

## Dynaco A-25XL Loudspeaker

### MANUFACTURER'S SPECIFICATIONS

**Enclosure Type:** Aperiodic suspension.  
(highly damped vent).

**Woofers:** 10-in. (25.4 cm).

**Tweeter:** 1-in. (2.54 cm).

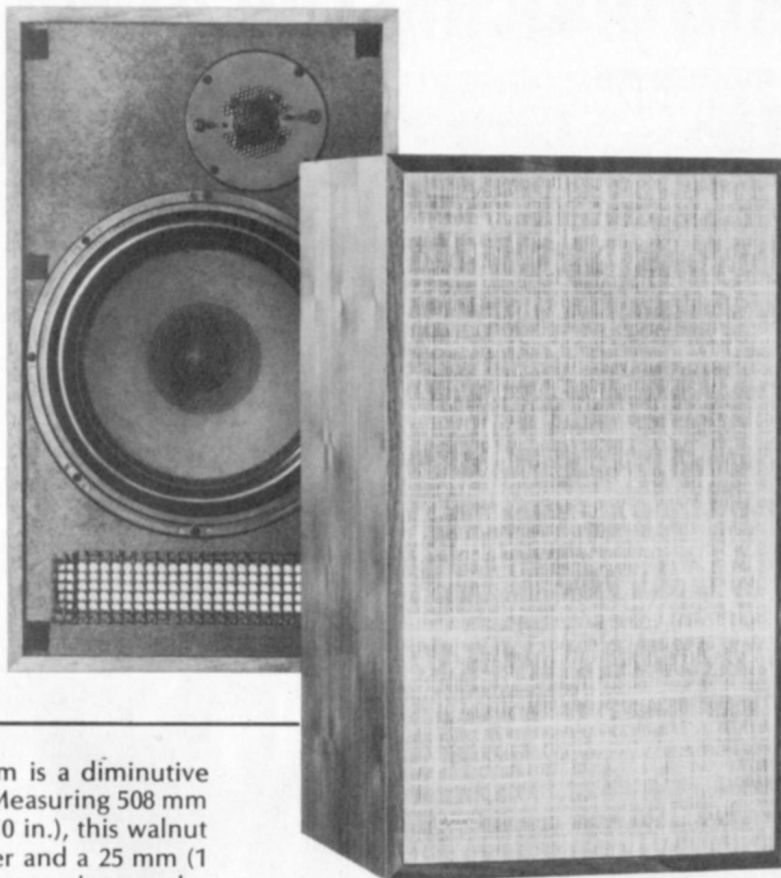
**Impedance:** 8-Ohms, nominal.

**Power Handling:** 50 Watts.

**Size:** 20-in. (50.8 cm) x 11 1/2-in.  
(29.2 cm) x 10-in. (25.4 cm).

**Weight:** 25 lbs. (11.34 kg).

**Price:** \$109.00.



The Dynaco A-25XL loudspeaker system is a diminutive reproducer that can fit almost anywhere. Measuring 508 mm (20 in.) by 292 mm (11.5 in.) by 254 mm (10 in.), this walnut enclosure houses a 254 mm (10 in.) woofer and a 25 mm (1 in.) non-rigid dome tweeter. Although the speaker can be placed on any bookshelf (it weighs only 11 kg (25 lbs.)), Dynaco provides wall brackets and screws for hanging the speaker directly on a wall.

The system is rated at 8 ohms and speaker connection is made to well-marked terminals in a recessed well on the rear of the enclosure. Also provided is a three-position, rotary tweeter level control with the center station marked *Normal*. Rotating the control adjusts the tweeter level a calibrated amount with clockwise rotation for increased tweeter output. A short but reasonably complete brochure accompanies each speak system so do-it-yourselfers should have no problems in hooking the system up.

### Technical Measurements

The magnitude of terminal impedance measured for the three rear-mounted switch positions of *Hi*, *Normal*, and *Low*

is shown in Fig. 1. The lowest impedance presented to a power amplifier occurs at near 7 kHz with the clockwise, or *Hi* switch position, and is approximately 5 ohms. This is a low enough value that I would recommend against connecting two A-25XLs in parallel if the *Hi* switch position is chosen.

The A-25XL is a vented cabinet with a high degree of acoustic damping in the vent. This gives the unusual looking low frequency tail on the bass resonance peak. The single bass resonance peak at 70 Hz is quite normal, as is the second resonance peak at 1200 Hz which is presumably due to the crossover network. But the subsidiary impedance peaks at 220 Hz and 560 Hz, and the dip at 7 kHz warrant some closer scrutiny.

The polar impedance plots for normal equalizer, and for clockwise, or high, control positions are shown in Figs. 2

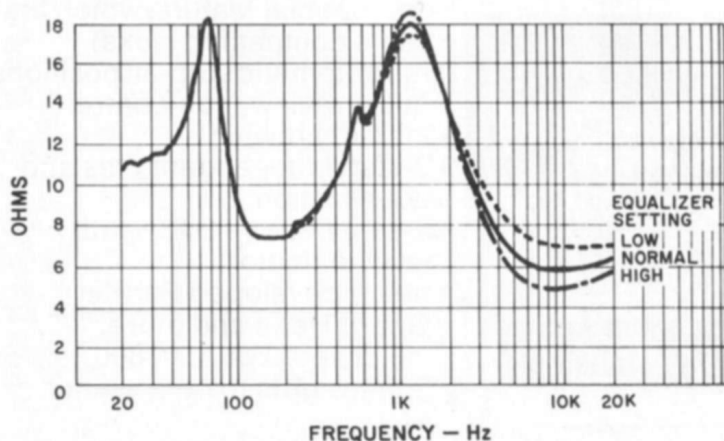


Fig. 1—Magnitude of terminal impedance for three positions of the equalizer.

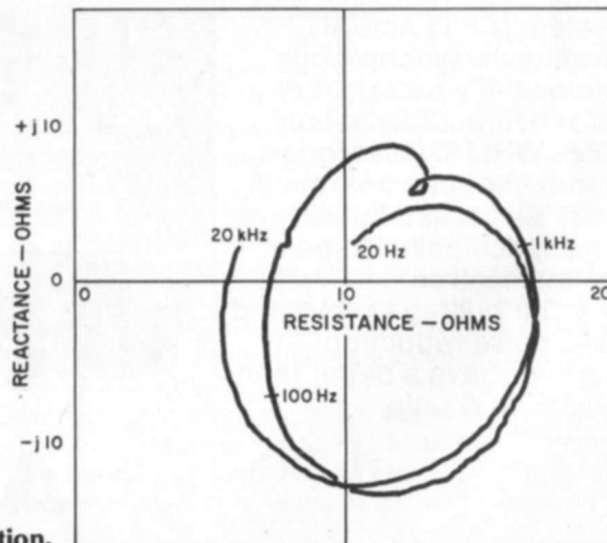


Fig. 2—Complex impedance for *Normal* equalizer position.

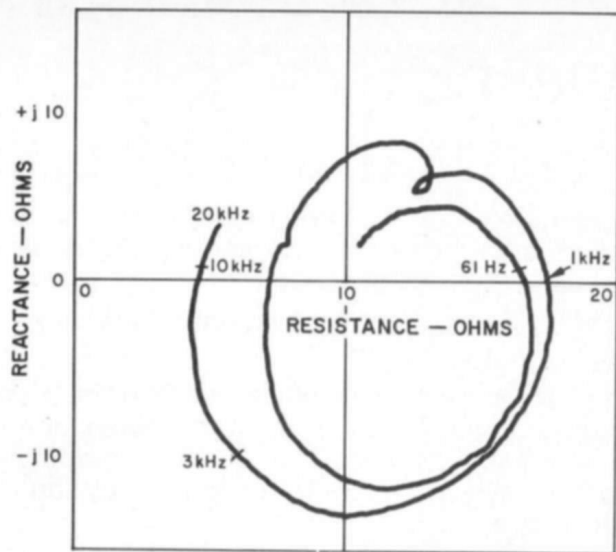


Fig. 3—Complex impedance for *High* equalizer position.

Fig. 4—One-meter, axial anechoic sound pressure at one-watt drive level.

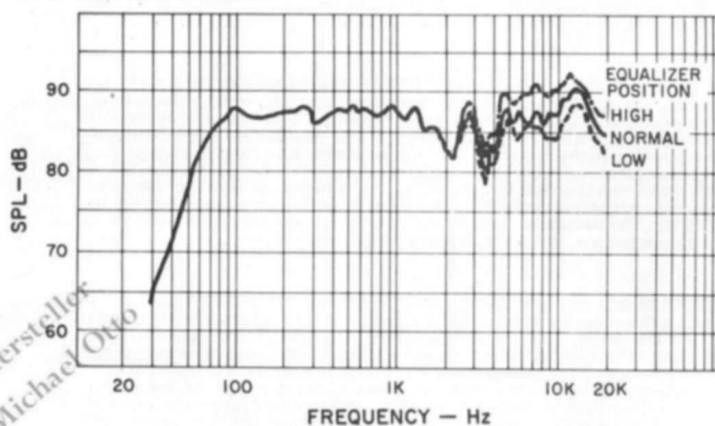


Fig. 5—One-meter, axial phase response with equalizer in *Normal* position.

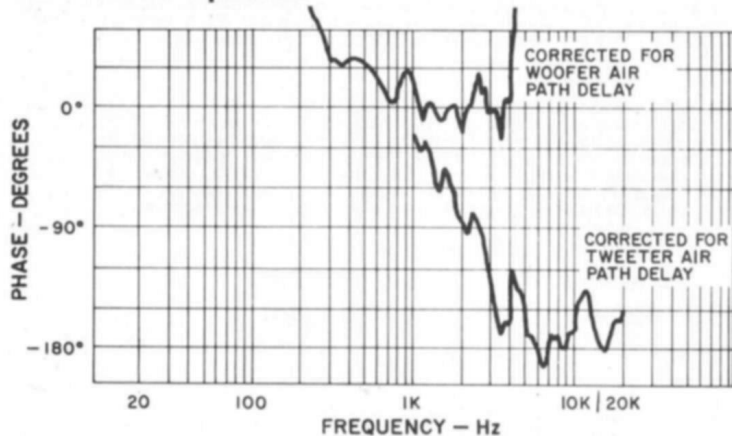
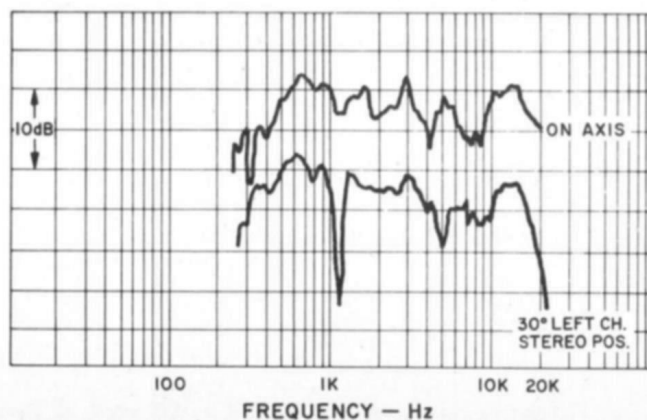


Fig. 6—Three-meter room response with equalizer in *Normal* position.



and 3. The 220 Hz and 560 Hz impedance variations are seen to be of little consequence to amplifier drive considerations, but the low value of impedance at high frequencies can cause difficulty for a few amplifiers. In Fig. 3, the worst case capacitive reactive load for a power amplifier is seen to occur at 3 kHz, where the impedance phase angle is nearly 45 degrees lagging.

In simple language, a certain few power amplifiers may audibly "crunch" when driving the A-25XL at high sound levels on program material with strong 3 kHz components, such as female vocals, when the equalizer is in its *Hi* position. This is because the reactive load line presented to output transistors may pass through regions of combined current and voltage for which protective circuitry or drive rate limitations cause amplifier distortion. Be careful, then, to use a good amplifier to power the Dynaco A-25XL if you want the cleanest transient performance possible with this system.

Figure 4 is a measurement of the one-meter, axial sound pressure level for one-watt average drive, assuming an 8-ohm nominal impedance. There is a very small bass resonance peak at around 100 Hz, but the low frequencies fall off in well-behaved fashion below 65 Hz. The response variations for each of the three tweeter control positions indicates that the actual acoustic crossover frequency lies more nearly at 4 kHz than at the 1.2 kHz cited by Dynaco.

This is verified in the phase plot for the normal control position as shown in Fig. 5. The acoustic position of the tweeter is 5 cm in front of the woofer and this necessitates the two phase measurements of Fig. 5, one measurement corrected for the air-path length between microphone and tweeter and the other corrected for the air-path length to the woofer.

These plots reveal that the sound pressure level goes out uniformly to 20 kHz. The sound from the tweeter arrives 0.15 milliseconds before the midrange sound from the woofer. While the tweeter portion of the spectrum is principally minimum phase, the polarity of tweeter sound is almost opposite to that of the woofer, clocking in at about 160 degrees relative to the woofer. This phase measurement means that a positive impulse applied to the speaker terminal will cause the tweeter response to have an initial pressure increase, then a swing toward a larger sound pressure decrease, rather than the ideal raised cosine pressure increase response of a perfect tweeter. While this may not have a noticeable effect on the sound from an A-25XL in all reproducing situations, it does indicate caution should be exercised if these speakers are to be mixed with other loudspeakers in stereo or quadraphonic listening situations.

The response of the Dynaco for the first 13 milliseconds of sound, when positioned 3 meters from a listener in a room with a 2.5 meter floor-to-ceiling height, is shown in Fig. 6. In this measurement the enclosure was placed against a wall and its long axis vertical. The height above floor was adjusted so that the tweeter was at the assumed ear level of 1 meter. Two measurements are shown in Fig. 6, three meters on axis and three meters in a 30-degree left-channel stereo listening position for the speaker. The equalizer was set to *Normal*.

There is a small peak in response in the 600 Hz range which will tend to make the midrange a bit prominent. The drop below 400 Hz may tend to give a thin sound but can be brought up with normal bass equalization.

The polar energy response for each of the three control positions is shown in Fig. 7 for the horizontal plane and in Fig. 8 for the vertical plane. In making these measurements there were two choices that could be made in cabinet con-

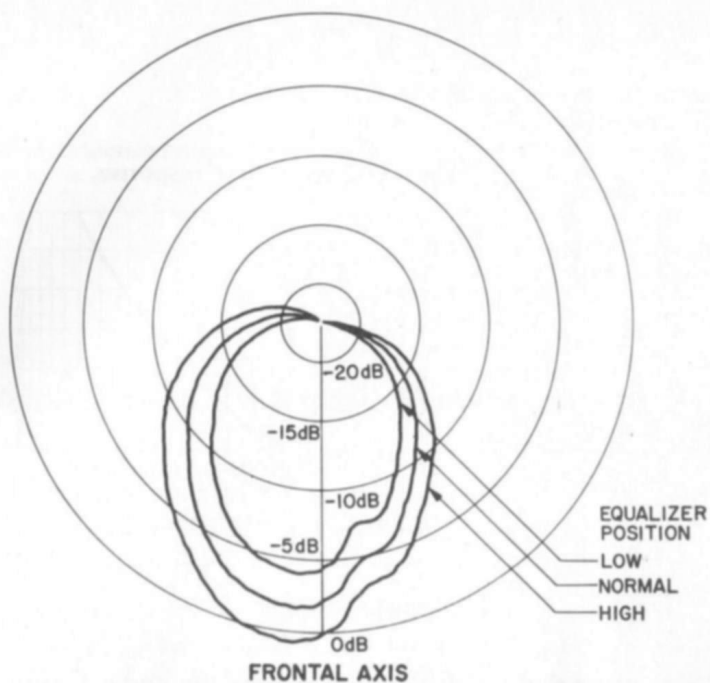


Fig. 7—Horizontal polar energy response (see text).

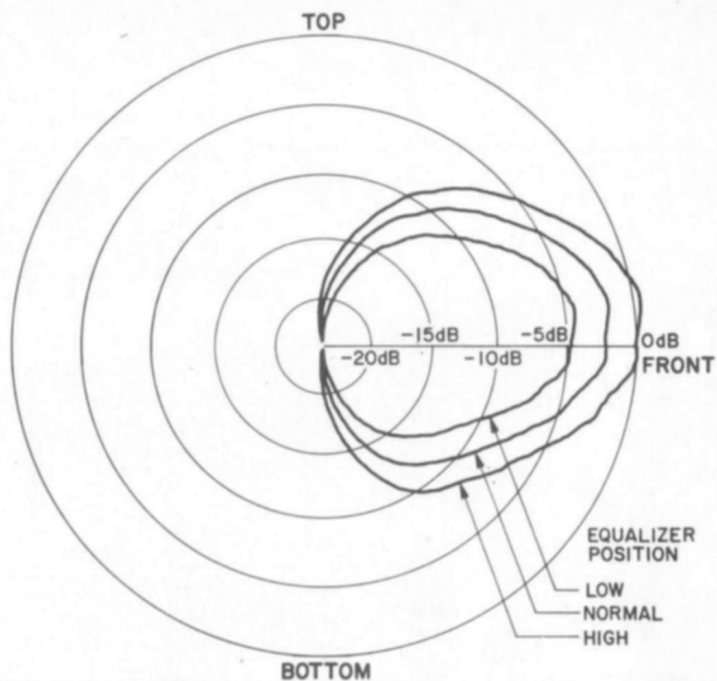


Fig. 8—Vertical polar energy response (see text).

figuration defining horizontal and vertical mounting. The grille-mounted logo appears erect when the long axis of the enclosure is vertical and the woofer lies below the tweeter. The rear labelling for control and terminal connection is erect when the long axis is horizontal and the tweeter is on the left as one faces the speaker. I chose this second, long axis horizontal, configuration to make this test.

The effect of the control is to give a 2.5 dB change in total sound energy in the 20 Hz to 20 kHz band. These plots indicate that polar dispersion is more uniform in the plane perpendicular to the long axis of the cabinet than in the plane containing the long axis. Therefore, these speakers should be mounted with their long axis vertical and with the Dynaco logo erect for best stereo sound. If they are mounted horizontally, as in the plots of these tests, the right channel will be stronger and brighter in timbre than the left channel unless both speakers are rotated toward the listening position.

Harmonic distortion for the musical tones E1 or 41 Hz, A2 or 110 Hz, and A4 or 440 Hz is shown in Fig. 9. As might be expected with such a small enclosure, E1 places a strain on the system, but the higher frequencies are reproduced with moderately low distortion. A very good sign, from the subjective standpoint, is that the distortion continues to drop with decreasing drive. The system should be rather clean sounding.

Intermodulation distortion on A4 or 440 Hz caused by E1 or 41.2 Hz mixed at equal level is shown in Fig. 10. A noteworthy characteristic is that the nature of this distortion is almost purely amplitude modulation. At 10 watts average drive, there is less than 1 degree peak-to-peak modulation of 440 Hz, and at 100 watts average drive there is only 3 degrees peak-to-peak phase modulation while there is 22 per cent peak-to-peak amplitude modulation.

The A-25XL handles the crescendo test moderately well for any drive within a 20-watt peak capability, but causes some compression above that level, verifying the results of the earlier listening test.

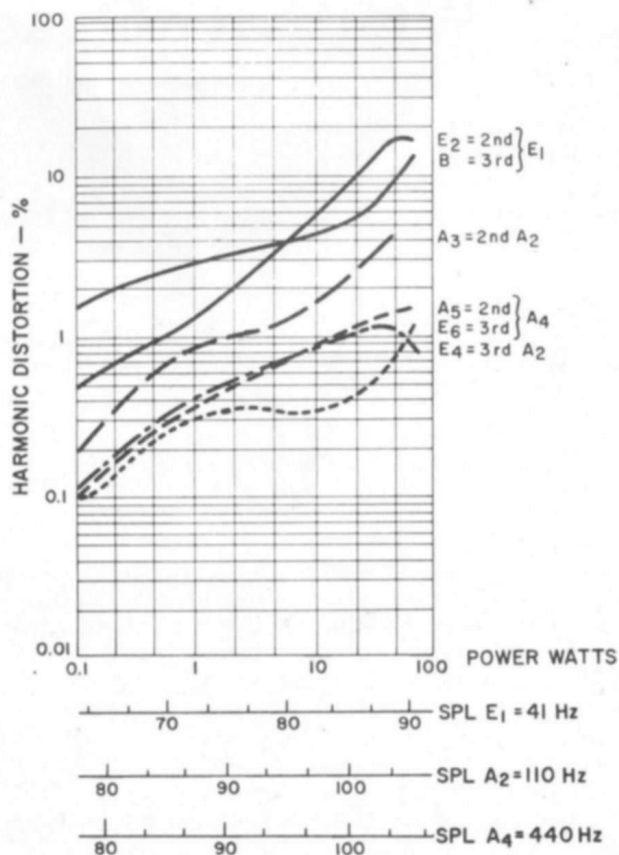
The energy-time test shown in Fig. 11 reveals a good primary tweeter peak at 3.05 milliseconds with a woofer energy contribution at 3.2 milliseconds, rapidly dropping below minor diffraction peaks at 3.6 milliseconds and 3.8 milliseconds. This is a good clustering of energy for the sharp tran-

sient sounds due to both tweeter and woofer. The notch at 3.12 milliseconds is due to the polarity reversal between the tweeter and woofer which causes a momentary cancellation.

### Listening Test

The Dynaco A-25XLs were mounted against a wall and three meters apart. Although Dynaco says that either hori-

Fig. 9—Harmonic distortion for the musical tones E1 or 41 Hz, A2 or 110 Hz, and A4 or 440 Hz.



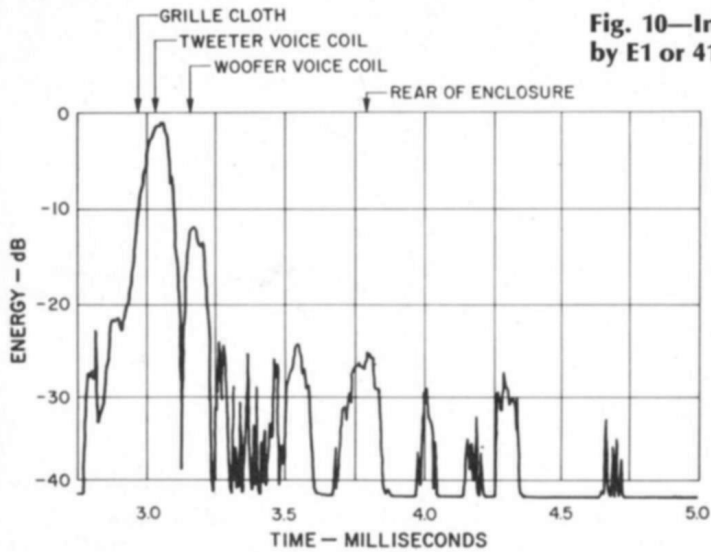


Fig. 10—Intermodulation distortion of A4 or 440 Hz by E1 or 41 Hz mixed one to one.

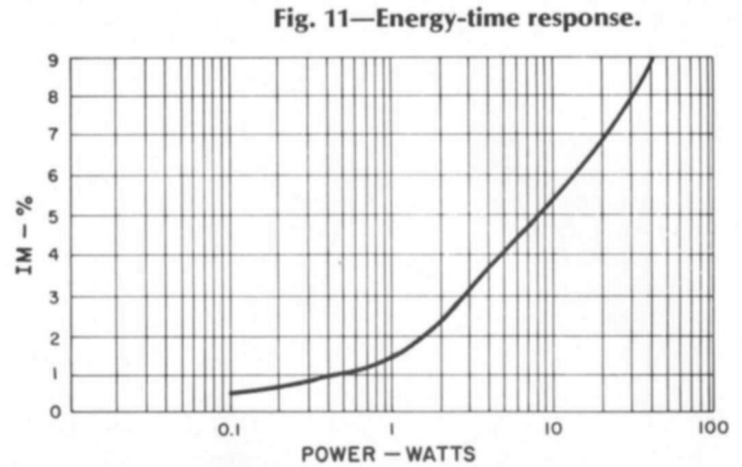


Fig. 11—Energy-time response.

zontal or vertical enclosure mounting is equally good, I found that I quickly preferred a mounting configuration with the long axis placed vertically.

My impression was of good spectral balance for stereo listening, but a mild polar fingering caused me to prefer rotating the enclosures slightly toward the listening area.

The A-25XLs are moderately efficient and can kick up quite a fuss with a reasonable amount of amplifier power. However, I had the subjective impression that the sound was ever so slightly compressed, not distorted, but just a bit compressed on dynamic peaks.

The super low frequencies are absent, and in my opinion

there was a slight midbass peak. But the top end is superb. High frequency transients are reproduced very cleanly. After extended listening, I found that I preferred the treble control in the *Low* position for symphonic music, while some vocals gave a more accurate sound with the *Normal*, or occasionally, the *High* equalizer position.

The reproduction of piano music is moderately good but I felt that it was a bit bright and somewhat compressed on strong dynamics. The stereo imagery is good in lateralization, and there is reasonable depth to the image. Not perfect, but quite good for the price. *Richard C. Heyser*

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