
Owner's Guide

VIVID AUDIO
USER GUIDE

This manual applies to the following models:
K1, B1, C1, V1.5, and the V series.

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Important Notes

The silver aluminium domed/coned drive units are extremely sensitive. They must never be subjected to probing fingers or other sharp objects! If so, certain damage will result and a replacement driver will have to be fitted.
This replacement will not be performed under guarantee conditions.

Unpacking Instructions

Read these instructions that contain important information about the safe use, installation and maintenance of this loudspeaker.

- Unpack the loudspeaker following the instruction sheet attached to the shipping crate. The method is also described below. Check for damage. Keep potentially hazardous packaging (plastic bags, polystyrene etc.) out of reach of children.

- Dispose of packaging in compliance with current waste disposal requirements.

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Introduction

We're obviously very happy that you chose Vivid Audio Loudspeakers so please spend a little time reading this manual to help ensure that you are equally happy with your purchase.

These loudspeakers are the culmination of many years of research by our design engineer Laurence Dickie and the R&D team in Durban. They feature a range of unique drive units and enclosures which deliver an unprecedented purity of reproduced sound. All our drivers include novel features, many of which have been patented.

A fundamental design philosophy has always been to keep resonances and the effects of reflection well out of band and this applies just as much to our mid-range units as to our tweeters so we don't take a basically floppy cone and treat it until the resonances are acceptable, we make jolly sure they are not there in the first place.

Similarly you may have noticed that the enclosures used in all Vivid Audio products share a very rounded form. This not done for pure aesthetics but is there to completely remove the effects of reflection from the edge of the cabinet.

Having perfected a driver and enclosure combination that deliver totally smooth responses, the crossover designs are quite straightforward with no extra elements required to make up for the deficiencies of the basic acoustic designs.
We follow the conventional rules for system design quite closely and find there is no need to deviate from the path because we do not have to compensate for driver idiosyncrasies.

So having taken all this trouble to develop the loudspeakers we feel it would be only fair that you take the time to read these notes to help squeeze out as much of that performance as possible into your listening space.

Positioning

Vivid Audio loudspeakers are designed with both home theatre and two channel stereo application in mind and, because of the intrinsically shielded magnet structure, all our products can be placed near to conventional tube televisions or computer monitors if necessary.

For two-channel installations we recommend as a starting point that you position the loudspeakers at least 0.5m from the rear wall and, if anything, a little further from the side walls if possible. Hving two different distances here will help to smooth out the effects of the boundaries on the low frequencies and improve the sense of space and scale of the performance.

As a general rule, the closer the speakers are to a wall the more the upper bass will be accentuated. Conversely, if you move them away from the walls only the lower bass will be reinforced. If the walls are of a light construction these reinforcement effects will be reduced accordingly.

Furthermore, all rooms have resonances at a number of single frequencies that will tend to be emphasised when the speakers are placed nearer the corners which can cause 'boominess'. So again, if these are problematic, try moving the speakers away from the corners.

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Remember that all the rules which apply to the loudspeaker position also apply to the listening position so if you find that the low frequencies are a little light because you have placed your sofa in the middle of the room to be equidistant from the surround speakers then you may recover some of this low end by moving the speakers back towards the walls. Similarly, if you are in two channel mode with the listening position close to the back wall and you have excessive bass, try moving away from the wall.

One technique for finding the best speaker position which exploits this reciprocity is to place a speaker at the listening position and to move around the room to find places with an even bottom end. Then you can swap the speaker and listener and find the same result. This only works for one speaker at a time and the results with both speakers in position may not be quite as you expect so be prepared to try again.

A good listening position will often be found at the point where the loudspeakers are about 60˚ apart, fig.1. Much closer together than this and the apparent image width will suffer, much wider and you may find a 'hole' in the centre of the image, particularly when seated off to one side.

There is no appreciable beam from any of the Vivid Audio loudspeaker drivers, that is to say; the tonal balance is consistent across a wide angle as opposed to some designs where the high frequencies in particular quickly fall in level as you move away from a point directly in front of the speaker as if they were shining out from a flashlight. It is our experience that, because of the very smooth wide sound field produced by our designs, angling the loudspeakers so that they both face a position just ahead of the listeners can help to widen the useful area where stereo sound may be enjoyed.

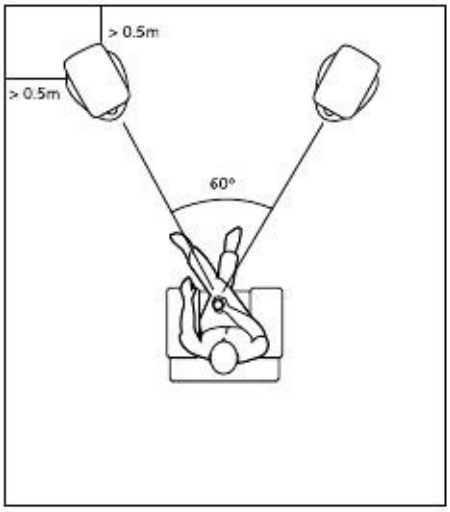

Fig.1

An absence of beaming is also a feature in the vertical plane, so being absolutely at the same level as the loudspeakers is not important. In fact a perfectly enjoyable sound balance may be found when lying on the floor more or less anywhere between the loudspeakers!

Because of the infinite number of combinations of wall materials dimensions and furnishings in the room it is impossible to give more precise positioning advice than that above. In the end we strongly recommend that you experiment, so if you are going to fit the spikes to the bases then we suggest that you leave this until the positions have been determined.

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Small Studio Monitoring

All Vivid Audio speakers make excellent small-scale studio monitors giving pin-point imaging and incredible detail which are both indispensable qualities in such an applications. B1 and K1 are balanced for flat response in a free field acoustic and are thus best suited to very dry acoustics such as heavily damped studios or where the desk and monitors are fairly well removed from the walls. In smaller rooms where the desk is close to the walls, the V1 range or C1 may give a more natural balance.

In either case, you should really measure the response of the system at the listening position and EQ accordingly.

Centre Speaker

With the introduction of a third, central channel, the sound stage tends to fill out in the middle and the two main speakers may be positioned a little further apart, or the listener a little closer, without suffering from holes in the image. If you are positioning the speakers around a TV or monitor, it's worth bearing in mind that the sound stage is best kept in proportion to the size of the picture, so if you have a 35cm screen it might seem a bit disconcerting if the sound stage is as big as a house.

The C1 centre channel model is tonally balanced in such a way that it can be positioned closer to the walls than either B1 or K1. Because of the broad vertical dispersion, even through crossover, it is not too important whether the loudspeaker is sited above or below the screen. If you are using an acoustically transparent screen you can arrange for the tweeter to be at the same height as that of the main speakers.

Surround Speakers

Cinema sound tracks are provided with not just the front three channels but also a variable number of side and rear channels. As these tracks are not really intended to give precise imaging but a more general ambience, it is not so critical that they be accurately positioned.

When using two surround speakers for the 5.1 rear position them at around 60° either side of a point directly to the rear of the listening position, fig.2. With uneven rooms such as L-shapes, aim to have a general symmetry to their locations so the angle of the speakers, as seen from the main listening position, is similar on both left and right. Level differences due to the differing distances can be compensated for during the set-up of the decoder.

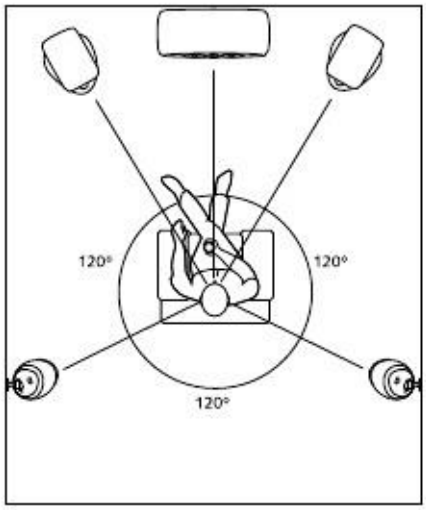

Fig.2

If the speakers are the wall mounted V1w, they should be mounted a good 50cm above ear height, fig. 3, and, while mounting in the very corners of the room is not to be recommended, try to get them as far away as reasonable. Again experiment with the relative position of the seating, the screen and the speakers. You could mount speakers on the back wall facing outward so the main sound is bounced off the side walls to give a greater feeling of space.

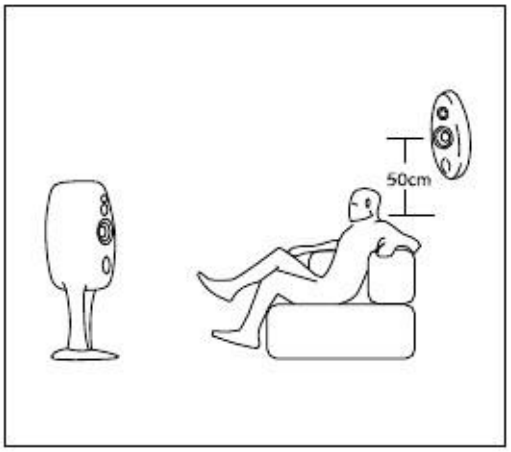

Fig.3

With 6.1 and 7.1 installations, the side channels should be further forward, on a line just behind the seating or around 80˚ either side of a point directly to the rear of the listening position. A 6.1 system has a single rear speaker which should be directly behind the listeners while a 7.1 system uses two rear speakers which should be placed around 25˚ either side of the rear centre point, fig.4..

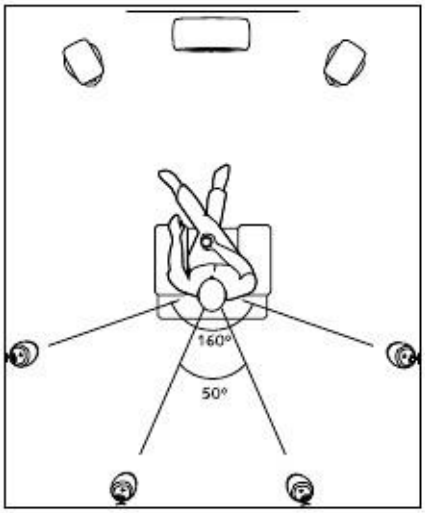

Fig.4

Installing V1 wall mount

V1w is designed for wall mounting through the use of a de-mountable ball and socket arrangement. A hemispherical cage with cruciform cut-out is fitted to the enclosure while the corresponding skeletal ball is fitted to a stem which can be threaded directly onto an M8 wall anchor into a masonry wall, or bolted to a wall plate which should be screwed to stud or timber walls using appropriate fixings.

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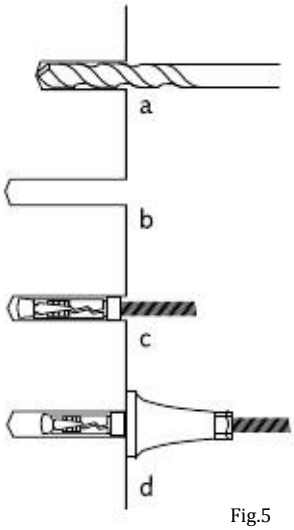

Fig.5

In the case of a masonry wall (fig. 5), first drill a 13mm hole to the depth of 60mm using a suitable carbide tipped drill bit. Insert the wall anchor to the full depth and hand wind the bracket stem onto the projecting M8 thread. Using a 13mm spanner, tighten the stem until secure. Release the M8 Nylock nut on the end of the stem to free the cross shaped ball and adjust its position a few degrees to the right or left until the cross is square to the vertical. Tighten the lock nut.

With hollow walls you will need to use the wall plate. First mark the wall using the plate as a guide and drill the appropriate holes. Then bolt the stem to the plate using the M8 countersunk bolt. The assembly can then be fixed to the wall with a pair of expanding or toggle bolts or, if fixing into the wooden studs, a pair of 5mm countersunk woodscrews. Then align the cross–shaped ball to the vertical as before. Now you can attach the loudspeaker.

Fig.6

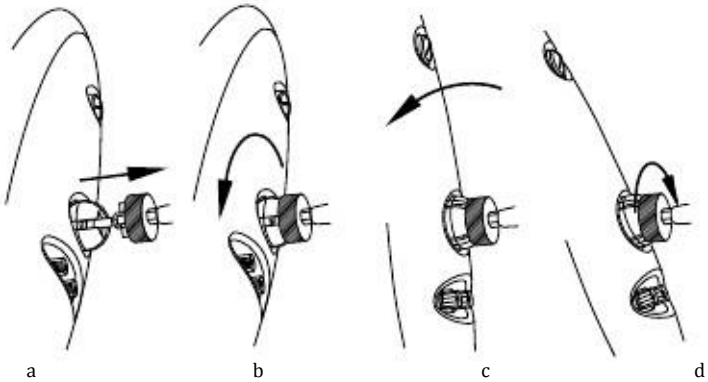

Fig.7

Facing the wall, turn the large knurled nut clockwise until it is right the way back against the end of the stem. Hold the loudspeaker at 45 degrees to the vertical (fig.6) and offer up the cruciform hole in the socket to the corresponding cross on the end of the stem and slide into place (fig.7a). Rotate the speaker until it is vertical (fig.7b) then adjust the overall position to suit, fig.7c. The knurled nut should then be tightened to lock the speaker into position, fig.7d.

Cabling and connections

We recommend that you make and secure all connections before turning on any power to avoid short-circuiting the amplifiers.

In order to discourage folks from trying to stick speaker wires into mains outlets the use of 4mm plugs is not encouraged which is a shame really because they tend to be the most convenient. To this end the holes in the WBT connectors have small rubber bungs fitted to make their use awkward but these can be removed.

To the sides of the WBT terminals are rectangular apertures into which you may insert spade connectors. Vivid Audio speakers are supplied with these angled to the opposite sides in the left and right speakers. This is just to help get the wires pointing in the right direction but just use whichever suits your installation.

We don't try to recommend any particular cable because it is an ever-changing field but we would advise that you get something reasonably thick, say 2.5 mm^2 for less than 10m lengths and 4 mm for up to 20m.

K1, B1, C1 and V1.5 are provided with four terminals to permit the use of bi-wiring or bi-amping shown in fig.8. The mid and high frequency crossover is connected to the right hand pair of terminals (as view from the back) and the low frequency to the other allowing the user to have separate wires feeding each section connected to a single amplifier output, in the case of bi-wiring, or two independent amplifiers in the case of bi-amping. This latter case even gives rise to the possibility of mixing different types of amplifier for the two ranges but be careful to match the gain and polarity of the two if you are to avoid messing up the basic frequency response of the loudspeaker. If you are in any doubt about this you really should talk to your dealer.

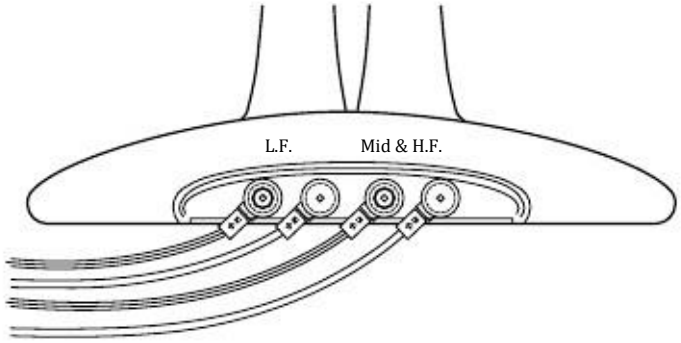

Fig.8

For many folks the use of extra wires will seem quite pointless in which case a single pair of good quality conductors will be all you require and the two pairs of terminals must be linked at the speaker using the links provided. In the accessories pack you will find two 10cm lengths each of red and black wire each terminated with a 4mm plug and spade. Link the hi-mid section to the low section as shown in Fig.10.

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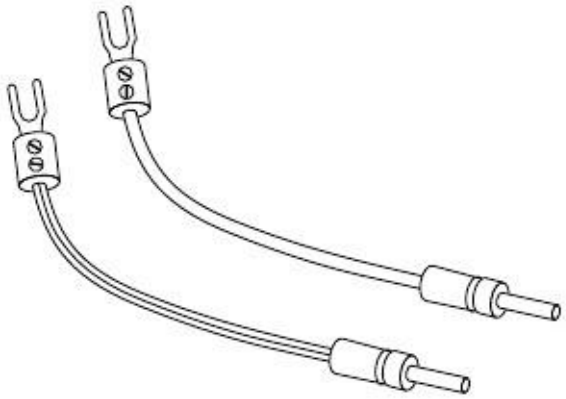

Supplied non bi-wired links. Fig 9.

This arrangement will allow you to use amplifier leads terminated with either spade connectors (as shown) or 4mm plugs.

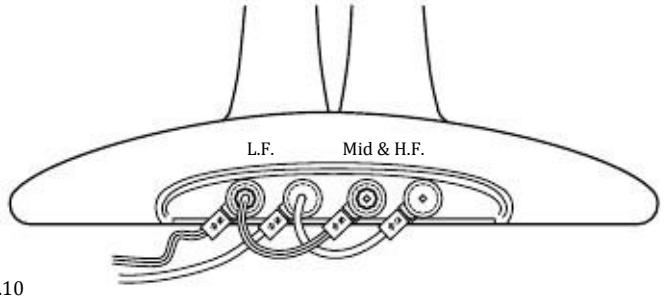

Fig.10

Spikes

One of the innovative design features of certain Vivid Audio designs is the use of reaction cancelling drivers and ports, the purpose of which is to cancel out any reaction forces on the enclosure and hence the dependency of the overall acoustic delivery on the way in which the loudspeaker is supported on the ground. Nevertheless we do provide five M8 threaded holes in the bottom surface of the base and five corresponding spikes to fit into these points if required for stability on soft carpets. Some have also reported sonic benefits as a result.

We recommend that you have two fairly strong people available for this operation particularly for our larger models. First lie the cabinet down on its side on a soft towel and screw the five spikes all the way into their holes. Next, unscrew the two rear and single front spike by two or thee turns and stand the speaker up. Ensure that the speaker is vertical as seen from the front. Adjust the two rear spikes accordingly if not. From the side you will have to verify that the base is horizontal since some of the models have a slightly angled baffle. Don't worry too much about this since it is purely a visual issue so if it looks OK leave it there. If it needs a tweak then use the front spike to make that adjustment. Once aligned tighten the lock nuts on these three spikes. Then unscrew the two side spikes by hand until they touch the ground, at which point it will become difficult to turn them further. Tighten the two corresponding lock nuts and the operation is complete. Only hand tighten these spikes - DO NOT USE A WRENCH.

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Running in

It is now fairly well accepted that, despite the protestations of the engineering teams who design loudspeakers and who have difficulty accounting for it, there is a definite period of time during which the sound of the equipment improves subtly. There are definite and measurable changes which occur, particularly for the compliant suspensions, as the various materials used soften up and gradually approach their design values but it really does seem that some other improvements occur.
Some well respected authorities have even referred to it as a 'learning' phase.

There is also the far more earthly explanation that what is happening is that our brain/ear combination is becoming accustomed to the new sound balance from the loudspeakers. Certainly, the great clarity delivered by the Vivid Audio approach can be a little disconcerting at first if you have been used to the sound of mid-range cone break-up and the first reaction is that something is missing. Bit by bit you realise that something is missing and you are really hearing through to the original recording in a way that you never experienced before. This can in itself be rather revealing of poorly edited work but then the original recording engineers may not have had the benefit of monitoring on Vivid Audio loudspeakers so give them a break!

It is not really for us to get involved here with the philosophy or metaphysics of what might be happening but suffice to say that you shouldn't be too surprised if, after owning you speakers for a few weeks, you really get very excited about what you're hearing.

Important

- The manufacturer warrants that these loudspeakers supplied will at the time of delivery correspond to the description given by the manufacturer.
- The manufacturer declines all responsibility for damage resulting from improper, incorrect or negligent use.
- Repairs must only be carried out by a service centre authorised by the manufacturer.
- All other warranties, conditions or terms relating to fitness for purpose, quality or condition of the Goods, whether express or implied by statute or common law or otherwise are excluded to the fullest extent.

VIVID audio

K1

K1 SPECIFICATION

Configuration :
3 & 1/2 way vented cabinet
Cabinet material :
Complex loaded carbon fibre filled polymer

Finish :
High gloss automotive
Drive units :

26mm metal dome hf unit
50mm metal dome mf unit
158mm metal coned lf unit (two pairs coupled)
Sensitivity :

89dB/1w @1m
Nominal Impedance ( ):
6

Frequency range (hz) :
- 6dB points 35 – 44,000
Frequency response (hz) :
39 – 41,000 +/- 2dB on reference axis

Harmonic distortion (2nd and 3rd harmonics) :
< .0.5% over frequency range
Cross over frequencies (hz) :
100, 900, 4000

Power handling (music program) watts rms :
600
Loudspeaker dimensions (H, W, D cabinet, D base) mm :

1300, 280, 450, 488
Net mass (kg) :
56
Shipping dimensions (H, W, D) mm :

1420, 450, 560
Shipping mass (kg) :
70

VIVID audio

B1

B1 SPECIFICATION

Configuration :
3 & 1/2 way vented cabinet
Cabinet material :

Complex loaded carbon fibre filled polymer
Finish :
High gloss automotive
Drive units :

26mm metal dome hf unit
50mm metal dome mf unit
158mm metal coned lf unit (two of coupled)
Sensitivity :

89dB/1w @1m
Nominal Impedance (
4):

Frequency range (hz) :
- 6dB points 35 – 44,000
Frequency response (hz) :
39 – 41,000 +/- 2dB on reference axis

Harmonic distortion (2nd and 3rd harmonics) :
< .0.5% over frequency range
Cross over frequencies (hz) :
100, 900, 4000

Power handling (music program) watts rms :
300
Loudspeaker dimensions (H, W, D cabinet, D base) mm :

1095, 265, 375, 420
Net mass (kg) :
38
Shipping dimensions (H, W, D) mm :

1220, 410, 510
Shipping mass (kg) :

50

VIVID audio

C1

C1 SPECIFICATION

Configuration :

3 way vented cabinet
Cabinet material :
Complex loaded carbon fibre filled polymer
Finish :

High gloss automotive
Drive units :
26mm metal dome hf unit
50mm metal dome mf unit

158mm metal coned lf unit (two of)
Sensitivity :
90dB/1w @1m

Nominal Impedance ( ) :
8
Frequency range (hz) :
- 6dB points 35 – 44,000

Frequency response (hz) :
39 – 41,000 +/- 2dB on reference axis
Harmonic distortion (2nd and 3rd harmonics) :
< .0.5% over frequency range

Cross over frequencies (hz) :
100, 900, 4000
Power handling (music program) watts rms :
300

Loudspeaker dimensions (H, W, D cabinet, D base) mm :
268, 755, 330
Net mass (kg) :

23
Shipping dimensions (H, W, D) mm :
370, 945, 450
Shipping mass (kg) :

35

C1 STAND

Material :
Complex loaded carbon fibre filled polymer

Finish :
High gloss automotive
Dimensions (H, W, D) :
440, 535, 380

Net mass (kg) :
13
Shipping dimensions (H, W, D) mm :
350, 448, 292

Shipping mass (kg) :
20

VIVID audio

V1.5

V1.5 SPECIFICATION

Configuration :

2 way vented cabinet
Cabinet material :

Complex loaded carbon fibre filled polymer
Finish :

High gloss automotive

Drive units :

26mm metal dome hf unit

158mm metal coned lf unit
Sensitivity :

89dB/1w @1m
Nominal Impedance ( ):

8

Frequency range (hz) :

- 6dB points 40 - 28,000
Frequency response (hz) :

42 - 24,000 +/- 2dB on reference axis
Harmonic distortion (2nd and 3rd harmonics) :

< .0.5% over frequency range

Cross over frequency (hz) :

3000
Power handling (music program) watts rms :

150
Loudspeaker dimensions (H, W, D) mm :

1130, 255, 240

Net mass (kg) :

23
Shipping dimensions (H, W, D) mm :

1300, 430, 460
Shipping mass (kg) :

37 (unit)

VIVID audio

V1

V1s

V1h

V1 s,w & h SPECIFICATION

Configuration :

2 way vented cabinet

Cabinet material :

Complex loaded carbon fibre filled polymer

Finish :

High gloss automotive
Drive units :

26mm metal dome hf unit

158mm metal coned lf unit
Sensitivity :

89dB/1w @1m
Nominal Impedance ( ):

8
Frequency range (hz) :

- 6dB points 42 - 28,000

Frequency response (hz) :

45 - 24,000 +/- 2dB on reference axis
Harmonic distortion (2nd and 3rd harmonics) :

< .0.5% over frequency range
Cross over frequency (hz) :
3000

Power handling (music program) watts rms :
150
Loudspeaker dimensions (H, W, D) mm :

635, 255, 195

Net mass (kg) :

V1s = 17 V1w = 13, V1h = 15
Shipping dimensions per pair (H, W, D) mm :

1420, 450, 560
Shipping mass (kg) :

V1s = 47 (pair), V1w = 39 (pair), V1h = 22 (unit)

The V1w suitable for both dry and masonry type walling. As above without the moulded foot.

VIVID audio

Installation Notes:

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Some loudspeaker history

1874 - Ernst W. Siemens was the first to describe the "dynamic" or moving-coil transducer, with a circular coil of wire in a magnetic field and supported so that it could move axially. He filed his U. S. patent application for a "magneto-electric apparatus" for "obtaining the mechanical movement of an electrical coil from electrical currents transmitted through it" on Jan. 20, 1874, and was granted patent No. 149,797 Apr. 14, 1874. However, he did not use his device for audible transmission, as did Alexander G. Bell who patented the telephone in 1876. After Bell's patent was granted, Siemens applied for German patent No. 2355, filed Dec. 14, 1877, for a nonmagnetic parchment diaphragm as the sound radiator of a moving-coil transducer. The diaphragm could take the form of a cone, with an exponentially flaring "morning glory" trumpet form. This is the first patent for the loudspeaker horn that would be used on most phonographs players in the acoustic era. His German patent was granted July 30, 1878 and his British patent No. 4685 was granted Feb. 1, 1878.

Oliver Lodge
from Das Fotoarchiv

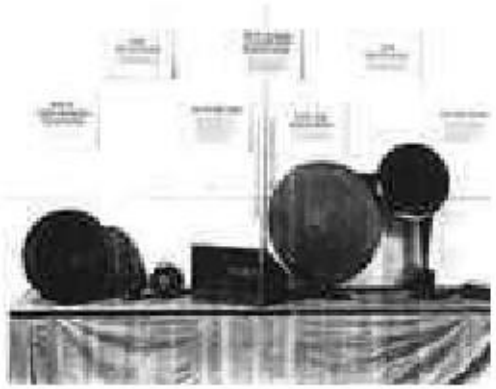
1898 - Oliver Lodge filed for British patent No. 9712 on Apr. 27, 1898, for an improved loudspeaker with nonmagnetic spacers to keep the air gap between the inner and outer poles of a moving coil transducer. This was the same year he applied for a patent on his famous radio tuner. A model of his loudspeaker is in the British Science Museum in South Kensington, and a photo was published in Wireless World Dec. 21, 1927. This improvement was later claimed by Pridham and Jensen in the Magnavox application for patent No. 1,448,279 filed Apr. 28, 1920, and granted Mar. 13, 1923.

1901 - John Stroh first described the conical paper diaphragm that terminated at the rim of the speaker in a section that was flat except for corrugations, filed for the British patent No. 3393 on Feb. 16, 1901, granted Dec. 14, 1901.
1908 - Anton Pollak improved the moving-coil loudspeaker with a voice-coil centering spider, filed for U.S. patent No. 939,625 on Aug. 7, 1908, granted Nov. 9, 1909.
1911 - Edwin S. Pridham and Peter L. Jensen in Napa, California, invented a moving-coil loudspeaker they called the "Magnavox" that was used by Woodrow Wilson in San Diego in 1919.

Early Bell loudspeakers

1915 - Harold Arnold began program at Bell Labs to improve phonographic sound recording. The first priority was the electronic amplifier using the new vacuum tube, second was the microphone, and third was the loudspeaker that would improve the "balanced armature" units developed for public address. After WWI, J. P. Maxfield led this project that produced E. C. Wente's moving coil speaker by 1925, the Orthophonic phonographic player by 1925, and Vitaphone talking motion pictures by 1926.

1918 - Henry Egerton on 1918/01/08 filed patent for balanced-armature loudspeaker, used in the Bell Labs No. 540AW speakers developed by N. H. Ricker Oct. 6, 1922, that became the 540 commercial speaker by 1924; was based on the balanced armature telephone patent of Thomas Watson granted Oct. 24, 1882, similar to devices also developed by Siemens and Frank Capps.



1925 Grebe radio receiver and 1924 Western Electric 540 speaker (NMAH)

1921 - The Phonetron based on patent No. 1,847,935 filed Apr. 23, 1921, by C. L. Farrand, was the first coil-driven direct-radiator loudspeaker to be sold in the U.S. and was well-received, competing with the horns used by table radios

1923 - The Thorophone was a gooseneck loudspeaker with a voice-coil driver

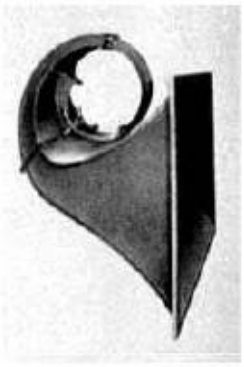
1925 - The research paper of Chester W. Rice and Edward W. Kellogg at General Electric was important in establishing the basic principle of the direct-radiator loudspeaker with a small coil-driven mass-controlled diaphragm in a baffle with a broad midfrequency range of uniform response. Edward Wente at Bell Labs had independently discovered this same principle, filed patent No. 1,812,389 Apr. 1, 1925, granted June 30, 1931. The Rice-Kellogg paper also published an amplifier design that was important in boosting the power transmitted to loudspeakers. In 1926, RCA used this design in the Radiola line of a.c. powered radios.

1925 - Victor Orthophonic acoustic phonograph player had a folded exponential horn that was later used as model for the Klipsch speaker of the hi-fi era. Within a year, the Orthophonic faced competition from all-electric phonographs with an electromechanical pickup, vacuum-tube amplifier, and moving-coil loudspeaker, such as the Brunswick Panatrope sold by the Brunswick-Balke-Collender Company.

Vitaphone 555-W, from AT&T Archives

1926 - Vitaphone sound system for motion pictures used a new speaker developed at Bell Labs. Wente and Thuras designed the Western Electric 555-W speaker driver that was coupled with a horn having a 1-in. throat and a 40-sq. ft. mouth; it was capable of 100-5000 hz freq. range with an efficiency of 25% (compared to 1% today) needed due to low amp power of 10 watts. The power amps were 205-D. Older loudspeakers were balanced armature type, but the newer 555-W speakers of the Vitaphone were moving coil type.

1928 - Herman J. Fanger filed patent No. 1,895,071 on Sep. 25, 1928, granted Jan. 24, 1933, that described what came to be known as the coaxial speaker, composed of a small high frequency horn with its own diaphragm nested inside or in front of a large cone loudspeaker, based on the variable-area principle that made the center cone light and stiff for high frequencies and the outer cone flexible and highly damped for lower frequencies.

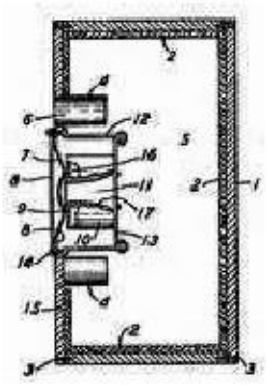


1929 - E. W. Kellogg filed patent No. 1,983,377 on September 17, 1929, granted December 4, 1934, that described an electrostatic speaker composed of many small sections able to radiate sound with out magnets or cones or baffles. This patent, as well as the 1932 British patents of Hans Vogt, influenced Peter Walker to build the Quad ESL flat panel speaker in 1957.

1929 - J. D. Seabert of Westinghouse developed a horn-type loudspeaker that directed the sounds of human speech toward the audience better than cone speakers that were intended for the over-all sound including music to fill the entire . These "directional baffle" horns had an opening 3 ft. by 4 ft. and were different from small-throat horns.

Thuras bass-reflex patent

1930 - Albert L. Thuras filed patent No. 1,869,178 on Aug. 15, 1930, granted July 26, 1932, for the bass-reflex principle while working at Bell Labs. Early cabinets used a passive baffle to direct sound to the front, allowing the back of the cabinet to be open for the low sounds. The bass-reflex enclosure kept the low-frequency sounds from being lost from the rear of the diaphragm.



1931 - Bell Labs developed the two-way loudspeaker, called "divided range" for the demonstration by H. A. Frederick in December of vertically cut records. The high frequencies were reproduced by a small horn with a frequency response of 3000-13,000 hz, and the low frequencies by a 12-inch dynamic cone direct-radiator unit with a frequency response within 5db from 50-10,000 hz. By 1933, a triple-range speaker had been developed for the Constitution Hall demo in April, adding Western Electric No. 555 driver units as the mid-range speaker. For the low frequency range 40-300 hz, a large moving coil-driven cone diaphragm in a large baffle expanding from a 12-in throat to a 60-inch mouth over a total length of 10 ft. This 3-way system was introduced in motion picture s as "Wide Range" reproduction.

1932 - RCA demonstrated a dual-range speaker of its own design for s, using three 6-inch cone diaphragms with aluminium voice coils in divergent directions, with a response of 125-8000 hz, and 10-ft. horns 40-125 hz.

1933 - "Progress was such that a demonstration of the new system - called "stereophonic" because of its ability to give a spatial sense corresponding to stereoscopic vision - was given before the National Academy of Sciences and many invited guests at Constitution Hall, Washington in the spring of 1933. Transmission was

Thuras theatre speaker 1933, from AT&T Archives

over wire lines from the Academy of Music in Philadelphia and three channels were used with microphones respectively at left, centre and right of the orchestra stage and loud speakers in similar positions in Constitution Hall." This transmission of music "was carried out with special loud speakers developed for the purpose by Dr. Wente and the late A. L. Thuras. The objectives in the design of these loudspeakers were uniform response over the whole tonal range of the orchestra, an enhanced sound power output capacity without noticeable non-linear distortion and uniform distribution of the emitted sound at all frequencies throughout a wide solid angle.

VIVID audio

For the receiving unit and the multicellular horn which were developed for this demonstration, Dr. Wente, jointly with the Bell Telephone Laboratories, was awarded a gold plaque by the Academy of Motion Picture Arts and Sciences in 1936." (Bell Labs, 1953)

1935 - Douglas Shearer and John Hilliard at MGM developed a standard speaker system, starting with the Loews 5000-seat Capitol on Broadway. James Lansing and Dr. John F. Blackburn of Cal Tech designed a 2-way speaker system; the high frequency driver had a 3-inch aluminium diaphragm and throat size of 1.4 inches; the low frequency baffled cone unit was 15 inches. ERPI provided speakers from Fletcher's hi-fi experimental equipment to help design the speakers. The low frequency horn used four 15-in. Lansing cone drivers and Lansing 284 drivers for multicell horns of different sizes. The system was installed in 12 s for the opening of "Romeo and Juliet" with Norma Shearer, sister of Douglas,

Aztec A-7 Voice of the , from Audio, Dec. 1961

then installed in all Loews s, then became the standard established by the Academy.

1940 - Paul W. Klipsch filed patent No. 2,310,243 on Feb. 5, 1940, granted Feb. 9, 1943, for the corner horn speaker.

1941 - Altec Lansing Corp. was formed when Altec bought Lansing; Altec Service Corp. (from "all technical") had been formed in 1938 by M. Conroe and George Carrington to manage ERPI installations after ERPI was dissolved. John Hilliard worked at Altec Lansing in 1943 on magnetic airborne sub detection and in 1945 put on the market the 2-way "Voice of the Theater" speaker system with improved horns and magnet drivers. See Lansing Heritage for images and a detailed history.

Avery Fisher with 9-tube amp and coaxial speaker, from Fortune, Oct. 1946

1949 - W. E. Kock and F. K. Harvey at Bell Labs developed the acoustical lens, and reported findings in 1949 JAES. These lenses are used in James B. Lansing theater speakers and home hi-fi speakers

1953 - Arthur Janszen was granted patent No. 2,631,196 on March 10, 1953, for an electrostatic high-frequency speaker

1954 - Acoustic Research introduced the small AR-1 bookshelf loudspeaker that used the acoustic suspension principle developed by company co-founder Edgar Villchur. This was soon followed by the $89 AR-2 and by the AR-3 with improved domed tweeters in 1958.

Walker's ESL, from Quad

1957 - Quad ESL marketed as the first full-range electrostatic loudspeaker, designed by Peter Walker and David Williamson, based on Edward W. Kellogg's patent No. 1,983,377 filed September 17, 1929 and granted December 4, 1934.
1974 - Earthquake premiered Nov. 15 in the Chinese in Hollywood with Universal Picture's Sensurround process developed by W. O. Watson and Richard Stumpf at Universal. Four large low-frequency horns were located behind the screen, two in each corner. The Model W horn in each corner was 8 ft. long, 4 ft. wide, 4 ft. high. The Model C horn in each corner was a modular unit 1 ft. wide and 5 ft. high. Two additional horns were located on a platform in the rear of the . Each horn was driven by a 1000-watt amplifier controlled by inaudible tones on a special optical control track along with the normal 4-track magnetic soundtrack of the 35mm Panavision filmstrip.

1994 Sees the introduction of what was quite possibly the world's least coloured loudspeaker system – the Nautilus. Conceived and designed by Laurence Dickie the loudspeaker has been highly acclaimed for over a decade and has a pride of place in the Millennium Dome in London. Ten years later Laurence had honed these technologies from Nautilus to new heights for a range of products from Vivid Audio, to similar levels of acclaim and excitement from the world's specialist press.

VIVID audio

To quote from Laurence's Vivid Audio Ethos "Through aeons of evolution, the hearing of animals like ourselves has developed an incredibly high sensitivity to resonance and reflection as a matter of survival. Much crucial information can be deduced about the surrounding environment and the presence of imminent danger by listening for subtle changes in these effects.

At Vivid Audio, we believe that the subjective transparency of a loudspeaker system is closely related the reduction of these two aberrations and have made every effort to keep them to a minimum.

Each driver is designed to be pistonic within their working bandwidth with resonant break-up occurring well above the range of audibility or at a frequency at least five times that of the upper band limit. At the rear of the diaphragm, any cavities which might lead to in-band resonances have been comprehensively vented or coupled to matched absorbers, both actions which completely remove them.

Reflected energy from the rearward wave-front is also controlled by minimising the area of any obstruction, such as the struts of the low frequency driver chassis or the dome driver pole pieces, and ensuring that the wave then passes through an adequate volume of absorbent material before meeting any boundaries.

A similar attention to detail is applied to the external surface which dictates that it be free of any sharp features which might give rise to distinct reflections. The gently swept spline curve, which defines the cabinet shape, ensures that the emerging wave-front encounters no perturbation. All aspects of the enclosure design were created using solid modelling to produce the seamless curves and precision features. Such a smooth form and compact enclosure results in an extremely wide mid-band dispersion which gradually narrows with ascending frequency. This natural sounding polar performance integrates with a wide variety of listening environments to give a gently falling power response which quality is widely acclaimed as being highly desirable. Having a well-controlled off-axis response also widens the usable listening area to include much of the room.

VIVID audio

Radial magnet technology permits the mounting of drivers with a minimal separation ensuring the widest vertical beam at crossover while also having an intrinsically low stray magnetic field which allows placement close to CRT monitors.
Having such a flowing line, the natural choice of enclosure material is a moulded polymer. We selected a synthetic resin filled with a blend of graded mineral particles and medium length carbon fibres. The moulds were cast from patterns cut from solid using multi-axis mills driven directly from the 3D models created in the design process.
The doubly curved form of the cabinet walls possesses a high degree of intrinsic rigidity further enhanced by moulded lateral bracing which two factors ensure that the resonant modes are sufficiently high in frequency. Direct mechanical excitation of the enclosure is, in any case, avoided by rigorous use of compliant mounts for every driver and reaction cancelling between the two low frequency drivers which ensures that there is no net movement of the chassis below 100Hz. Reaction cancelling is further applied to the design of the low frequency venting where a pair of ovoid ports, with streamlined profile to minimise air turbulence, are positioned on the front and back of the cabinet. The result is an extremely stable low frequency performance with a rather novel appearance.

* Many of the above technologies are patented and are protected by international law. Perceived infringements will be actively pursued.

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All VIVID AUDIO products are in conformity with the EMC directive and the low voltage directive.

Availability of models may vary from country to country.

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