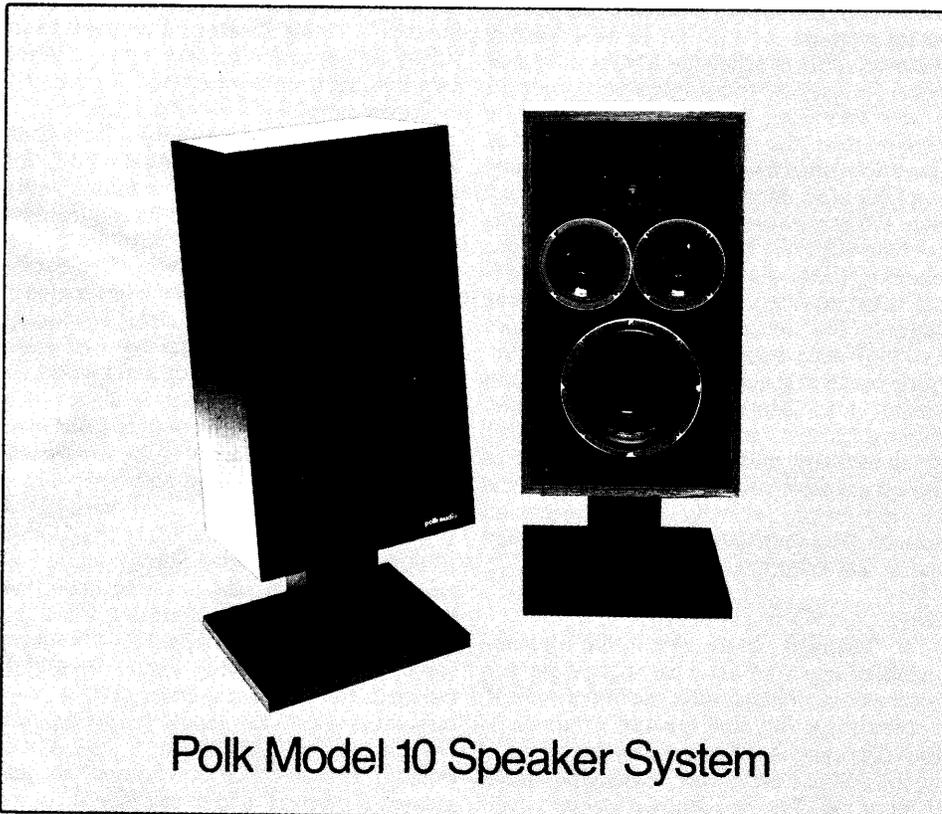


Stereo Review®

Equipment Test Reports By Hirsch-Houck Laboratories

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Polk Model 10 Speaker System

POLK AUDIO is a small loudspeaker manufacturer whose products are distributed principally through high-fidelity specialist dealers. Although these stores often carry very high-price products, Polk speakers are priced competitively with better-known and more widely distributed brands.

The Polk Model 10 "Studio Monitor" is a medium-size floor-standing system, although Polk suggests mounting it on a pedestal (which they also manufacture) that raises the speaker about 9 inches off the floor and tilts it back slightly. The Model 10 is a two-way system with a rather unconventional driver configuration. The bass and much of the midrange is handled by a pair of nominally 6½-inch-diameter midrange/woofers located side-by-side just above the center of the speaker's front panel. Just above them is a 1-inch soft-dome tweeter. Below the woofers, and occupying most of the lower portion of the panel, is a nominally 10-inch-diameter

passive-radiator. There are no user-accessible level-balancing adjustments.

The basic design philosophy behind the Model 10 is clearly presented in Polk's literature. Polk sought an "open, boxless, three-dimensional" sound, a smooth, accurate frequency response across the musically relevant audio band (by implication, infrasonic and ultrasonic responses were not part of the goal), excellent transient response across the 30- to 20,000-Hz band, nearly perfect hemispherical dispersion, stable stereo imaging, enough efficiency so that the system could be driven by virtually any high-fidelity amplifier, and reasonable size to permit bookshelf mounting if desired.

It is easy to appreciate the advantages of using a pair of small-diameter (but long-throw) woofers that can radiate much of the midrange as well as the upper- and mid-bass frequencies. Avoiding a crossover in the midrange (the most audibly important part of the

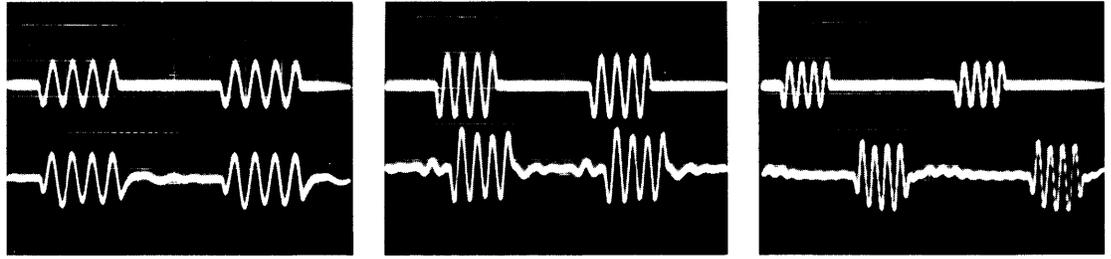
musical spectrum) is the best way to eliminate or minimize many of the colorations that have been attributed to crossover networks.

Polk specifies the crossover frequency to the tweeter as 3,000 Hz, but it was not detectable by ear or by measurement. The crossover network uses air-core coils and precision capacitors and resistors to provide 12-dB-per-octave cutoff slopes. The transition from the driven elements to the passive radiator is stated to be at 60 Hz, and this "acoustical crossover" is Polk's basis for describing the system as a "three-way design." The semantic distinctions between "two-way" and "three-way" speaker systems aside, the passive cone does extend the useful range of the Model 10 into the low bass without requiring a conventional woofer or a low-frequency crossover network.

The Polk Model 10 system is 28 inches high, 16 inches wide, and 11¾ inches deep. It weighs about 45 pounds, a little bulky for bookshelf use. The cabinet is finished in rosewood vinyl, and the black-cloth-covered grille assembly is held in place by plastic snaps. The terminals are recessed into the rear of the cabinet together with a fuse that protects only the tweeter from overdrive damage. When mounted on the optional wooden tilt base, the highest point on the speaker cabinet is about 37½ inches above the floor. The suggested retail price of the Polk Model 10 is \$250. The stands are \$45 a pair.

● **Laboratory Measurements.** Polk suggests angling the Model 10 speakers slightly inward for best dispersion and stereo effect. We did so for most of our listening (it seemed to give best results) and also measured the frequency response of the speakers with the two both angled and facing forward. The results were absolutely identical. The dispersion of the 1-inch dome tweeter was exceptional, and we could measure no significant difference between the outputs of the left and right speakers with the microphone on the axis of the left unit and about 30 degrees off the axis of the right speaker. The low-frequency response was measured with the microphone close to the cone of one driven woofer (the two are in parallel) and again in front of the passive radiator. The two curves were combined, after correcting for the total radiating areas of the direct and passive cones, and the bass

The exceptional tone-burst response of the Polk Model 10 speaker system is shown at (left to right) 100, 1,000, and 10,000 Hz. The input-signal traces are at the top in the oscilloscope photos.



curve was spliced to the higher-frequency curve (which was made in the reverberant field of the room).

The bass response in the composite curve was gently emphasized, peaking at +2.5 dB in the 60- to 80-Hz range, compared with the midrange level. The output fell at 6 dB per octave below 60 Hz, and at 20 Hz it was only 6 dB below the 1,000-Hz level. The passive-cone output was predominant below 55 Hz. (There were minor irregularities in the midrange response, but our measurement method does not permit us to separate the contributions of the room and the speaker in this frequency range clearly.) The output then rose smoothly above 8,000 Hz to a maximum of +5 dB at 15,000 Hz. Overall output variation, relative to the 1,000-Hz level, was ± 5 dB from 23 to 20,000 Hz.

The low-frequency distortion was measured separately for the driven and passive cones at nominal drive levels of 1 and 10 watts (based on a nominal 8-ohm impedance). At 1 watt, distortion was about 1 per cent from 100 to below 40 Hz, increasing to 5.5 per cent at 25 Hz (the distortion percentages at the passive and driven cones were taken at frequencies where each was dominant). A 10-watt drive level increased the distortion considerably, to between 2 and 5 per cent in the range from 100 to 33 Hz and to 12 per cent at 30 Hz.

The speaker impedance reached a minimum of 4 ohms at 33 and 150 Hz, and a maximum of about 15 ohms at 55 Hz (there was another maximum below 20 Hz, where we did not measure it). From about 500 Hz upward, the impedance was always at least 7 ohms. Strictly speaking, the Model 10 should be rated at 4 ohms, although Polk gives the

impedance rating as 6 ohms.

The sensitivity of the Model 10 was moderate, so that a drive level of 2.83 volts (nominally 1 watt into 8 ohms) produced a sound-pressure level of 89 dB at a 1-meter distance. This is relatively low for a vented system (a passive radiator can be considered a vent substitute or equivalent), but it is higher than the sensitivity of a typical acoustic-suspension system. The tone-burst response of the Model 10 was exceptional; not only did it produce nearly ideal tone bursts over the full audio range, but the microphone placement was almost completely noncritical. Our experience with tone-burst testing suggests that the ability to generate "nice looking" tone bursts at a few selected frequencies or at specific microphone positions means little. Most speakers can do that. When a speaker can deliver clean tone bursts at almost any microphone location and at almost any frequency in the audio band, it can be said to have a really good transient response. The Polk Model 10 speaker system meets that tough criterion fully.

● **Comment.** To the extent that measurements of any kind can characterize the performance of a loudspeaker, the Polk Model 10 is certainly a very fine speaker. Although its bass distortion is not necessarily the lowest, it is not audible under any reasonable conditions of use. The frequency response covers the entire audio range with commendable flatness — again, not quite so flat as a few other speakers we have tested, but a lot flatter than many others.

Some of Polk's key design goals have defin-

itely been realized. The transient response of the Model 10 is absolutely first-rate, and the hemispherical dispersion is superb (we cannot recall measuring better dispersion on any forward-radiating speaker). The speaker sensitivity is adequate for use with a 10-watt amplifier, yet it could absorb the full output of a 200-watt amplifier without damage.

We have left the purely subjective matters to the last. In our judgment, Polk has achieved something very close to the "open, boxless, three-dimensional" quality they were seeking. We would probably have chosen those adjectives ourselves to describe the sound of the Model 10, but Polk has spared us the chore of finding suitable descriptive terms. These characteristics are not easily definable, but once one has heard that quality in the sound of a speaker, it is not soon forgotten. Polk is not the only speaker manufacturer to have achieved it, by any means, but their numbers are few, and especially so in this price range.

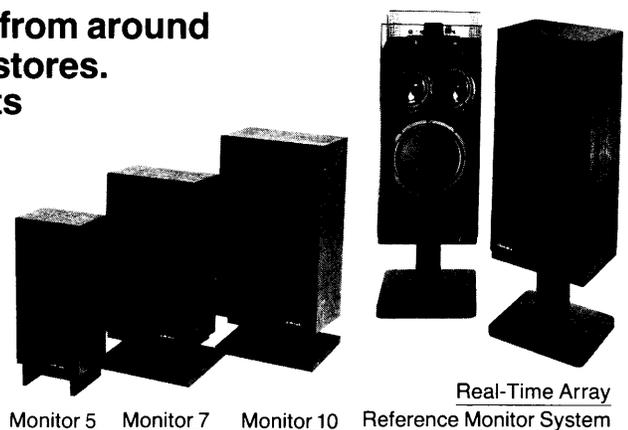
We compared the sound of the Polk Model 10 to that of several other fine speakers, both larger and smaller, and we were rather surprised at the magnitude of the differences we heard. The Model 10 has a slight tendency toward warmth, possibly due to its slightly elevated mid-bass response, and a crisp brightness from its gently rising top end (which may also contribute to its "open" quality). Both of these "colorations" are very subtle — more of a faint tint than a coloration, actually — and the total effect is of an exceptionally pleasing sonic balance with plenty of spaciousness or "depth." Our overall reaction is that the Polk Model 10 sounds good — very good!

Polk Audio Monitor Series Loudspeakers, priced from around \$125 each, are available at the world's finest hi-fi stores. Write us for complete information on our products and the location of the Polk Audio dealer nearest you.

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