

Monitor Series Loudspeakers



The Polk Audio Monitors are sophisticated reference-quality loudspeaker systems. They were developed to meet design criteria calling for efficient, high-definition reproducers which would accurately recreate the sound field of the original performance.

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A High-Definition Loudspeaker

High-definition loudspeakers will reveal all the subtle details of the program material. This high resolution capability is in large part due to the consistently excellent transient response and uniformly low harmonic and IM distortion characteristics of each driver in its assigned operating range.

Early in the design program which produced the Monitor Series, we realized that consistency of definition among various drivers covering different frequency ranges in a loudspeaker system is more essential to the natural reproduction of music than the possibility of marginally higher definition over just one part of the bandwidth. All too often, exotic, high-frequency drivers of high definition are combined in systems with a relatively low-definition ten- or twelve-inch conventional woofer. Usually, the woofer is being asked to perform both as a low-frequency and mid-range speaker in these systems. The result is a terribly confusing lack of homogeneity in the reproduction of instruments in different frequency ranges. Orchestras sometimes seem to be placed half three feet in front of the listener and half about a hundred feet behind the wall. An instrument like the tenor saxophone, whose range extends across the crossover point between the two drivers, can seem to leap out from behind a thick blanket every time the musician goes from a low note to a high one.

In the Monitor Series we have selected drivers having similarly excellent transient response and low-distortion characteristics in their response ranges and combined them in full-range systems. The results are loudspeakers of exceptional clarity and ultra-low distortion.

The Polk Audio Fluid-Coupled Low Frequency System

The poor transient response of a conventional woofer above approximately 100 Hz generally eliminates its usefulness in a truly high-definition speaker system. Unfortunately, the use of an electrical crossover network at such low frequencies results in a severe loss of coupling between the amplifier and the individual drivers in addition to causing a power-consuming loss of efficiency and a tremendous increase in harmonic, IM, and phase distortion.

All Polk Audio loudspeakers use a unique fluid-coupled low-frequency loading and radiation system which is markedly superior to acoustic suspension, ported, and transmission line systems in terms of control, definition, phase coherence, and efficiency. In addition, a very special quality of bass reproduction is achieved which is tight and definitive as well as deep and powerful.

The low-frequency energy from the six and a half inch base-midrange driver units is used to energize the low-resonance sub-bass radiator below 60 Hz. The fluid coupling between the drivers and the sub-bass radiator both critically damps the system and provides fourth order Butterworth loading for the energizing cones. By applying acoustic, rather than actual mass to the active diaphragms, exceptionally low system resonance is achieved in conjunction with the fast, accurate transient response of a low-mass direct radiating diaphragm. In addition, the perfectly-controlled movement of the drivers is precisely amplified by this acoustic transformer.

The result is remarkably clear, well-defined low frequency reproduction, exhibiting exceptional upper bass detail which extends smoothly and seamlessly down through the sub-bass and imperceptibly up into the midrange.

The Plasticized Bass-Midrange Driver

The fundamental frequency range between 50 and 3000 Hz is absolutely critical in the accurate reproduction of musical material. Below this lies the sub-bass, above it harmonic overtones. In order to preserve the sonic integrity of this frequency range and prevent phase distortion within it, one very special driver unit was developed to span this entire range.

The high-definition bass-midrange driver is a remarkably elegant electro-acoustic device. An extremely low-mass fiber-impregnated cone first undergoes a special stamping process during which a stiffening agent is introduced. It is then further treated with two plastic compounds which damp it both internally and externally, effectively eliminating ringing and resonant effects. A lightweight voice coil assembly is coated and then attached to the cone with special high-temperature epoxy. A highly-compliant butyl rubber surround and long-throw spider assure unimpeded linear cone movement. High magnetic flux density combined with the low mass moving system results in nearly instantaneous transient response, low distortion, and high efficiency.

A copper-plated pole piece is used to eliminate internal eddy currents, preserving phase coherence well beyond the operational range of the drivers.

The Soft-Dome High-Frequency Unit and Isophase Crossover

The transition at 3000 Hz from the bass-midrange driver to a superb one-inch soft-dome high-frequency unit is accomplished smoothly and imperceptibly by means of a sophisticated 12 dB/octave isophase crossover network. This unique filter system uses huge air core coils and precision capacitors and resistors to assure lowest harmonic, IM, and transient distortion even with complex, high-level musical signals. In addition, phase coherence is maintained by the complementary phase relationships achieved by the circuitry.

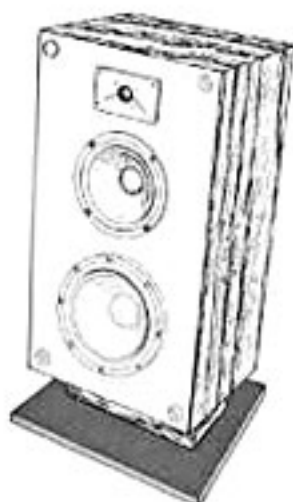
The newly-developed hemispheric-dome tweeter incorporates a special, critically-damped fabric diaphragm ensuring definitively smooth response even after prolonged heavy loading. The voice coil is wound on an aluminum former to withstand high power inputs without thermal damage. The exceptionally high magnetic flux density of 15,000 gauss combined with the nearly massless diaphragm ensures very low distortion and exemplary transient response. The tweeter exhibits a nearly-level power response curve (flat power radiation into the room) which results from the use of a small, geometrically correct one-inch diaphragm. Flat power radiation is indicative of consistently wide dispersion of the highest frequencies. The nearly hemispheric radiation pattern of this unit eliminates "hot spot" effects and ensures that the Monitor Series loudspeakers will function accurately from any position in your room.

The PolkStand

Fundamental research into the acoustical interactions of a loudspeaker and its physical environment has shown that in many instances it is desirable to support the loudspeaker several inches off the floor and angled up towards the listener. This both eliminates undesirable floor-coupled resonant effects and focuses the speaker system by equalizing the distance between the different drivers and the listener's ears. To facilitate this, the PolkStand was developed. This optional accessory can be used with both the Model Seven and the Model Ten to achieve optimum placement and performance.

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SPECIFICATIONS



Model 7

One 1-inch soft dome high frequency radiator
 One 6½-inch plasticized bass-midrange driver
 One 8-inch low-resonance sub-bass radiator
 Sub-bass radiator/sealed system

24H x 14W x 9½-D

36 pounds

30 Hz - 25,000 Hz 40 Hz - 20,500 Hz +/- 2 dB

10 - 50 watts per channel

60 Hz and 3,000 Hz

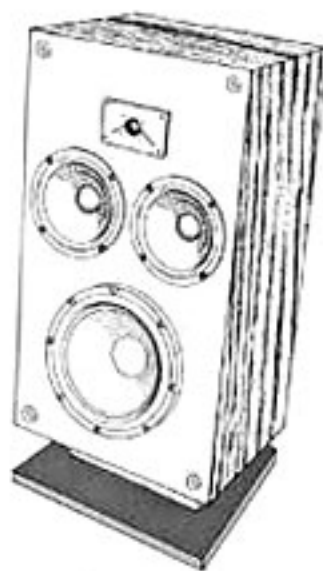
8 ohms

30 Hz

105 dB

Standard finish walnut woodgrain vinyl

Limited five years parts and labor
 (See detailed warranty statement)



Model 10

One 1-inch soft dome high frequency radiator
 Two 6½-inch plasticized bass-midrange drivers
 One 10-inch low-resonance sub-bass radiator
 Sub-bass radiator/sealed system

28H x 16W x 11½-D

50 pounds

22 Hz - 25,000 Hz 32 Hz - 20,500 Hz +/- 2 dB

10 - 100 watts per channel

60 Hz and 3,000 Hz

6 ohms

20 Hz

112 dB

Standard finish walnut woodgrain vinyl

Limited five years parts and labor
 (See detailed warranty statement)

Driver Complement

Enclosure type

Size (inches)

Shipping weight

Frequency response

Recom. min. & max. power

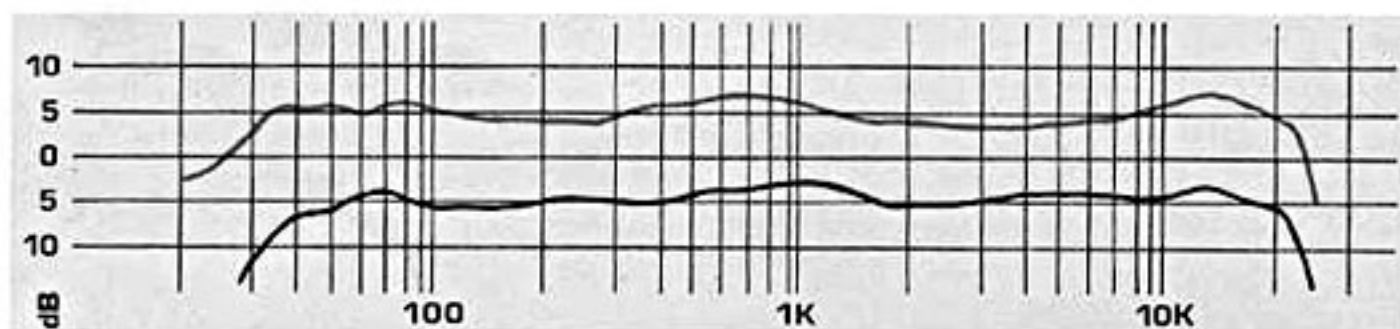
Crossover frequency

Impedance

System resonance

Maximum output level

Warranty



On-axis response in controlled reverberant field environment. Curves are offset 10 dB for clarity of presentation.

Model 10: Brown Line

Model 7: Black Line

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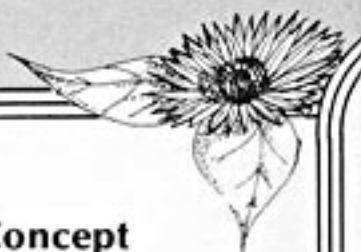
4900 Wetheredsville Road, Baltimore, Maryland 21207

Objectives

The research and development program which produced the Monitor Series had as its major objectives:

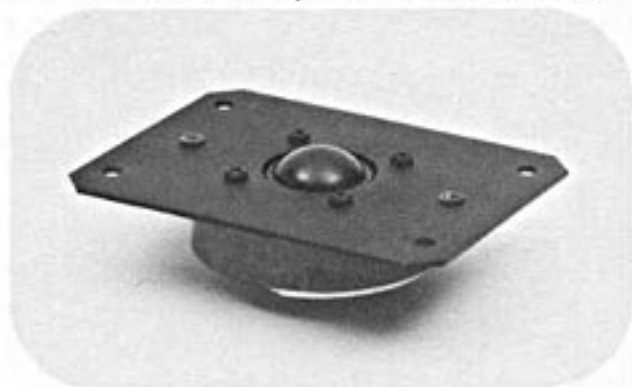
1. Open, boxless, three-dimensional sound;
2. Smooth, accurate frequency response across the musically relevant audio bandwidth;
3. Phase coherence independent of frequency;
4. Nearly-perfect hemispheric dispersion;
5. Consistently excellent transient response, not just in one or two frequency ranges, but perfectly matched across the total bandwidth (30-23,000 Hz);
6. Stable stereo and quadraphonic imaging; and
7. Efficiency sufficient to allow use with virtually any high fidelity amplifier or receiver.

The successful attainment of these objectives is immediately evident when you sit down and listen to your finest recordings. The loudspeakers seem to disappear in a highly detailed, three-dimensional panorama of sound.



An Integrated Design Concept

The exceptional performance which characterizes the Monitor Series loudspeakers is not the result of any single feature or facet of their design. Concepts such as our unique Fluid-Coupled Low Frequency System, as well as low-distortion components such as our



soft-dome high-frequency unit, isophase crossover network, and high-definition



plasticized bass-midrange drivers are all important. It is, however, the elegant



integration of concepts and components which results in the superior performance which sets the Monitor Series apart.