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Infinity Qa Speaker System



THE Quantum series of speaker systems from Infinity all include a novel tweeter of the company's own design. From the \$1,250 Quantum Line Source to the \$145 Model Qa, the same high-frequency driver is used (in multiples on the more expensive models) to give a very wide-range, well-dispersed treble response.

In the bottom-price Model Qa, a single electromagnetic induction tweeter (EMIT) is paired with a new 10-inch "Q-woofer" specially developed to complement the tweeter's characteristics. The EMIT does not resemble conventional tweeters whose cones or domes are driven by cylindrical voice coils. It has a flat, very-low-mass plastic diaphragm with a pattern of etched conductors in two parallel groups along the length of the diaphragm. The conductors are in a powerful magnetic field provided by two samarium-cobalt magnets. The audio-signal current passing through the conductor pattern causes the diaphragm to move back and forth in the magnetic field, displacing air and creating a pressure wave that issues through four narrow slots in the metal faceplate.

Because of its limited diaphragm excursion, the EMIT can operate only at the higher treble frequencies. Therefore, the Q-woofer must handle a rather wide frequency range. In the Qa system, the crossover between the drivers takes place at 2,500 Hz. In order to have a 10-inch woofer that can function properly at 2,500 Hz, Infinity designed a unit with a phosphor-bronze voice-coil former which is claimed to have lower eddy-current effects

than conventional aluminum formers and thus to provide a faster rise time.

In addition, the cone and its butyl-rubber surround are designed so that the outer portions of the cone are progressively decoupled from the voice coil at higher frequencies. As Infinity describes it, the effective woofer-cone mass therefore varies with frequency, so that good low-frequency response is combined with good mid-range transients.

The nominal impedance of the Infinity Qa is 4 ohms, and it is rated for use with amplifiers delivering from 15 to 150 watts per channel. The rated frequency response is 42 Hz to 32,000 Hz ± 3 dB. Although the Qa is no larger than many "bookshelf" systems, Infinity recommends that it be mounted about 12 inches off the floor and a couple of feet from a wall for best results. A metal pedestal is offered as an optional accessory for just that purpose.

The woofer operates in a sealed cabinet, covered with wood-grain vinyl, that measures 25 x 14 x 12 inches. The system weighs just under 40 pounds, and the brown cloth grille is removable. A tweeter control on the rear of the cabinet adjusts the high-frequency level over a limited range. Price: Infinity Qa, \$145; pedestals, \$44 per pair. Prices are slightly lower west of the Mississippi.

● **Laboratory Measurements.** We installed the Infinity Qa speakers on the recommended pedestals for listening and measurement purposes. (The speakers can be tipped over backwards when so installed, so caution is advis-

able if there are small children in the home.)

In the reverberant field of the room, the high-frequency response followed the shape of the microphone-calibration curve up to its limit of 15,000 Hz. When the close-miked bass-response curve was spliced to the middle- and high-frequency curve, the composite response was within ± 3.5 dB from 42 to 15,000 Hz. This is impressively close to the Infinity rating, especially in view of our very different test conditions (which measure the sound in a normal listening relationship to the speakers and in a normal room instead of an anechoic chamber).

The high-frequency dispersion was superb. There was only about 2 dB difference between the response curves measured on-axis and 30 degrees off-axis in the 10,000- to 15,000-Hz range. The tweeter level control had a range of about 3 dB, and it began to take effect at about 4,000 Hz.

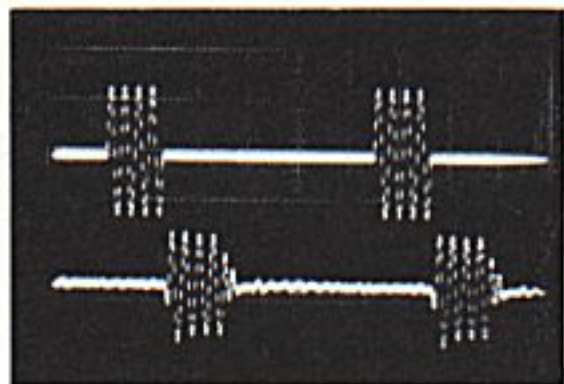
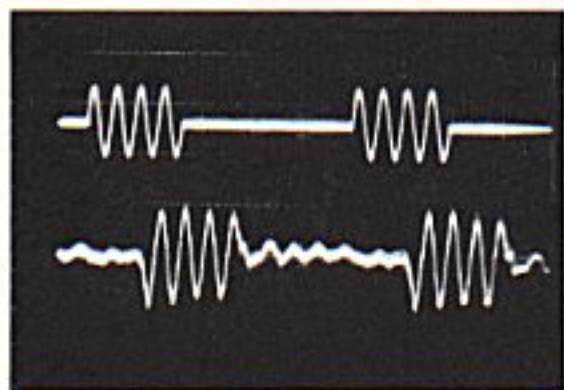
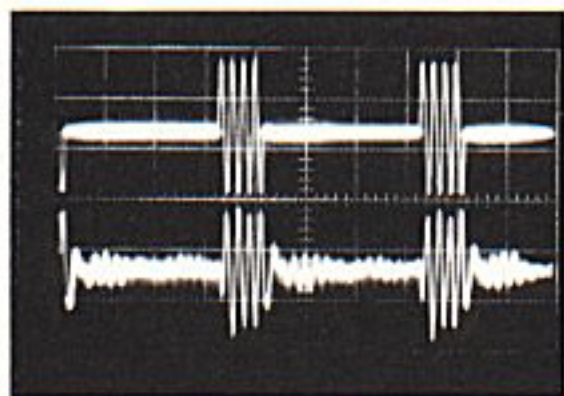
The woofer distortion was measured with a 2.8-volt drive level (equivalent to 1 watt into an 8-ohm load) and also at 8.9 volts (10 watts). Since the speaker is actually a 4-ohm unit, the effective drive levels used in testing were 2 and 20 watts. The distortion at the lower drive level was between 2 and 4 per cent from 100 Hz down to 45 Hz, rising to 10 per cent at 38 Hz. At higher drive levels, the measured distortion rose considerably. This result was explained when we measured the sensitivity ("efficiency") of the speaker. Driven by 2.8 volts of random noise in the octave centered at 1,000 Hz, the Qa produced a 92-dB sound-pressure level (SPL) at a distance of 1 meter from the center of the grille. This corresponds to a fairly loud listening level. The higher drive level produced a very loud 102-dB SPL. In practice one would be unlikely to operate this speaker at such levels, and the bass distortion would therefore never become excessive. Extended listening (using a 400-watt amplifier) confirmed this.

The impedance of the Qa was 4 ohms at 20 Hz, 100 Hz, and 20,000 Hz, and it reached a maximum of 15 ohms at 50 Hz and 1,300 Hz. The tone-burst response was excellent at all frequencies, and we noted the rapid start-up of the woofer in the 100-Hz burst.

● **Comment.** As usually happens, our preliminary listening experience had already given us a good idea of what test results to expect from the Infinity Qa, and we received no surprises. The Qa is an unusually clear, transparent-sounding speaker (our apologies for using that overworked adjective, but it truly applies to the Qa). The high-end response, in particular, was at least the equal of anything else we have heard in regard to smoothness and dispersion. Furthermore, it was so well blended with the woofer output that we felt a sense of listening to a single unified sound source. Our simulated live-vs.-recorded listening test also gave the Qa perfect marks for

its upper-mid-range and high-frequency accuracy. We could hear some extra warmth in the lower mid-range or upper bass, but only upon direct comparison to the original "live" sound. Although we did not deliberately abuse the speaker, we did play it very loud, using the full potential of a 200-watt-per-channel amplifier. The speaker never sounded strained, nor was it damaged.

Reading the Infinity brochure on the Qa, we were struck by the accuracy with which it described the speaker's essential sound character. The Infinity Qa has the spaciousness and smoothness claimed for it. It is undoubtedly one of the best loudspeaker values in today's market. One could pay several times as much and not get nearly so accurate a system.



The fine tone-burst response (lower trace) of the Infinity Q_a at (top to bottom) 100, 2,000 and 7,000 Hz typifies its response throughout its range.