

FORMERLY HI FI/STEREO REVIEW

Stereo Review

FEBRUARY 1972

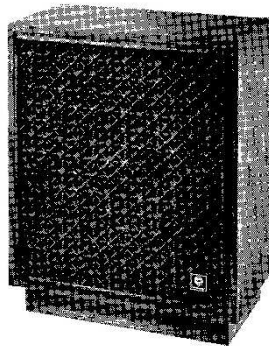


TECHNICAL TALK

By JULIAN D. HIRSCH

TESTED THIS MONTH

●
Crown D-150 Power Amplifier
Scott 433 Stereo FM Tuner
Rectilinear III Lowboy Speaker
Teac 4010SL Tape Recorder



Rectilinear III Lowboy Speaker

● SEVERAL years ago we tested a speaker—the Rectilinear III—from a then little-known manufacturer, Rectilinear Research Corporation. It was (and still is) a floor-standing three-way speaker system of medium size, having six drivers in all. It made a strong positive impression on us at the time because of its exceptionally smooth, transparent sound, with less coloration in any part of the audio spectrum than we were accustomed to hearing from other good dynamic speaker systems of that time. In fact, we could only liken its sound to that of a good full-range electrostatic speaker.

A number of people, here and abroad, have taken us to task for that comment and have strongly disagreed with it. Our intention was not to imply that the high-frequency performance of the Rectilinear III was sonically *identical* to that of an electrostatic speaker (for no dynamic speaker we have ever heard can claim to be that), but rather that it had much of the essential character and freedom from coloration that we associate with electrostatic systems. Over the years there have been changes in the components of the Rectilinear III, and many people, including ourselves, have wondered if today's Rectilin-

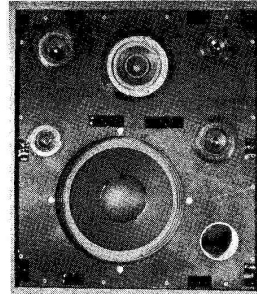
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ear III is still the same speaker system that received our accolades in 1967.

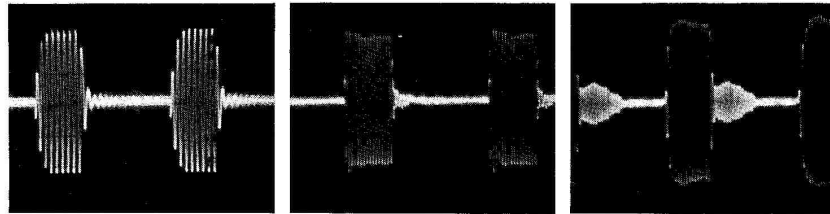
Rectilinear has now repackaged the system in a low-boy cabinet, and we have tested this version using several techniques that were not available to us at the time of our original test. The Rectilinear III Lowboy is 28 inches high, 22 inches wide, and 12 $\frac{1}{4}$ inches deep. It weighs about 65 pounds, and features a very attractive wooden fretwork grille. The 12-inch woofer operates in a ducted-port enclosure, with a 6-dB-per-octave crossover at 500 Hz to a 5-inch mid-range driver with a 2-inch "whizzer" cone. The mid-range speaker, which operates up to 3,000 Hz, is responsible for the bulk of the audible sound from the system. At 3,000 Hz there is another 6-dB-per-octave crossover to an array of four tweeters, arranged in a rectangle occupying the upper 60 per cent or so of the speaker board. All of them operate together, but the two 2 $\frac{1}{2}$ -inch tweeters are mostly effective below 11,000 Hz, while at higher frequencies all are operative. All the tweeters are cone drivers, of conventional appearance, and their levels are adjusted simultaneously by the control in the rear of the cabinet.

The six speakers are distributed on the front of the



The Rectilinear III Lowboy design employs a ported enclosure with a 12-inch woofer, 5-inch mid-range, and four cone tweeters distributed over the front panel.

Tone-burst response of the Rectilinear III Lowboy was nearly perfect, with only the 10,000-Hz burst (far right) showing some irregularity due to interference between the four tweeters. Other frequencies shown are 60 (left) and 2,000 Hz (center).



unit in a configuration that is slightly different from that used in the upright Rectilinear III. The woofer is at the bottom, with the mid-range driver above it. On one side, the 2 $\frac{1}{2}$ -inch tweeter is at the top of the rectangle, while on the other side it is at the bottom. This is claimed to give improved dispersion of high frequencies. The Rectilinear III Lowboy, in oiled walnut, is priced at \$299.

● **Laboratory Measurements.** We measured the averaged frequency response of the Rectilinear III Lowboy with a multi-microphone array in a live room, with the level controls at maximum settings, at the center (NORMAL) settings, and at minimum. Flattest response was obtained with both controls at maximum. It was uniform within ± 4 dB from 100 to 15,000 Hz, with a rise of about 5 dB in the 60- to 70-Hz region, and a solid bass output down to 35 Hz or below. With NORMAL control settings, the output curve sloped off above 2,000 Hz, and was down about 3 dB at the higher frequencies. At minimum settings, the output fell to negligible levels above 1,700 Hz.

For comparison purposes, we measured the response of our original Rectilinear III system using our current test set-up. It was quite similar to the response of the new speaker, with controls set at maximum, but had 2 to 4 dB more output in the octaves between 500 and 1,000 Hz and between 2,000 and 4,000 Hz. There was also about 5 dB more output between 10,000 and 15,000 Hz. (While these are not major differences, they could be heard under certain conditions.)

The low-frequency harmonic distortion was quite low down to 40 Hz, where it measured only 2 per cent at a 10-watt drive level. It rose to 5 per cent at 36 Hz and 12 per cent at 30 Hz. At a 1-watt drive level it was lower, but could not be measured due to masking by ambient noise and hum levels. The impedance of the Rectilinear III Lowboy was exceptionally uniform—between 10

and 20 ohms over the full audio range except at 20,000 Hz, where it reached the rated impedance of 8 ohms.

Tone-burst response was very good—nearly perfect, in fact—at most frequencies. This was surprising, in view of the multiple drivers and the possibility of interference effects between them. However, interference was encountered only at about 10,000 Hz, where it was impossible to separate the contributions of the four tweeters.

● **Comment.** The simulated "live-vs.-recorded" listening test confirmed our original appraisal of the Rectilinear III. At the upper middle and high frequencies, the system did an essentially perfect job of duplicating our "live" music. At times, the mid-range seemed slightly less "full" than that of the original program, but the effect was quite subtle. We applied the same test to our original Rectilinear III (one of the first manufactured) with generally similar results, except that the mid-range was, if anything, slightly *too* full! Clearly, the response variations revealed by this test are minute—perhaps only 1 or 2 dB—since the 3-dB average difference between the two speakers in one or two octaves was able to swing the imbalance in the opposite direction. The dispersion of the Rectilinear III Lowboy was excellent, with no perceptible change in the highest frequencies over a ± 45 -degree angle, and a barely detectable dropoff at 60 degrees off axis. At the time of our original Rectilinear III test, dynamic speaker systems with this order of smoothness and lack of coloration were rare; today there are more, but still not very many. We have no way of knowing what permutations in internal design and sound quality the Rectilinear III has gone through between our original model and the one tested for this report. But the two samples we have tested are among the best-sounding and most "natural" speakers we have heard.