer two layers are a bi-directional glass fibre weave. In addition, the outer rim includes 'rim-edge stiffening' to further reinforce the resulting cone.

The result is a cone that is light yet incredibly strong, ensuring very low energy losses, even at extreme levels, and without the 'muddy' delays associated with lesser cone materials.

Parameter	Opus² - SW 250	Opus² - SW 300	Opus² - SW 380
			
Frame material	Aluminium	Aluminium	Aluminium
Cone & dome material	Tri-lam glass/carbon	Tri-lam glass/carbon	Tri-lam glass/carbon
Surround	s r b p Single roll	s r b p Single roll	s r b p Single roll
Spiders	Single	Single	Dual
Coil size & type	51.3mm Al: 4 Layer	51.3mm Al: 4 Layer	51.3mm Al: 4 Layer
Magnet weight	2380gm	2420gm	2720gm
Gap flux density	0.77T	1.1T	1.1T
Top plate thickness	8mm	8mm	10mm
Optimum working range	30Hz- 800Hz	31Hz- 800Hz	35Hz- 500Hz
Thiele Small parameters			
Effective cone diameter	250 mm	300 mm	380 mm
Re	6.2 Ω	6.2 Ω	6.2 Ω
Fs	30Hz	31Hz	35Hz
Qms	5.94	4.79	6.04
Qes	0.39	0.45	0.57
Qts	0.36	0.41	0.52
Mms	100gm	76.9gm	185gm
Cms	0.29mm/N	0.33mm/N	0.11mm/N
Vas	39L	140.4L	112L
BL	17.24N/A	14.67N/A	21N/A

Subwoofer Specifications



Parameter	Opus² - SW 250	Opus² - SW 300	Opus² - SW 380
Transducer Complement	One	One	One
Bass driver	10" 250 mm	12" 300mm	15" 380mm
Input Impedance	10kΩ	10kΩ	10kΩ
Frequency response (boundary)	30 - 100 Hz	25 - 95 Hz	25 - 95 Hz
Avg. max output @ 1m	113db	114db	120db
Low pass filter range	35 - 85Hz in 10 Hz steps	35 - 85hz in 10 Hz steps	35 - 85Hz in 10 Hz steps
Amplifier Output Power (RMS)	250 Watts	300 Watts	600 Watts
Line Input sensitivity (150W output)	325mv	325mv	325mv
Enclosure type	sealed	sealed	sealed
Cabinet-Wall Offset	60 mm	80 mm	80 mm
Construction material	25mm MDF	25mm MDF	25mm MDF
Finish	Selected wood veneers in high gloss piano lacquer finish to match Opus² loudspeakers		
Overall dimensions H x W x D	420 x 420 x 375 mm	520 x 390 x 450 mm	570 x 465 x 570 mm
Net Weight	27 kg	29.5 kg	40.5 kg

The SW series of subwoofers offers a level of performance previously unheard of in their class.

Revolutionary drive units, amplifier modules and filter stages feature on every model. They strike the perfect balance between power and sound quality, offering remarkable sound pressure levels, yet retaining enough control to satisfy the most discerning audiophile and music lover. This is possible only through the use of space-age materials and cutting-edge technology in our drive units.

Solid, well-engineered power amplifiers, dedicated to the production of low frequency energy are used across the range. Power is targeted specifically at the most important section of the bass spectrum , with very little loss and a controlled roll-off allowing for superb integration with all hi-fi and home cinema systems.

The filter section controls the integration with your main speakers and ensures the transition is seamless. Designed using six discrete circuits, signal purity is regarded as paramount. Each circuit has a different crossover frequency (35 Hz to 85 Hz in 10 Hz steps). The filter is 24 dB/octave. In each model it is possible to switch off all filters and allow the AV processor to control the effective frequency range of the subwoofer. This is preferable in high-end systems.

Finally, the Tri-lam cone is revolutionary in terms of technology and performance. Detailed on the next page, it is one of the most advanced cones ever seen in a moving-coil loudspeaker, coupled with an elongated voice coil with a maximum excursion of 24mm.

Preparing Your Loudspeakers

Adjusting Spikes

Floor standing Opus² loudspeakers, the Opus² subwoofers and the loudspeaker stand come pre-fitted with the plinth and spikes.

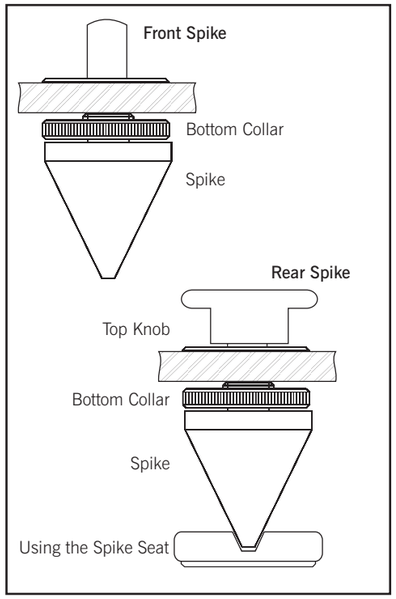
Adjusting the Front Spikes: Slacken the retaining collar at the bottom of the spike. Adjust the spike in and out as required. Do not re-tighten the spikes at this time.

Adjusting the Rear Spikes: Slacken the retaining collar at the bottom of the spike. Release the locking knob on the top. Turn spike out and down to level.

When the loudspeakers are level: Re-lock top knob and then tighten all the collars. Make sure the spikes are fully tightened.

If you are using the Opus² stands to support the M1 or M2, we suggest you level the stand ***before*** you place the speakers on them.

WARNING: Opus speakers and stands are heavy and the spikes could penetrate softer floor materials over extended periods. Spike seats are supplied to protect sensitive floors and floor coverings.



Choosing Loudspeaker Cable

Specialist audio cable usually offers better performance than general purpose 'bell' or 'zip' wire.

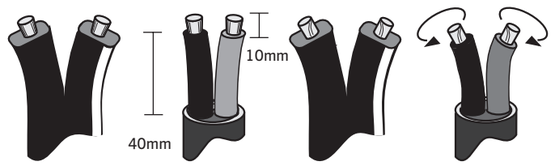
Choose a cable of suitable diameter – cable that is too thin will limit the dynamics of the sound and may impair the bass response. Audio cable is polarised, with two cores of different colours, or often a raised rib or coloured tracer in the case of twin cable.

Before you purchase your cable, we suggest that you give careful thought to the positioning of your loudspeakers. This is especially the case if you are bi- or tri-wiring your loudspeakers.

Cable lengths to loudspeaker pairs should be the same for left and right channels in order to equalise the signal transmission. Allow some slack in your speaker cables so you can alter their position to best advantage, but do not have your cables over-long.

Preparing Loudspeaker Cable

Split the twin cores to a depth of about 40mm. Carefully strip the insulation from each end, leaving about 10mm of bare wire. If the cable is stranded, lightly twist to gather any loose strands.



Connections And Terminals

Crossover Networks

Opus² -1,2,3 and Tri-Centre loudspeakers use a specially designed tri-wireable crossover panel with six terminal binding posts. This facilitates standard single wiring, advanced bi-wiring, and for the no-compromise audiophile, tri-wiring. Follow the drawing carefully to see the correct orientation of the loudspeaker terminals. The upper terminals connect to the treble unit, the middle pair to the mid-range and the lower pair to the bass units. As supplied, the treble terminal pair is connected to the mid-range pair and bass terminal pair via removable metal straps. These should be left in place for standard single cable installations. A second bi-wiring strap is provided which connects the bass and midrange terminal pairs leaving the treble pair to be separately wired. Refer to the diagrams opposite

Opus² -M1 and M2 loudspeakers use a bi-wiring panel essentially similar to the tri-wiring panel above but with four terminal binding posts. This facilitates standard single wiring, and advanced bi-wiring. Follow the drawing carefully to see the correct orientation of the loudspeaker terminals. The upper terminals connect to the midrange and treble units, the lower pair to the bass unit. Although the loudspeakers are full three-way designs, bi-wiring terminals perform admirably in these loudspeakers' intended applications without the added complexity and cost of a full tri-wiring configuration.

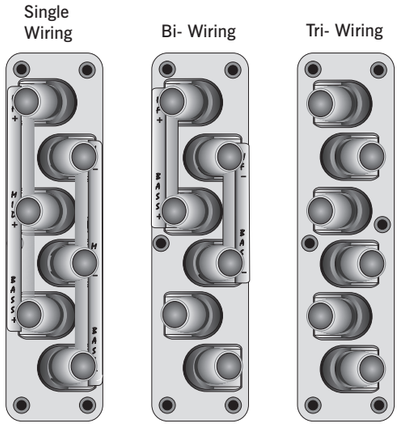
The terminal straps are left and right handed for identification.

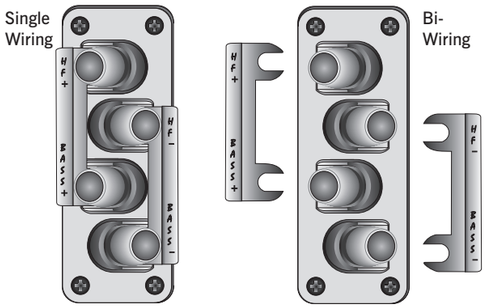
The Opus² -Tri-surround, AVS and AVC loudspeakers use a bi-wiring panel as shown on the right. These have the treble and bass terminal pairs in a vertical configuration with and again these are connected by removable straps to facilitate single and bi-wiring. Follow the drawing carefully to see the correct orientation of the loudspeaker terminals. The upper terminals connect to the treble and midrange units, the lower pair to the bass unit.

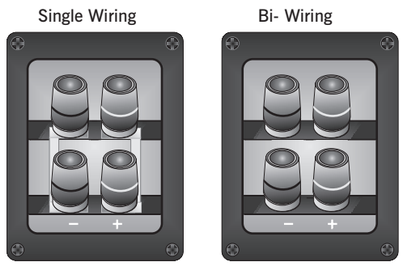
Connecting a Terminal

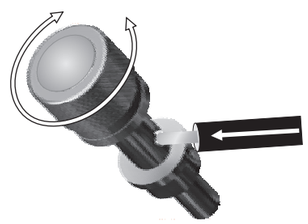
Unscrew the terminal. Insert the bare end of the cable into the hole in the base of the terminal. Tighten securely. When connecting terminals make sure you leave no strands of bare wire that can short across to adjacent terminals.

As an alternative to bare wire you can use specialist spade connectors. Your Opus dealer will be pleased to advise you.









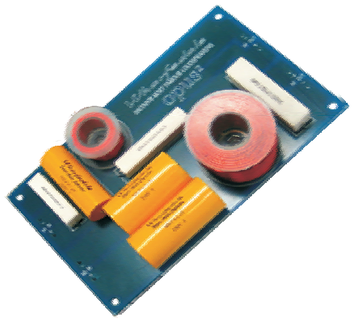
Midrange Specifications

Part number	0775 & 0776
Dome material & size	75mm textile
Coil size & type	75mm aluminium
Magnet d1 x d2 x h	70 x 32 x 15
Magnet weight	248gm
SPL 1w @ 1m	93dB
Fs	500Hz
Frequency range -3dB	400Hz–5kHz
Distortion at 100dB @ 1m	typically < 1%

Tweeter Specifications

Part number	0373, 0374, 0375, 0368
Dome material & size	25mm textile
Coil size & type	25mm aluminium
Magnet d1 x h	25.4 x 4mm Neodynium
Magnet weight	14gm
SPL 1w @ 1m	92dB & 94dB
Fs	1 kHz
Frequency range -3dB	800Hz–40kHz
Upper frequency limit -	45kHz

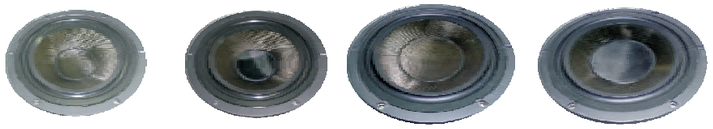
Crossover Specifications



Crossover sections	3 way
Type	Butterworth
Wiring	Triple Wire Plaited OFC
Connections	Amp/solder
Crossover points at -6dB	600 & 750Hz; 900 Hz
Bass	400 & 900Hz
mid	3000–4000Hz
Tweeter	3000–4000Hz

Bass Drive Unit Specifications

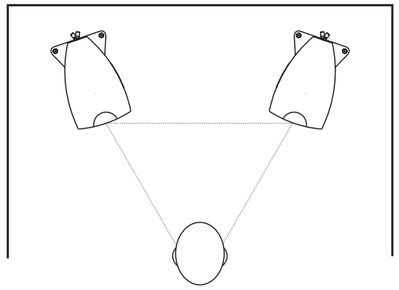
Parameter	Opus² Tri-Centre	Opus² Tri-Surround	Opus² M1 & Av	Opus² M2	Opus² 1
Nominal size	170mm 6.5"	170mm 6.5"	170mm 6.5"	200mm 8"	200mm 8"
Frame material	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Cone & dome material	Tri-lam glass/carbon	Tri-lam glass/carbon	Tri-lam glass/carbon	Tri-lam glass/carbon	Woven carbon fibre
Surround	srbp Single roll	srbp Single roll	srbp Single roll	srbp Single roll	srbp Single roll
Coil size & type	25mm Al; 2 Layer	25mm Al; 2 Layer	25mm Al: 4 Layer	38mm Al; 4 Layer	38mm Al: 2 Layer
Magnet weight	557g	347g	557g	920g	920 g
Gap flux density	0.77T	0.77T	0.77T	1.1T	1.1T
Top plate thickness	6mm	6mm	6mm	6mm	6mm
Optimum working range	40Hz- 1000Hz	40Hz- 1000Hz	40Hz- 1000Hz	25Hz- 800Hz	25Hz- 800Hz
Thiele Small parameters					
Effective cone diameter	140mm	140mm	140mm	165mm	165mm
Re	14.5Ω	3.4Ω	3.4Ω	3.6Ω	3.6Ω
Fs	52.16Hz	64.34Hz	37Hz	26.20Hz	31.96Hz
Qms	3.12	5.25	4.74	3.28	2.93
Qes	0.73	0.85	0.51	0.42	0.4
Qts	0.59	0.73	0.46	0.37	0.35
Mms	15.71gm	16.68gm	23.87gm	38.01gm	28.11gm
Cms	0.59mm/N	0.37mm/N	0.76mm/N	0.97mm/N	0.88mm/N
Vas	19.62L	12.14L	25.26L	61.96L	56.42L
BL	10.09	5.21	6.12	7.33t/m	7.15t/m



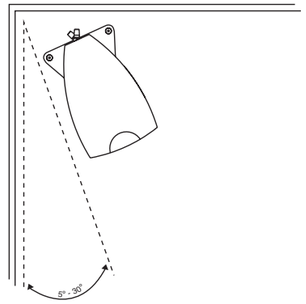
Parameter	Opus² 2 Bass Mid	Opus² 2 Bass	Opus² 3 Bass Mid	Opus² 3 Bass
Nominal size	200mm 8"	200mm 8"	250mm 10"	250mm 10"
Frame material	Aluminium	Aluminium	Aluminium	Aluminium
Cone & dome material	Woven carbon fibre	Woven carbon fibre	Woven carbon fibre	Woven carbon fibre
Surround	srbp Single roll	srbp Single roll	srbp Single roll	srbp Single roll
Coil size & type	38mm Al: 2 Layer	38mm Al: 2 Layer	38mm Al: 2 Layer	38mm Al: 2 Layer
Magnet weight	920 g	920g	920g	920g
Gap flux density	1.1T	1.1T	1.1T	1.1T
Top plate thickness	6mm	6mm	6mm	6mm
Optimum working range	25Hz- 800Hz	25Hz- 800Hz	25Hz- 500Hz	25Hz- 500Hz
Thiele Small parameters				
Effective cone diameter	165mm	165mm	200mm	200mm
Re	7.2Ω	7.2Ω	7.2Ω	7.2Ω
Fs	34.90Hz	32.88Hz	51.70Hz	40.26Hz
Qms	2.87	2.61	4.31	4.47
Qes	0.65	0.78	1.19	1.13
Qts	0.53	0.6	0.93	0.9
Mms	24.31gm	25gm	31.76gm	33.05
Cms	0.80mm/N	0.94mm/N	0.30mm/N	0.47mm/N
Vas	54.62L	59.84L	41.13L	65.17L
BL	7.71t/m	6.91t/m	7.91t/m	7.29t/m

Positioning Stereo Loudspeakers

The distance between the speakers should be the same as between you and the speakers.



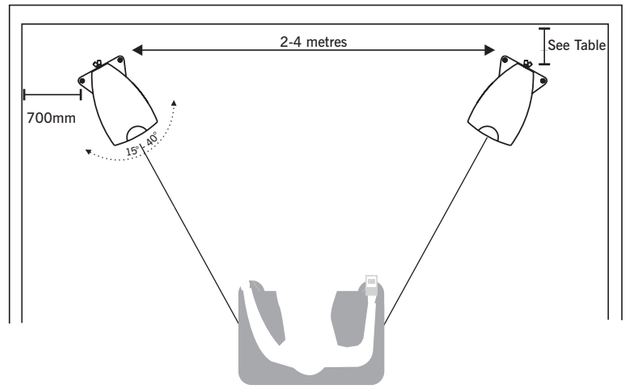
Angle speakers inwards for a more precise stereo image

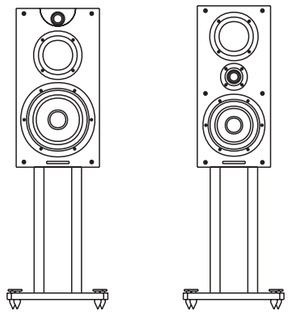


If the loudspeakers are placed too close to the walls the bass will increase but may be boomy and indistinct. If the loudspeakers are placed further away from the walls, the inward angle ("toe in") may be increased by up to 40%, although this may restrict the width of the optimum listening position. As personal taste plays a large role, experiment with different configurations and play a wide range of programme before finalising the position of your speakers.

The table below shows the ideal distance your model should be from the wall

- **Opus² M1:** 300mm
- **Opus² M2** : 200mm
- **OPus² 1 :** 300mm
- **OPus² 2** : 100mm
- **OPus² 3** : 100mm
- **Opus² Subwoofers:** up to 100 mm





Opus² M1 and M2

The M1 and M2 are designed for stand mounting. The Opus Stand has been specifically designed to optimise their performance. As an alternative the M1 and M2 may be wall mounted on rigid brackets or placed on rigid shelves.

Ideally the top of the speaker should be at ear level to a seated listener. If the rear panels of the speakers are placed close to the walls the amount of bass will be increased but the clarity may well suffer - you should experiment until you get the best result.

Opus²

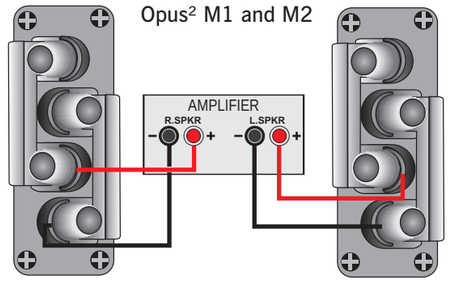
Connecting Stereo Loudspeakers -1

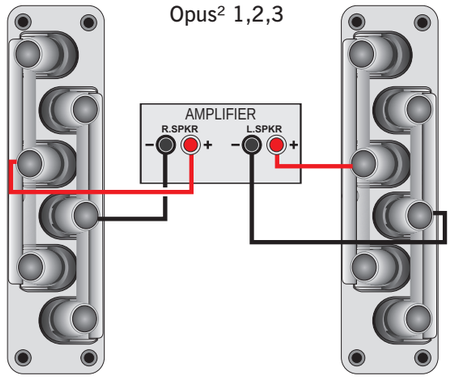
Standard Loudspeaker Wiring

Choose a suitable length of twin core speaker cable for each channel, and prepare the ends. Unscrew each terminal a few turns.
Connect the red, positive (+) terminal of the Left loudspeaker to the corresponding red, positive (+) amplifier terminal. Connect the black, negative (-) terminals similarly. Tighten the terminals securely. Repeat this procedure for the Right Channel.

You can connect to either set of terminals.

Ensure the linking straps are in place and that all terminals are tightened down.





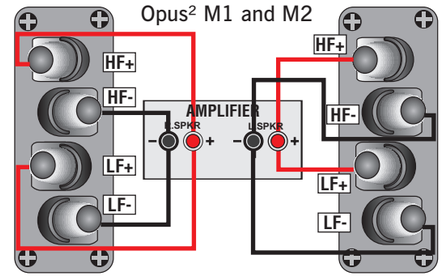
Bi- Wiring

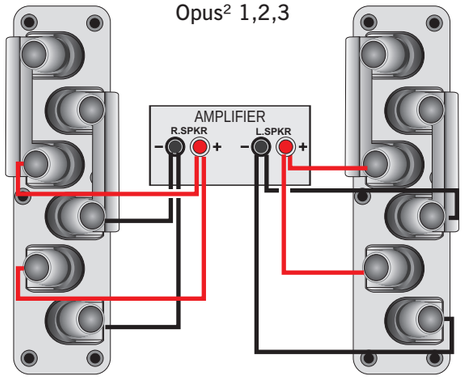
Using separate cables for treble, and bass units in a Bi-wiring configuration reduces intermodulation effects and improves headroom and clarity.
To Bi-wire, you will need to install two lengths of twin core cable between the amplifier and each loudspeaker.

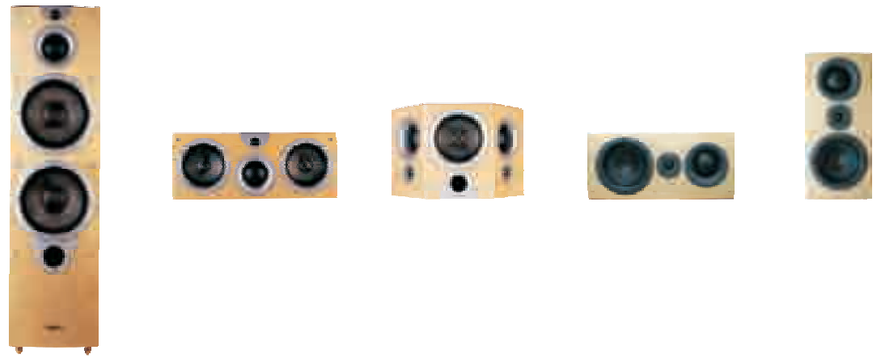
Note: Some amplifiers have two pairs of output terminals to facilitate bi-wiring but this is not essential. The advantages of bi-wiring are fully retained if your amplifier has only one pair of loudspeaker terminals per channel (as in the illustrations).

Opus² M1 and M2:
Remove the bi- wiring straps from each pair of terminals.

Opus² 1,2,3:
Unscrew each terminal a few turns and remove the metal tri-link straps. Use the bi-link straps (supplied in accessories) to connect the treble and mid-range terminals. Connect the cables between the amplifier and the loudspeakers as indicated and re-tighten all terminals securely.







Opus² - 3	Opus² - Tri-Centre	Opus² - Tri-Surround	Opus² - AvC	Opus² - AvS
Four	Four	Five	Three	Three
250mm x 2	170 mm x 2	170 mm	170mm	170mm
3" 75 mm textile	3" 75 mm textile	3" 75 mm x 2 textile	3" 75 mm textile	3" 75 mm textile
1" 25 mm textile	1" 25 mm textile	1" 25 mm x 2 textile	1" 25 mm textile	1" 25 mm textile
6 ohm	6 ohm	6 ohm	6 ohm	6 ohm
4.0 - 34	4.5 - 24	4.0 - 12	4.0 - 18	4.0 - 18
33 Hz - 43 kHz	75 Hz - 43 kHz	60 hz - 43 khz	45 Hz - 43 kHz	45 Hz - 43 kHz
27 Hz	70 Hz	50 hz	40 Hz	40 Hz
45 kHz	45 kHz	45 khz	45 kHz	45 kHz
400 mm	100 - 400 mm	0 mm	0 mm	0 mm
91 db	89 db	89 db	88 db	88 db
>3%	20-200 >5%	>3%	>3%	>3%
>1%	200-45k >1%	>1%	>1%	>1%
300 W	200 W	100 W	100 W	100 W
100 - 600 W	70 - 400 W	40 - 200 W	40 - 200 W	40 - 200 W
116 db	113 db	110 db	108 db	108 db
90° to 14 kHz	80° to 12 kHz	180° to 10 kHz	90° to 14 kHz	90° to 14 kHz
70° to 12 kHz	30° to 12 kHz	90° to 12 kHz	70°' to 14 kHz	70°' to 14 kHz
ported / sealed	sealed	ported	sealed	sealed
51 / 22 L	25 L	12 L	9 L	9 L
30 Hz	60 Hz	60 Hz	70 Hz	70 Hz
650 Hz, 3 kHz	900 Hz, 4 kHz	700 Hz, 3.5 kHz	700 Hz, 4 kHz	700 Hz, 4 kHz
18 & 34 mm MDF	15 & 25 mm MDF	15 mm MDF	15 mm MDF	15 mm MDF
025123	17171	17170	17172	17172
025122				
0775	0776	0775	0775	0775
0368	0373	0375	0374	0374
1210 X 315 X 440	242 X 575 X 320	280 X 460 X 180	230 X 500 X 140	500 X 230 X 140
40.0 kg	14.7 kg	10.6 kg	9.0 kg	9.0 kg

Opus² Specifications

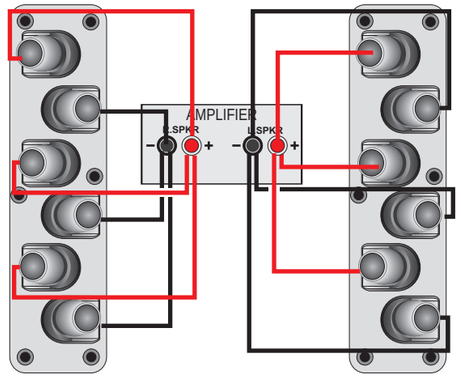
Parameter	Opus² - M1	Opus² - M2	Opus² - 1	Opus² - 2
Transducer complement	Three	Three	Three	Four
Bass Driver Cone	170mm	200mm	200 mm	200mm x 2
Soft Dome Mid-range	3" 75mm textile	3" 75mm textile	3" 75 mm textile	3" 75 mm textile
Soft Dome Tweeter	1" 25mm textile	1" 25mm textile	1" 25mm textile	1" 25 mm textile
Nominal impedance	6 Ohms	6 Ohms	6 ohm	6 ohm
Impedance variation ohms	4.2 - 28	5.0 - 25	5.0 - 33	4.5 - 34
Frequency Response +/- 3dB	42 Hz - 43 khz	40 Hz - 43 kHz	37hz - 43 khz	35 Hz - 43 kHz
LF limit -10 dB	38 Hz	36 Hz	28 hz	28 Hz
HF limit - 10 dB	45 kHz	45 kHz	45 Khz	45 kHz
Rec.rear to wall off- set	300 mm	200 mm	300 mm	100 mm
SPL (1w @ 1m)	87db	88db	89 db	90 db
Distortion 20 – 600Hz 100dB @1m	>3%	>3%	>3%	>3%
600 - 50KHz	>1%	>1%	>1%	>1%
Power Handling				
Continuous Programme	75 W	100 W	150 W	250 W
Recommended Amplifier Power	40 - 150 watts	50 - 200 watts	60 - 300 w	100 - 500 w
Max Peak SPL	106 db	108 db	109 db	115 db
Horizontal Coverage (nom.)	90' to 14kHz	90' to 14 kHz	90' to 14khz	90' to 14 kHz
Vertical Coverage (nom.)	70' to 12 kHz	70' to 12 kHz	70' to 12khz	70' to 12 kHz
Enclosure type: Bass/Mid	Ported	Ported	Ported / Sealed	Ported / Sealed
Volume: Bass / Mid	18 L	27 L	33 L / 10 L	30 / 14 L
System Fb	40 Hz	40 Hz	35 Hz	30 HZ
Crossover Frequencies	650 Hz , 3 kHz	700 Hz , 3 kHz	650 Hz , 3 kHz	650 Hz , 3 kHz
Construction Material	15 & 30 mm MDF	18 & 33 mm MDF	18 & 33 mm MDF	18 & 33 mm MDF
Finishes	Selected wood veneers in high gloss piano lacquer: Birds Eye Maple; Rosewood; Cherry; Black			
Component Part Numbers				
Bass	17172	20164	20159	02162
Bass / Mid				02160
Midrange Dome	0775	0775	0775	0775
Tweeter	0374	0373	0373	0368
Product Dimensions (Overall)	510 X 230 X 360	505 X 255 X 450	1005 X 260 X 410	1140 X 260 X 410
Nett Weight	12.0 kg	16.4 kg	28.0 kg	34.5 kg

Connecting Stereo Loudspeakers -2

Tri-Wiring - Opus 1, 2, 3

The advantages of bi-wiring can be extended by tri-wiring. Here each drive unit is separately connected to the amplifier for the utmost fidelity. The advantages of tri-wiring can be fully realised by optimising the type of cable used to connect the drive units. Your Opus dealer will be pleased to assist you to make the correct choice.

Unscrew each terminal a few turns and remove the metal tri-link straps. Connect the cables between the amplifier and the loudspeakers as indicated and re-tighten all terminals securely.



Bi- and Tri- Amping

Using separate amplifiers for treble, mid and bass units further improves performance by ensuring that each loudspeaker is separately driven - operating each drive unit with its individual amplifier means that each amplifier channel sees a narrower frequency range. This both maximises signal delivery and reduces distortion artefacts to negligible proportions. Although all the amplifiers on one channel need not have the same power output, the amplifiers must be phase coherent and have identical voltage gains. The amplifier setup used must obviously be identical to both channels.

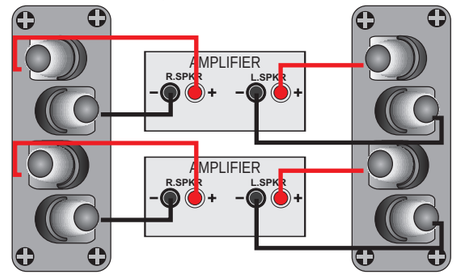
Opus² 1,2,3:

You can tri-amp the loudspeakers, or use two amplifiers with one amplifier connected to the bass channel, and the other connected to midrange and treble terminals in a bi-wiring configuration.

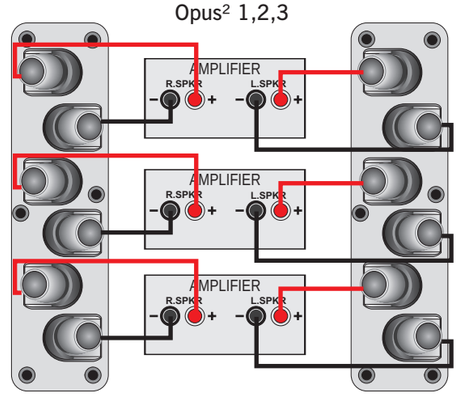
IMPORTANT!

If you are considering multi-amping, unless you know exactly what you are doing it is essential that you seek the advice of your Opus dealer before proceeding further.

Opus² M1 and M2



Opus² 1,2,3



Positioning AV Speakers

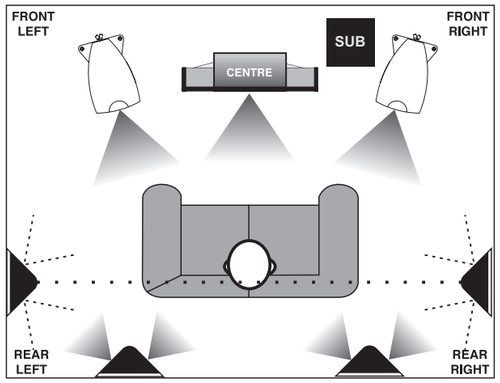
Front Loudspeakers: The front loudspeakers are placed on either side of the TV monitor, 2 to 3 metres apart and somewhat above the listener. The speakers should be angled slightly so they are aimed towards the listeners.

Rear Surround channels: The reproduced sound should be as room filling as possible. We recommend placing the speakers in a high position, behind the listeners head. If the rear wall is more than 1 metre behind the listening seat, an alternative position is on the side walls. If the walls are a long way from the listening seat, consider stand mounting the loudspeakers.

Centre Channel: Most of the dialogue comes from the centre loudspeaker. Speech should appear to originate from the actors mouths. Operating height is important. Ideally the front and centre channel speakers should be at the same height. The front of the cabinet should be level with the TV screen.

The Opus² Tri-Centre loudspeaker may be freestanding or mounted on a stout shelf.

The Opus² Tri-Surround is designed for wall mounting. The unique design of this loudspeaker enables its use either on the rear or the side walls of the room. We suggest that you rear mount these loudspeakers where possible.



The Opus²Av System

The Opus² Av System is a three speaker system. The system comprises a pair of AvS Satellite loudspeakers and a single AvC Centre channel loudspeaker. Both loudspeakers are three-way units.

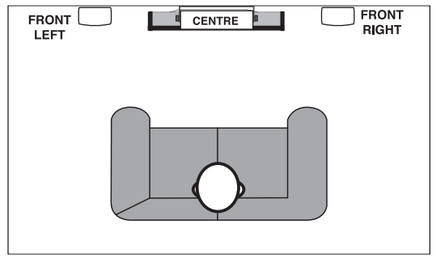
The loudspeakers are designed for wall mounting - integral keyhole slots are provided and, for additional safety, a security fixing kit is included with each loudspeaker.

The Opus² AvC may be wall mounted on its integral keyhole slots, or on a special mounting bracket. When mounted on its bracket the speaker may be angled vertically for optimum effect. The bracket mount is shown in the illustrations.

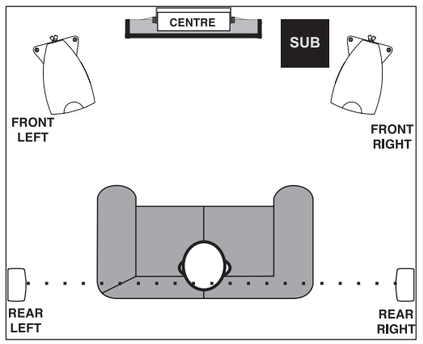
The loudspeakers' small front to back profile makes them ideal as partnering speakers for Plasma or LCD screens.

The Opus² Av system may be used together with an Opus² Subwoofer to add full 5.1 connectivity to a conventional Stereo system - their 3-way design and voicing making an ideal surround sound complement to regular Opus² loudspeakers.

2 Channel System with Centre Channel Re-inforcement



5.1 System



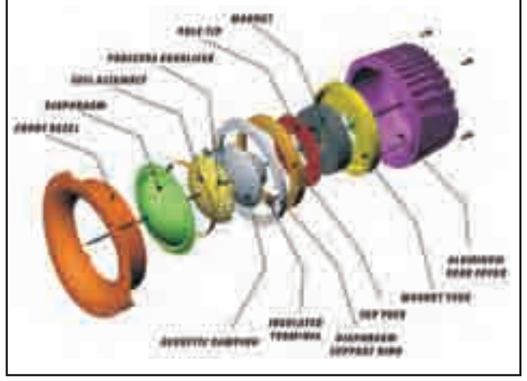
The Opus² Drive Units-2

The 75 mm Soft Dome Midrange Unit

A new studio monitor quality large dome mid-range drive unit is used over the crucial midband frequencies, 700 Hz – 4 kHz. A key feature of this driver is exceptionally low distortion over its entire working range - typically less than 1% at a Sound Pressure Level of 100 db at 1 metre. The driver is mounted in a custom matched fascia plate which provides partial horn loading, giving a broad angle of dispersion at its upper crossover point. The fascia plate is die cast aluminium, designed to place the units as close as possible for optimum integration and to create a point source effect.

The dome is driven by a large 75 mm voice coil based on a hard aluminium former to provide maximum rigidity and to maintain a cool coil operating temperature by maximising thermal radiation. The diaphragm supporting ring is die cast aluminium to maintain perfect concentricity of the moving parts during assembly. The dome is pressure equalised by a closely coupled underside perforated dome baffle and a rear chamber within an extended die cast aluminium finned rear cover which serves as a heat sink and breaks up internal cabinet resonances. A powerful high flux shielded magnet provides ample reserves of motor force to the dome.

Anatomy of a Midrange Dome



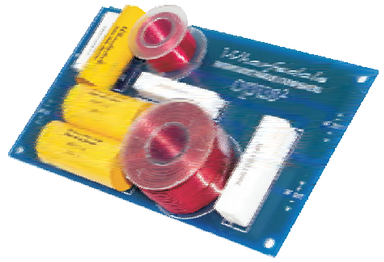
25 mm Soft Dome Tweeter

The highest frequencies are handled by a soft dome driver. Extensive research at Wharfedale has established that properly engineered soft domes are a better choice than metallic based domes which add their own typical character to the treble response.

The new Opus² tweeter has been re-engineered with a specially fine gauge aluminium coil to reduce the moving mass and extend response to beyond 45 kHz -far above audible frequencies. Careful attention to detail has resulted in wide dispersion with very low distortion again typically below 1% at an SPL of 100 db at 1 metre. The unit uses a fully shielded high flux neodymium magnet, and produces a typical SPL of 93 dB at 1 metre at an input of one Watt. Die cast aluminium structural parts are used throughout and a rear cover isolates the tweeter dome from the pressure of other speaker components.

Crossover and Internal Wiring

All models feature printed circuit boards with large copper tracks to maximize signal transfer and component layouts designed to eliminate inference from any residual stray magnetic fields. The printed circuit boards are mounted on vibration free mountings. Most models have two printed circuit boards to separate the bass inductors from those coupling the midrange and tweeter units. The bass inductor has a large magnetic field when operating which would otherwise modulate the other inductors. All inductors feature perfect layer winding and large gauges of wire are used to keep insertion loss to a minimum. Capacitors in crossover networks pose special problems. The Opus² range features high grade low-loss, low-ecr, polypropylene or reversible electrolytic capacitors specially selected for their outstanding audio properties. These capacitors are marked with the 'Wharfedale super audio capacitor' logo. The internal cables used are specially made and assembled in our factory: 4 multiple strand oxygen-free copper wires are plaited into a single cable for all connection runs within the speaker.



The Opus² Drive Units

Bass Drivers

Opus ² bass units are of two main types.

The smallest cabinets use a triple laminated cone of glass /carbon/ glass . Smaller cabinets intensify reflections that can pass back through the cone. The special “tri-lam” construction minimises these reflections because of its extreme rigidity - the small increase in cone mass being more than offset by the performance improvements.

The larger cabinets use larger drivers and here low cone mass is of crucial importance im maintaining impulse response and performance.

Our latest cone designs for the large format models utilise our own bi-carbon weave and laminating processes. Carbon fibre has immense longitudinal strength and is used in many structures where high strength and light weight are key requisites examples of structures using carbon fibre include Formula 1 racing cars, aeroplanes and spacecraft. The carbon fibre bundles are woven and impregnated with special bonding resins that are subsequently pressure formed and heat cured. The resulting material is exceptionally rigid and exhibits very low levels of internal resonance. As a consequence, energy losses in the cone transfer mechanism are very low.

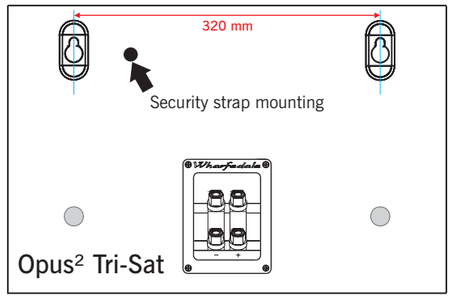
Because our bass drivers are just that, our bass cones maintain true pistonic action over their entire designed low frequency range. The cone is terminated with a conventional large half roll of synthetic butyl rubber with proven damping qualities.

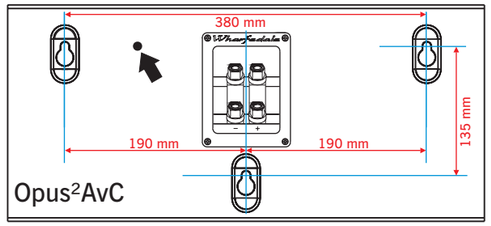
Voice coils in high performance loudspeakers have to withstand extremes of mechanical stress and heat. The lateral strength of Opus² voice coils is very high. We use a combination of half hard aluminium and resin bonded glass fibre. The ability of our voice coils to resist deformation under extreme stress contributes towards some of the lowest distortion figures ever seen in conventional drivers. The coils are covered with a dust cap of the same material as the cone.

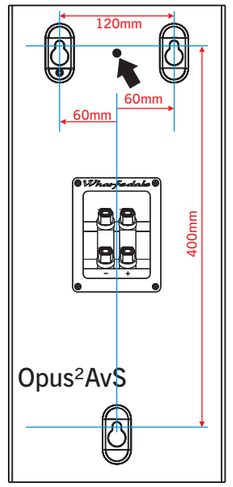
Large, high performance traditional ferrite magnet systems are used throughout. All Opus²large format speakers are fully magnetically shielded with additional bucking magnets and steel covers on the bass driver magnets. You can operate an Opus² speaker close to the most magnetically sensitive TV monitor with no fears over screen interference.

Motional noise can be a problem with high output bass systems. The high pressure injection die cast aluminium chassis used on our bass drivers feature an 'open design' where narrow legs maximise the open areas of the frame to all but eliminate rear reflections. Trapped or compressed air within the driver unit can easily move through vents in the voice coil, through the magnet structure, through the spider, and from the underside of the central cap both through holes in the cone and the magnet central core.

Wall Mounting AV Speakers







The AvC and AvS speakers feature a three point mounting system. Two point mounting is the simpler option and this is the method to use unless you feel you need the security of three point mounting. Ensure the wall is sound, free of obstructions, hidden pipes etc. and capable of supporting the loudspeaker plus a small amount of pulling force. You will also need suitable wall fixings and some 38mm No 8 Round Head screws.

1: Getting started

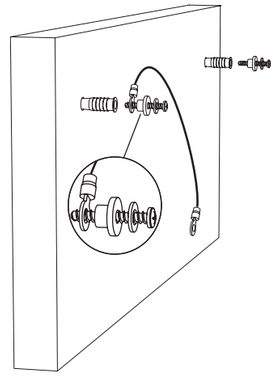
Draw a horizontal line on the wall and mark off the mounting centres of your loudspeaker referring to the top dimension of the drawings.

Drill and plug two holes.

The screw header consists of a plastic spacer and a washer. Thread a washer and a plastic spacer onto each screw. Thread one of the screws through one eyelet of the security strap. Let the security strap hang free.

Screw both header assemblies firmly to the wall.

Do not over tighten the screw. The spacer should rest against the wall and not be driven into the surface.



2: Attaching the loudspeaker

Remove the plastic insert from the security mounting thread between the keyhole slots.

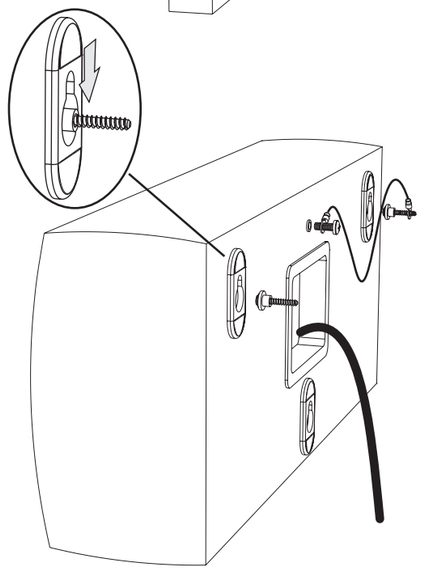
Connect the connecting wire to the loudspeaker but do not connect the cable to the amplifier. You will need to use low profile cable -your dealer will recommend a suitable product.

Lift the loudspeaker up to the mounting position. With the screw, attach the security strap to the loudspeaker security mounting.

Align the keyhole slots over the screw headers and gently pull down until the speaker is securely fastened. You may now connect the loudspeaker to the amplifier.

On the Av speakers, ensure the connecting cable does not foul the lower keyhole slot.

This operation may need two people. If you are in any doubt about your ability to carry out this procedure, consult a suitably qualified builder or domestic electrician.



Opus²

Mounting the Opus² AvC Bracket

Using one of the two brackets as a template mark out four horizontal fixing points on the wall.

Invert one bracket, place one bracket over the other and attach the bracket to the wall with three screws.

Thread the fourth screw over one loop of the security strap. Attach firmly to the wall.

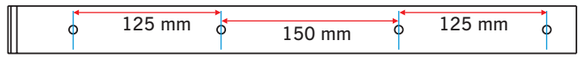
Remove the two screw covers from the sides of the cabinet.

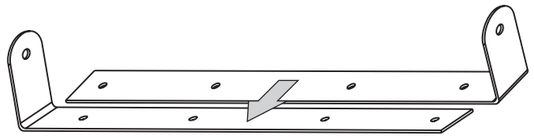
Connect the cable to the loudspeaker but do not attach the cable to the amplifier.

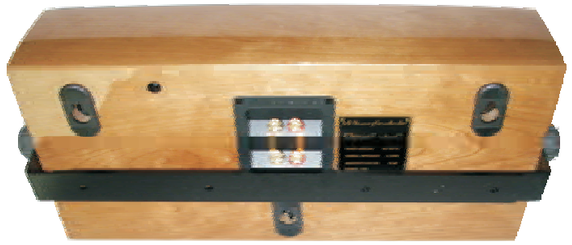
Offer the loudspeaker up to the bracket and attach the security strap to the cabinet with the supplied screw.

Now attach the loudspeaker to the bracket with the two large fixing knobs. You may now connect the loudspeaker cable to the amplifier.

To adjust the vertical angle: Slacken the fixing knobs a quarter of a turn, adjust the angle and re-tighten the loudspeaker.



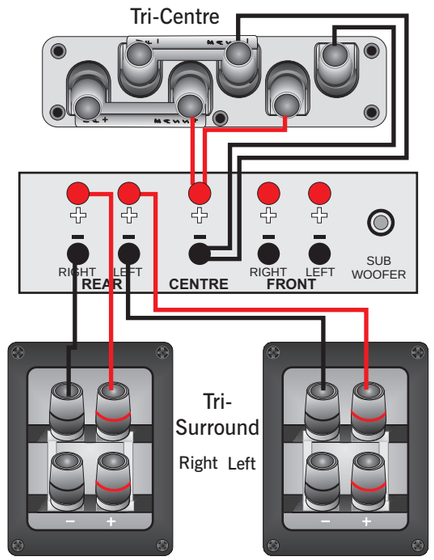




Connecting AV Speakers

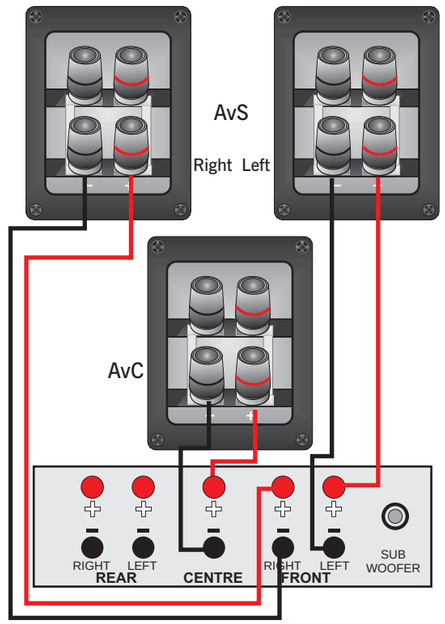
The Tri-Centre may be mono, bi, or tri-wired. Bi-Wiring is perhaps the most popular option.

The Tri-Surrounds may be mono-wired as shown, or in a large installation, bi-wired.



Connecting the Opus² AV System

The system may be mono-wired as shown, or bi-wired.



The Opus² Series

About Your Loudspeakers

The Opus² series of speakers is the latest iteration of the highly acclaimed original Opus range. New models have been introduced to extend the range of applications. These new models together with the latest versions of the award-winning established models address the needs of both the most discerning audiophile and the most avid movie enthusiast.

All the passive speakers in the Opus² range are 3– way loudspeakers - a blend of impeccable performance, phenomenal dynamics and stunning good looks.

Features of the range include:

- Magnetically shielded front loudspeaker models eliminate interference with conventional television sets.
- Very low distortion across the entire audio band
- Low, controlled, excursion of bass and bass-mid drive units.
- High flux magnet systems for good dynamic response to rapid transients
- Wideband dispersion for excellent stereo image and staging
- No beaming, 'lobing' or polar response anomalies in effects loudspeakers.
- Fully integrated design and manufacture – a seamless blend of acoustic performance and design aesthetics.

The Opus² Cabinet

The enclosure of your speaker is a piece of fine furniture.

Real wood veneers are selected and pattern matched by hand before being laid. Over a period of several days a high gloss 'piano' finish is applied. This involves several coatings of lacquer – each layer is laboriously cut and polished before the next coat is applied. Only through this time consuming and skilled technique, can we achieve the deep and lustrous finish which exemplifies the Opus² range.

Every Opus² speaker model has an individually designed curved cabinet which marries utility and form. Conventional parallel sided boxes create acoustic waves within the cabinet – the interaction of these waves creating anomalies in the forward response. The complex curved and braced geometry of Opus² cabinets allied to a dense, acoustically inert cabinet material prevents the build up of damaging resonances and results in clear, precise sound, free from cabinet colorations.

About Your Loudspeaker

Opus²

Wharfedale

Opus² Subwoofers

Introduction

Opus² subwoofers are intended for use with very high quality sound reproducing systems in the home. Your subwoofer will probably be used in conjunction with Opus loudspeakers though they will partner any high performance audiophile or home cinema amplification and loudspeakers. There are three subwoofers in the range - all the subwoofers offer the same connection facilities. All the subwoofers are remote controlled for ease of setup and adjustment.

Positioning the subwoofer

Although the unit may be placed almost anywhere in the room, we recommend that it be placed in front of the listener and as central to the listening position as possible. There should be a mains outlet within easy reach. The subwoofer should not be operated within 450mm of a television set as the drive unit magnet may distort the picture. Remember that there should be a line of sight between the listening position and the front of the subwoofer otherwise the handset remote functions will not be operable.
We suggest you initially position the subwoofer about 20cm (8 inches) from the wall. Placing the unit close to the wall will enhance the bass; placing it across the corner of the room will increase the bass further, possibly at the expense of clarity. Do not place the subwoofer close to surfaces or objects that may rattle. The floor under the subwoofer should be sound with no loose floorboards, etc. Experiment with locations and sources before making a final decision.

Installing Batteries in the Handset

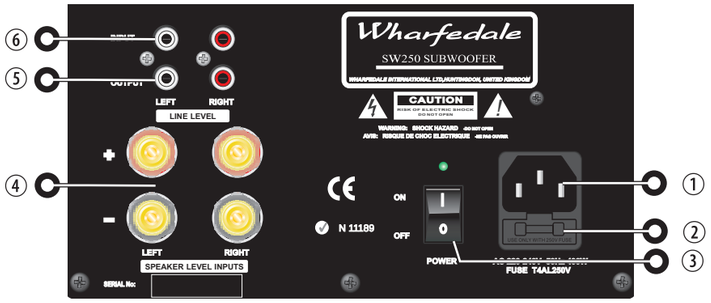
The handset operates on two LR6 (AA) batteries which are supplied. The battery compartment is located at the rear of the handset. Unwrap the batteries and slide the cover off the handset. Place the batteries in the handset observing the polarity. The correct orientation is shown on the diagram. When the batteries are installed, replace the cover.

Before Connecting the Subwoofer

- Switch off your amplifier and all connected source units at the mains.
- Unplug the power cords to all system components if necessary
- Make sure the subwoofer is disconnected from the mains and that the ON/OFF switch is OFF
- Before re-connecting your system to the AC power supply, check that all the connections are properly made
- Check that all speaker terminals are done up tightly.
- Ensure that there are no strands of wire shorting adjacent speaker terminals
- Signal cables should be properly terminated and fully screened to minimise hum. If you connect your subwoofer via the low level signal inputs, the cable between your control unit or processor and the subwoofer could be quite long so screening is particularly important. Consult your dealer if in doubt.

Connecting Your Subwoofer

All Opus² Subwoofers have the same Rear Panel connectivity



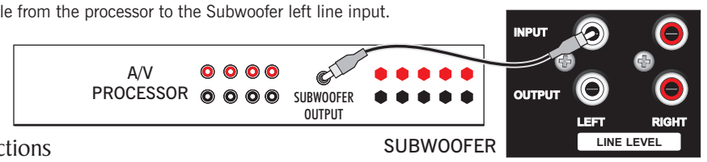
REAR PANEL CONNECTIONS

1. Mains Input
2. Mains Fuse
3. Mains Power Switch
4. Speaker Level Inputs
5. Line Level Outputs
6. Line Level Inputs

Connecting to a Digital AV Processor

If your AV processor has a line level or LFE subwoofer output you should use this connection. You will need to purchase a single screened RCA phono lead from your dealer.

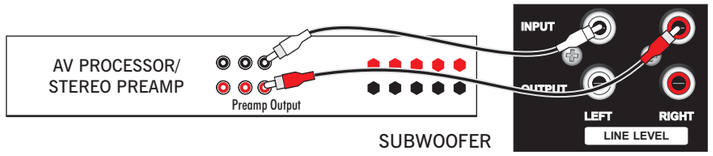
Connect a mono RCA phono cable from the processor to the Subwoofer left line input.



Stereo Line Level Connections

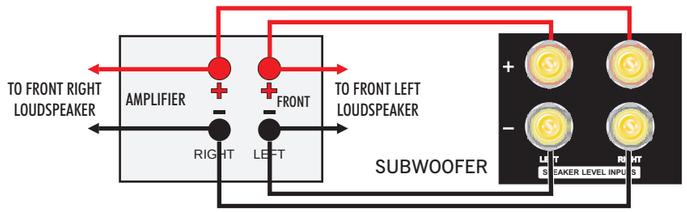
Stereo line level connections will be necessary where where there is no dedicated single subwoofer output, but where there is a separate preamp output, or, if an integrated amplifier, a pre/main link that can be separated.
The output must be controlled by the system volume control - a tape output is unsuitable. If in doubt, consult your dealer.

Connect a stereo RCA phono cable from the line output of the preamp to the Subwoofer line inputs.

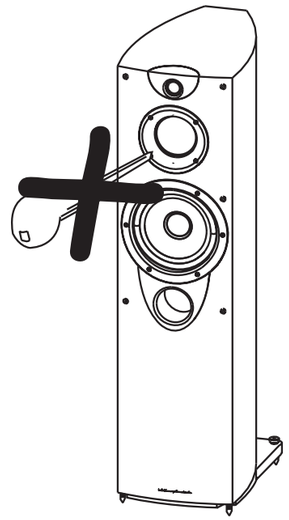


Stereo High (Speaker Level) Connections

The high level Speaker connections should be used only if your amplifier does not have a line level subwoofer output. In this connection the subwoofer is fed together with the Front loudspeakers. For this you will need two extra twin core cables.

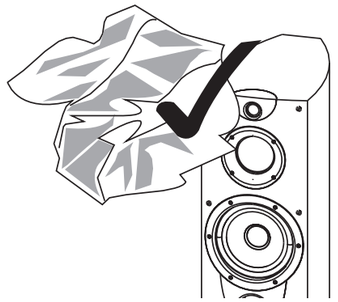


Looking After Your Loudspeaker



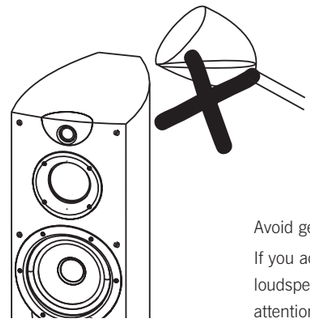
Do not open the speakers; there are no user serviceable parts inside.

Never touch the drive units either with an object or your hands.



Remove marks from the cabinet and polish it with a soft, slightly damp cloth.

Do not apply furniture sprays or solvents - these can spoil the finish.



Avoid getting any liquid behind the grille.

If you accidentally spill liquid on your loudspeakers, take them to your dealer for attention before using them again.

Delay and LFE Settings

The purpose of delay is to enable surround and dialogue information to arrive at the listener's ears at the same time as the Front channels, even when the listening seat is in a non-ideal position.
Rear Delay: If the listening position is equidistant from the Front and Rear speakers, a low delay setting should be set. The closer the listener is to the Rear speakers the higher should be the delay setting used,
Centre Delay: If the Centre speaker is level with (or slightly behind) the Front speakers, set the delay to zero. If the Centre speaker is forward of the Front speakers, increase the delay.

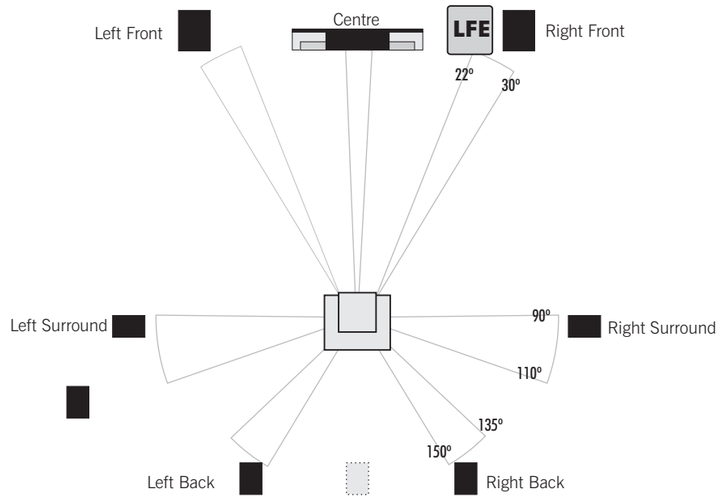
LFE: In domestic systems the LFE channel typically feeds into the subwoofer. Where no subwoofer is used, the LFE signal is combined with Front Channel information. When you set the LFE level at your AV processor, use care as the powerful low frequencies can overload domestic loudspeakers.

If you hear popping or thumping noises coming from the front loudspeakers or subwoofer, immediately turn the AV Processor's volume level down and then back off the LFE level. This should cure the problem. If it does not, back off the volume level at the subwoofer (if you are using one) until the problem disappears.
Please read the relevant sections of your AV amplifier manual and familiarise yourself with the various issues. If you are unsure, consult your dealer for help.

Expanding the System

Dolby Labs, DTS and THX offer 6.1 and 7.1 formats which extend the 5.1 principle by adding one or two extra rear effects channels. Although the precise configuration of these systems will depend on the capabilities of your processor and you should be guided by those instructions, we would make some observations.
For most 6.1 and 7.1 formats, and especially Dolby ES the listening seat should not be too close to the rear wall. Optimising the time delay so that information from all speakers arrives at the listening seat coherently is critical if the benefits of these systems are to be fully realised. THX adjustments in particular need to be followed to the letter.

Dolby Labs Recommended 7.1 Placement
(Single Back channel for 6.1 shown dotted)



Operating Your Subwoofer

Check that all connections to the subwoofer have been properly made and that the main volume control is at minimum. Plug the supplied power cord into the mains socket on the rear panel.

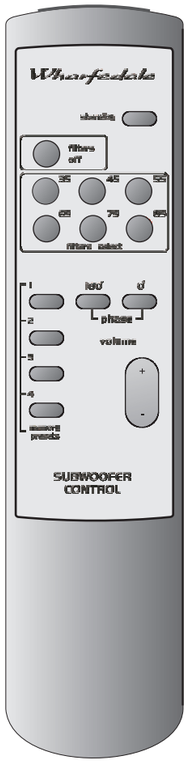
Plug in the mains plug and switch the power on. Now switch the subwoofer on with the rest of your system.

The subwoofer on/off switch has a rocker action; press the upper part to switch the equipment on and the lower part to switch it off. When switched on the light above the power switch will glow and the subwoofer will be operational.

Operation

All control functions are carried out using the remote handset. The handset must be pointed at the subwoofer and be in line of sight for it to operate.

Standby: Operating the Standby key brings the subwoofer in and out of Standby.



The preset light will not light if no preset has been set up or if a preset is over-ridden.

In Standby, the Volume, Filter, Preset and Phase indicators are extinguished. Rear panel lights stay on.

Volume: Press the Volume + key to increase the volume level. Press the Volume - key to decrease the subwoofer volume.

The volume range on the front panel display varies from *00* (minimum) to *99* (maximum).

Low Pass Filters: Pressing the appropriate filter key will select the frequency at which the subwoofer rolls off. The filter has steps at Off and 35Hz-85Hz in 10 Hz increments. When 'OFF' is selected the subwoofer operates over its full designed range. Pressing other keys lowers the maximum operating frequency. The Low Pass Filter value should be chosen having regard to the nature of the Front speakers and programme material. Follow the Setup Notes on Page 11 and the instruction manual of your AV processor (if used) for more guidance.

Phase: This key toggles the subwoofer between 0º and 180º phase shift.

Presets: Four different settings of level, frequency and phase can be stored. Pressing and holding any of the preset keys on the remote for 3 seconds will cause the current settings to be stored in that preset. The display will show the preset number then flash the preset number once to show it has stored the preset. To change from one preset to another: Press a preset key on the remote for less than 3 seconds to recall the settings of that preset. The display will show the preset number.

If you select a preset and then alter any aspect of the setup, the preset light will extinguish (as the setup no longer matches the preset).

Note: When brought out of standby for the first time, the unit will display the factory presets. Thereafter, bringing the unit out of standby will revert it to the operational state last used. If you switch the power on and off at the rear panel while the unit is in standby, the unit will power up to a normal operating state (i.e. not in standby). To enter standby, again press the Standby key.

A Note on the Front Panel indicators. When you bring the unit out of Standby or perform any operation using the handset the front panel lights will indicate the current setup and volume. After 10 seconds the lights will extinguish and the panel will go dark. **This is intentional** and the purpose is to minimise any distraction from the programme in play. The light above the mains power switch on the rear panel will always remain illuminated whenever the subwoofer is switched on at the mains.

Setting Up Your Active Subwoofers

Setting up of the subwoofer should be performed with all tone controls and filters on your amplifier or processor set 'flat'.

Listening rooms are not ideal. Because of room geometry and construction there will be areas with severe peaks at some frequencies and severe troughs at others. If you site loudspeakers in such areas the response will be highly non-linear. It is easier to treat high frequency irregularities by the use of drapes, soft furnishings etc., but very hard to do the same at bass frequencies due to the very long wavelengths - at 40 Hz the wavelength is almost 9 metres.

To help locate standing waves in your listening room, one idea is to sit in the listening seat and recruit a friend with a deep voice to speak as he moves around the area where you propose to site your subwoofer - you will soon find out where *not* to site it! Where the voice sounds most natural is a good place to start.

Although the subwoofer's bass output is enhanced by walls or corners, so often is coloration. As the drive unit faces downward, the floor will influence the sound. The surface under the subwoofer should be stable and unobstructed. If the carpet is very thick, consider placing the subwoofer on a solid surface such as a marble slab. If you place the subwoofer where it amplifies the irregularities of the room or the main speakers the result will be bloated, coloured bass. If acoustic guitar and male voice sounds coloured when the subwoofer is operating and less coloured when in standby, you need to address the positioning first before adjusting any controls.

Loudspeaker Phasing: Make sure that all loudspeaker channels are connected in phase. If there is a doubt about the way the loudspeakers are connected, check their phasing by playing a mono source - the sound should appear from a point midway between the front loudspeakers. If this position is indefinite, reverse the connections to one speaker. Correctly connected loudspeakers give a definite centre sound source with fuller bodied tenor and bass registers.

Setting the Phase of the Subwoofer: Phase at very low frequencies is not straightforward to detect. Initially we suggest you temporarily set the low pass filter to 'off' and the phase to 0º and play some bass heavy music in Stereo through the main speakers and the subwoofer. From the listening position, switch the phase between 0º and 180º. The setting which appears to give the greater bass output is correct. Now follow the instructions below for setting the low pass filter.

Low Pass Filter: If you are using a digital AV processor the initial subwoofer setting should be 'OFF' as the processor will have its own bass management system.

Setting Loudspeaker Sizes: Most digital AV Processors ask you to specify the size of speakers in the various channels. These are usually 'Large' or 'Small'. This sets the bass management for the system. All Opus² regular loudspeakers can be set to 'Large' Smaller loudspeakers (and possibly also the M1) should be set to 'Small' for the Front channels, as the subwoofer will be better at providing clean, deep bass. Choose 'Small' for the surround channels and also for the Centre channel, so that any bass from these channels will be directed to the subwoofer. Set the 'Subwoofer' option on the processor to 'On' or 'Yes'.

After experimenting with various sources you may need to adjust the LPF settings. Try to ensure the subwoofer blends into the sound stage. Setting the subwoofer to Standby should reduce the bass extension, not change the bass level - as always personal taste plays an important part.

Setting levels:

Once the loudspeaker settings have been finalised, put the AV amplifier into its "Test" mode (see instructions supplied with your processor.) Adjust the levels until all channels are reproduced at equal loudness.

When adjusting the subwoofer output level avoid setting too high a level or you will swamp the sound with bass which be tiring to listen to and may limit the subwoofer's ability to respond to large bass transients. Set a sensible level going *into* the subwoofer from the processor. The volume display should be around *50* at normal listening levels.

LFE: This channel was originally an additional bass channel with its own dedicated subwoofer. In practice however, if any speakers are set to 'Small', the LFE channel is combined with the bass from those channels and fed into the subwoofer. When you set the LFE level from your AV processor, use care as the LFE channel contains powerful low frequencies which, although normal in a cinema, may overload a domestic subwoofer. If, during a programme, you hear popping or thumping noises from the subwoofer, turn the AV Processor volume level down and back off the LFE level. If this does not cure the problem, lower the subwoofer volume level.

Setting Up a Home Theatre System

Some of this chapter may appear to repeat the content of the Subwoofer pages - the context however is different.

Placement

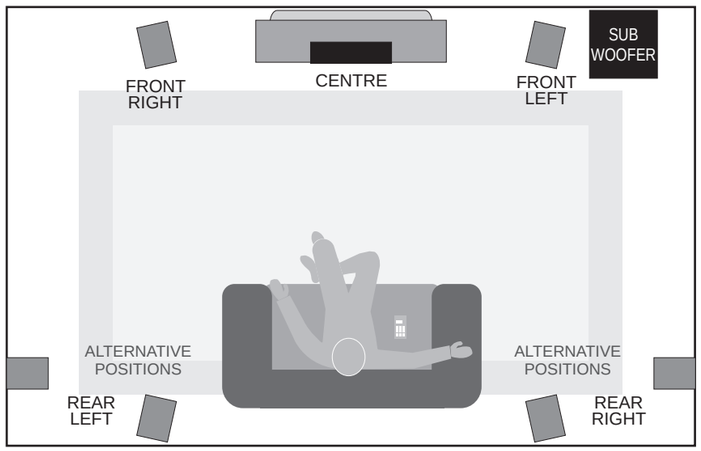
Front And Effects Channels

The front loudspeakers are placed on either side of the television screen, 2 to 3 metres apart. The speakers should be angled slightly so they are aimed towards the listeners.

We recommend placing the rear effects speakers in a high position, behind the listener's head. If the rear or side walls are a long way from the listening seat, consider stand mounting the loudspeakers. If the centre loudspeaker is very high or low, angle it towards the listener's ear level. The front faces of the centre and surround loudspeakers should also be in line as far as possible.

Subwoofer

As the ear is unable to detect the direction from which deep bass originates, this allows you freedom to position the unit. Varying the distance from the wall alters the bass. Placing the subwoofer across a corner boosts the bass but may impair clarity. The performance of Home Theatre systems can often be enhanced by using a pair of subwoofers.



Setting Loudspeaker Sizes

Many digital AV Processors ask you to specify the size of speakers in all channels - usually 'Large' or 'Small'.

The Opus² M2, 1, 2, and 3 may be safely set to 'Large'. The Opus² M1 and Tri-Centre may be set to 'Large' for smaller systems or rooms, or 'Small' for large scale systems. The AvC, AvS and Tri-Surround speakers should be set to 'Small'. As always personal preference will play its part

If you are not using a subwoofer: Set the Front Speakers to 'Large'. Set the 'Subwoofer' option on the processor to 'Off' or 'No'. The Front channels will now receive all the system bass.

If you are using a subwoofer: When set to 'Small' all the system bass will go into the subwoofer. If you choose 'Large' the Front channel bass will be reproduced from the Front speakers.

Once the loudspeaker settings have been finalised, put the AV amplifier into its "Test" mode (see instructions supplied with your processor). Adjust the level of each channel until all channels are reproduced at equal loudness.

You may need to adjust the subwoofer output level. Avoid setting too high a level or you will swamp the sound with bass and may limit the subwoofer's ability to respond to large bass transients. You should also set a sensible level going into the subwoofer from the AV processor.