

Stereo Review

TEST REPORTS

OHM WALSH 4 SPEAKER SYSTEM

HIRSCH-HOUCK LABORATORIES

THE Ohm Walsh 4 is based on an unusual speaker designed by the late Lincoln Walsh. Unlike most hi-fi speakers, the Walsh speaker is essentially a "one-way" system. It has a single full-range conical driver facing down into a large enclosure. The voice coil is at the top (small end) of the cone, and the sound propagates down the outside surface of the cone. The driver consequently produces a phase-coherent, cylindrical wave front.

In its purest form, the Walsh speaker (as used in the Ohm F, for example), is omnidirectional in the horizontal plane and quite dependent on placement for best results. It is also a low-sensitivity speaker.

For the Ohm Walsh 4, which has a recommended amplifier power range of 50 to 500 watts, the Ohm engineers modified the Walsh design by placing a sound-absorbing material called Tufflex around the top rear of the main cone.

This serves to attenuate the middle- and high-

frequency rear-wall reflections, which improves imaging and allows for less critical placement. In addition, the highest frequencies are augmented by the direct radiation of a small auxiliary supertweeter above the main cone, which is aimed 45 degrees inward from the system's front axis in order to provide the desired room coverage. The lowest bass frequencies radi-



Features

- Sub-Bass Activator (a passive equalizer to augment low-bass output, attenuate infrasonic frequencies, and adjust mid-bass sensitivity for proper balance)
- Frequency-balance adjustments for HIGH (increase, average, decrease), LOW (increase, average, decrease), and PERSPECTIVE (front, middle, rear)
- Thermal-cutoff devices to protect

against overload; driver voice coil cooled by ferrofluid

- Entire driver assembly enclosed in perforated metal cover for protection
- Novel spring-loaded connectors accept either bare wires or single or dual banana plugs
- Tapered pyramidal wooden cabinet mounted on casters; removable brown top grille cloth; genuine oak or walnut veneer finish; rosewood veneer or black or white lacquer finishes available on special order for a higher price

ate from the port in the bottom of the enclosure and through the slot between the speakers, which is raised on casters, and the floor.

The Ohm Walsh 4 is 40 inches tall, 12½ inches square at the top, and 15½ inches square at the bottom. It weighs 63 pounds. Price: \$1,895 per pair. Ohm

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MEASUREMENTS

The unusual design of the Ohm Walsh 4 presented some problems in measuring its acoustic performance. For example, the response on the forward axis of the system was appreciably different from that measured at 45 degrees off-axis, in line with the supertweeter. The overall response in the room was a composite of the speaker's output in all directions, making it difficult

HIRSCH-HOUCK LAB MEASUREMENTS

Composite frequency response: 40 to 20,000 Hz \pm 4 dB
Sensitivity: 83 dB SPL at 1 meter with 2.83 volts (1 watt) input
Impedance range: 6.5 to 16 ohms
Phase coherence: group-delay variation from 500 to 20,000 Hz

less than \pm 0.2 millisecond
Bass distortion (measured at input level needed for 90-dB SPL output at 1,000 Hz): 1 per cent from 100 to 70 Hz; 3.7 per cent at 50 Hz; 5.25 per cent at 40 Hz; 9.5 per cent at 35 Hz

to characterize it by an FFT measurement on any one axis. While this is true of any speaker, a further complication in this case was that the measured response, even with close microphone spacing, depended on whether the microphone was near the bottom, middle, or top of the main cone radiator. In addition, the output measured at the port (under the cabinet) was not the same as that measured in the narrow slot between the cabinet edges and the floor.

With all the frequency-balance switches at their center settings, the averaged room response was smooth and flat, within ± 4 dB from 500 to 20,000 Hz. The bass response, measured as close to the bottom of the speaker cone as the protective cage allowed us to get, was flat within ± 2 dB from 60 to 500 Hz, and it could be spliced unambiguously to the room curve. The port output was at its maximum

at 30 Hz and was within ± 2 dB from below 20 to about 60 Hz. We could not establish the proper relative contributions of the cone and port in the lowest range, but the composite response of better than ± 4 dB from under 40 up to 20,000 Hz was consistent both with what we heard and with

Ohm's rating of 32 to 17,000 Hz ± 4 dB.

Our lab measurements showed an omnidirectional response below 1,000 Hz, with the rear radiation being suppressed by 20 dB or more above 2,000 Hz. With the two speakers placed a couple of feet from rear or side walls, the imaging was exceptionally good and almost independent of the listening position. Like the original Ohm F, the Walsh 4 had excellent phase coherence, with a group-delay variation that certainly seems to confirm Ohm's claims for the Walsh driver.

The frequency-balance adjustments produced definite, but not excessive,

changes in the speaker's sound quality. We found the center settings to be perfectly satisfactory in our room, but that is a matter of individual taste. The low-frequency switch changes the output by about ± 5 to 7 dB between approximately 60 and 300 Hz. The high-frequency switch range is ± 5 dB from about 2,000 to 13,000 Hz. The PERSPECTIVE control's range is also about ± 5 or 6 dB from 250 to 1,300 Hz, and it can impart either a "forward" or "distant" quality to the sound of the speakers.

THE OHM WALSH 4 IS AS SMOOTH AND NATURAL SOUNDING AS ITS EXCELLENT FREQUENCY-RESPONSE MEASUREMENT SUGGESTS. IT PROVIDES A FULL STEREO STAGE OF SOUND AT ALMOST ANY POSITION.

Ohm rates the Walsh 4's system sensitivity as an 87-dB sound-pressure level (SPL) at 1 meter with 2.83 volts input and all controls at maximum. In our case, with the controls centered (thereby reducing the sensitivity), we measured an 83-dB SPL under those conditions. The sensitivity of the Walsh 4 is slightly lower than average for a speaker of its size, but it should present no problems when used with amplifiers in the recommended output range of 50 to 500 watts per channel. Although Ohm rates the Walsh 4 as a 4-ohm speaker, the lowest impedance value we measured was 6.5 ohms. By traditional criteria, this should be considered a 7-ohm speaker, and it can be expected, therefore, to present an easy load to any amplifier.

We measured the bass distortion at the bottom of the cone with the same close microphone placement we had used for the low-frequency response measurement. The results were excellent and fully consistent with what we

heard. The relative contribution of the port output, which is probably effective in the lowest part of the bass range, could not be assessed.

COMMENTS

The Ohm Walsh 4 is as smooth and natural sounding as its excellent frequency-response measurement suggests. It provides a full stereo stage of sound at almost any position in the room, including a distinct quality of depth resulting (presumably) from sound reflections off the rear and side walls.

Ohm claims that the Walsh driver does not operate as a piston—the usual design goal for a conventional speaker—but rather as a transmission line that progressively delays the propagation of different frequencies so that a coherent cylindrical sound field is radiated. Some years ago, when we tested the original Ohm F speakers, we were able to verify that claim to our satisfaction. Although the Walsh 4 is a modified form of that system, it retains many of its qualities, with the added advantages of a reasonably high sensitivity, noncritical room placement, and a much lower price.

The heavy-duty, high-temperature voice coil of the Walsh driver makes it virtually impossible to overdrive the Ohm Walsh 4 with any home amplifier. We were able to drive a 200-watt-per-channel amplifier to its clipping point with Compact Disc program sources without straining the speakers, which sounded fine at that level.

Ohm makes much of the imaging qualities of this speaker, and it certainly lives up to those claims. A demo record produced by Ohm provides convincing evidence that the Walsh 4, playing a variety of commercial music recordings, is capable of generating distinct spatial images that are apparent from almost any position in the room. For example, Leroy Anderson's musical typewriter moves with impressive smoothness between the speakers, with not a trace of the vague, uncertain, or erratic position shifts that we observed with some other speakers.

In case I have not made the point sufficiently clear, this is a superb-sounding speaker—not inexpensive by any means, but worth every cent of its price.

—Julian Hirsch





We make loudspeakers
correctly.

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Brooklyn, NY 11205
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CONGRATULATIONS!

You are now the owner of the best speakers ever made by Ohm Acoustics. I thank you for having made this selection and wish you many years of good listening.

Enclosed are the simple instructions for assembly and installations. It should take you less than an hour to set up and connect your speakers. It will take some experimenting with room placement and control settings to optimize their performance in your home. Do this at your leisure with a variety of music. No one setting is best for all rooms or we would have left the controls off the speaker.

Enjoy!

John Strohbeen
President

ASSEMBLY INSTRUCTIONS

Your Ohm Walsh 4 speakers come in three cartons. Two cartons each contain identical wooden cabinet bottoms. One carton has 2 grills, the right and left drivers, eight fastening knobs, eight washers and four threaded shipping rods.

Unpack the three cartons, removing all the cardboard packing material. The identical cabinet bottoms can be used for either right or left driver.

CONNECTING THE DRIVER TO THE BOTTOM

Each driver will fit onto the bottom in only one orientation, with the front of the driver (marked) toward the front of the bottom (with the Ohm logo). After fitting the driver onto the bottom, lift the driver off and move it to the front about four inches (10 cm). This should allow you to grasp the connector in the bottom in one hand and the connector from the driver in the other. Press the connectors together. If they do not fit, rotate one connector 180° — they are made to fit only one way so no mistake can be made. After the connectors are pushed tightly together, check the connection by gently trying to pull the wires apart. If properly connected, they should not separate because there is a locking hook on each side that can only be released by squeezing the connectors.

Now put the driver back onto the mounting bolts and fasten down the knobs and washers. Tighten the knobs firmly. If they are loose, the speaker performance will be impaired by leaking air.

The grills also fit only one way so the front will match the front of the speaker.

CONNECTING YOUR OHM WALSH 4 SPEAKERS

The inputs and controls are on the back of the speakers. These inputs can accept bare wire as large as 12 gauge or banana plugs. **IMPORTANT:** When connecting the speakers to the amplifier be sure the phase is consistent. The red terminal is the hot (+) input and the black terminal is the negative (-) input. A ridge or color coding above one side of each wire will help you. If one speaker is connected correctly and the other reversed, you will get poor bass response and a wandering imprecise stereo image. This is always worth double checking.

ROOM PLACEMENT

The placement of the speakers in your room affects the bass response and the stereo imaging ability. The bass control switch can generally compensate for the effects in the low frequencies. Speakers get more low frequency output near walls and corners, so the bass control can be set in the reduced position. When away from all walls, the increased position may be better.

The stereo image created by the Ohm Walsh 4 is probably the best available from any speaker in the world, particularly if more than one person is listening at the same time. Be sure to have the speakers with top marked "right front" on the right side and the top marked "left front" on the left side. The stereo image will appear spread completely from the right speaker to the left, so place the speakers as far apart as you desire the stereo scene to be wide. Occasionally, on exceptionally well made records, the stereo image will extend beyond the speaker spacing. The opti-

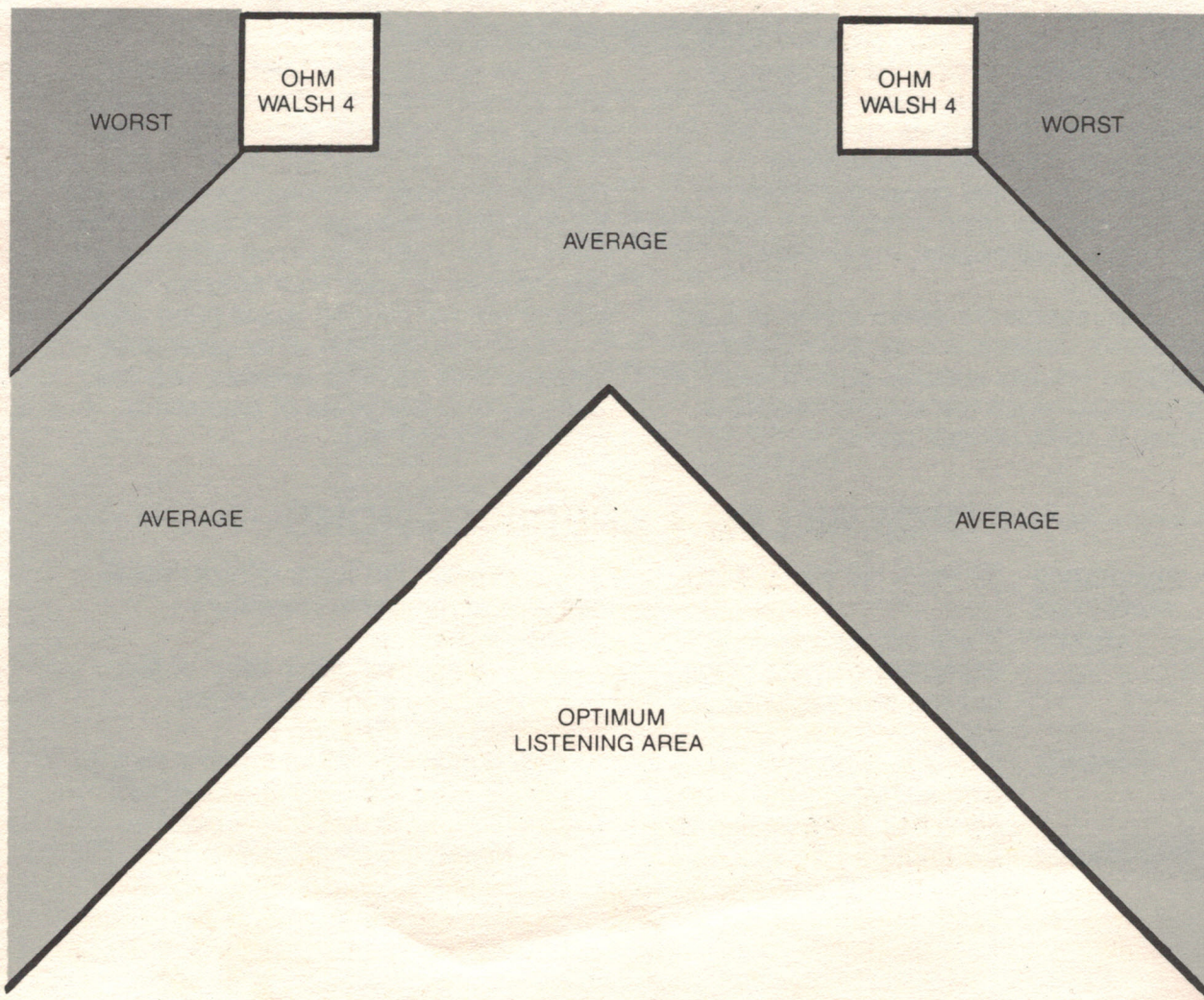
imum listening position is at least as far back as the speakers are separated and anywhere between them. See Figure "Top View."

The Ohm Walsh 4 has been designed to minimize problems caused by reflections from behind and beside the speakers. If there are very hard surfaces within 2 or 3 feet of the speaker it might

have some effect upon the stereo image. Experiment to get the best results. The speaker can be placed flush against the wall for most listening and easily moved forward on the casters for critical listening and evaluating new records or components.

Properly set up, your Ohm Walsh 4 will give you many years of great sound.

Listening Positions, Top View



CAUTION

Following these simple rules will insure you many years of enjoyment from your Ohm Walsh 4 loudspeakers.

The power handling capacity of your loudspeaker has been conservatively rated. Ferro Fluid and Ferro Lube™ cooling as well as thermal overload devices are built into the drivers to absorb momentary overloads.

Although your Ohm Walsh 4 is rated to be used with amplifiers of up to 500 watts per channel, it is possible to damage your loudspeakers with smaller units. Disco, heavy rock, crescendos in classical music, accidental dropping of the tonearm on your record or rapid changing of FM stations can drive an amplifier to produce an inordinate amount of distorted power (as much as 10 times the rated amount) which is fed to the loudspeaker — possibly damaging it.

Also please be aware that your bass and treble controls are simply frequency localized volume controls and should not be boosted when the volume control is in the 1/2 to 2/3 danger zone.

WARNING

Do not remove circular metal grill. The Ohm Walsh 4 incorporates several critically placed tufflex transmission blocks. This acoustically transparent metal grill has been permanently bonded to its housing in order to protect precise alignment and performance of these blocks. Removal or damage of the grill will seriously impair performance and void warranty.

ATTENTION

Your Ohm Walsh 4 is well-protected

This speaker has been equipped with an extra Thermo-Guard™ protection device. If the speaker approaches thermal overload (usually the result of clipping a low-power amplifier) its output will be drastically reduced. Turn the amplifier power down, and the circuit will reset in two minutes or less. Your speaker will play at normal volume levels once again.

With this and the other protection systems built into this speaker, you are assured of many years of enjoyment.

Good Listening!

OHM WALSH 4 SPECIFICATIONS

Frequency Response	32 Hz - 17 Hz ± 4 dB	Power requirement on Music	50 watts minimum/500 watts maximum
Inputs	Press connectors accepting banana plugs or bare wire up to 12 gauge.	Size	40" tall x 12½" at top, x 15½ at bottom
Controls	3 — low, high and perspective each has three positions	Weight	63 lbs
Impedance	4/4 ohms	Efficiency	87 dB at 1 meter with a 2.83 volt input with all controls at maximum
		Finish	Genuine wood veneer.