

L50 Competitive Product Comparison

By Mark Gander, Design Engineer

The realization of the design goals for the L50 three-way bookshelf loudspeaker system manifest themselves in exemplary measured performance, reinforcing the audible impression of smooth, accurate sound reproduction. There are many competitors in the marketplace, some quite popular, but objective measurement comparison reveals that while some manufacturers do one or two things well, only the quality, craftsmanship, and engineering expertise of JBL provides a balanced integration of all the elements for the best total performance. "Get It All" is not just a slogan, it is a design philosophy.

Response data taken in an anechoic environment, a special measurement chamber in which all mid- and high-frequency energy produced by the speaker is absorbed without being reflected back to the measurement position, can reveal much about the performance characteristics of a speaker system. While it is true that we listen in normal rooms, with various types of reflective and absorptive surfaces, the sound energy output must come from the speaker system, which can only be degraded by the room's affects.

Figure 1 shows the anechoic amplitude and acoustic phase response of an L50 system from 400 Hz to 20 kHz. The amplitude response (commonly referred to as the frequency response) is very smooth and essentially flat, and the phase is similarly smooth, devoid of sharp breaks of discontinuities which would indicate time delay distortions. JBL has been continually concerned with the importance of acoustic phase, but only as one of the many important elements in total system performance.

Figure 2 shows a similar curve and also dispersion curves on axis, at 15° , and 30° , in the horizontal plane showing the consistency of response throughout the angles covering listening area, yielding accurate stereo imaging and perspective.

Figures 3 and 4 are similar curves taken on an Infinity Qb system. Efficiency is comparable, although slightly lower, but frequency response suffers a raggedness at the upper crossover transition. This is caused partially by the skewed arrangement of transducers on the baffle, and partially by a time

delay problem between the mid-range and tweeter, as evidenced by the sharp discontinuity in the phase response. The horizontal dispersion also witnesses this problem as variations in the response with listening angle.

Figure 5 shows the amplitude and phase of the Technics SB-5000a system. The amplitude is fairly smooth and the phase is quite flat, as claimed ... at one point in space. Figure 6 shows the response variations at different points on axis and across the horizontal plane. Only at one spot is the response perfect; at other points reflective cancellations due to the sharp stepped baffle surfaces cause frequency response aberrations. Additionally the tweeter dispersion is not very good, rolling off rapidly off axis.

Figure 7 shows the response of a Bose 601 loudspeaker. Obviously, by most criteria this system is not a strong performer, both the amplitude and phase being very choppy and uneven. Bose relies on the room reflections, random though they may be, to create the illusion of hi-fidelity, and though the energy output is somewhat uniform, an accurate sound can hardly be the result.

Figure 8 shows the total amplitude response and impedance characteristic of the L50 and AR 12 systems as measured in a large flat baffle. Both systems are very similar in response and sensitivity (efficiency), except for a slightly weak tweeter on the AR. The interesting comparison is shown in Figure 9.

While both systems have similar low end responses, the AR12 is a sealed or acoustic suspension system, while the L50 uses the vented-box principle to extend the bass with lower distortion. At the same drive level, in this case 10 W, the vented L50 produces its output with only 1% distortion at 40 Hz, while the sealed AR12 is producing something on the order of 15% distortion, severe doubling and inaccurate reproduction. This is a graphic demonstration of the advantages of proper application of the vented box principle.

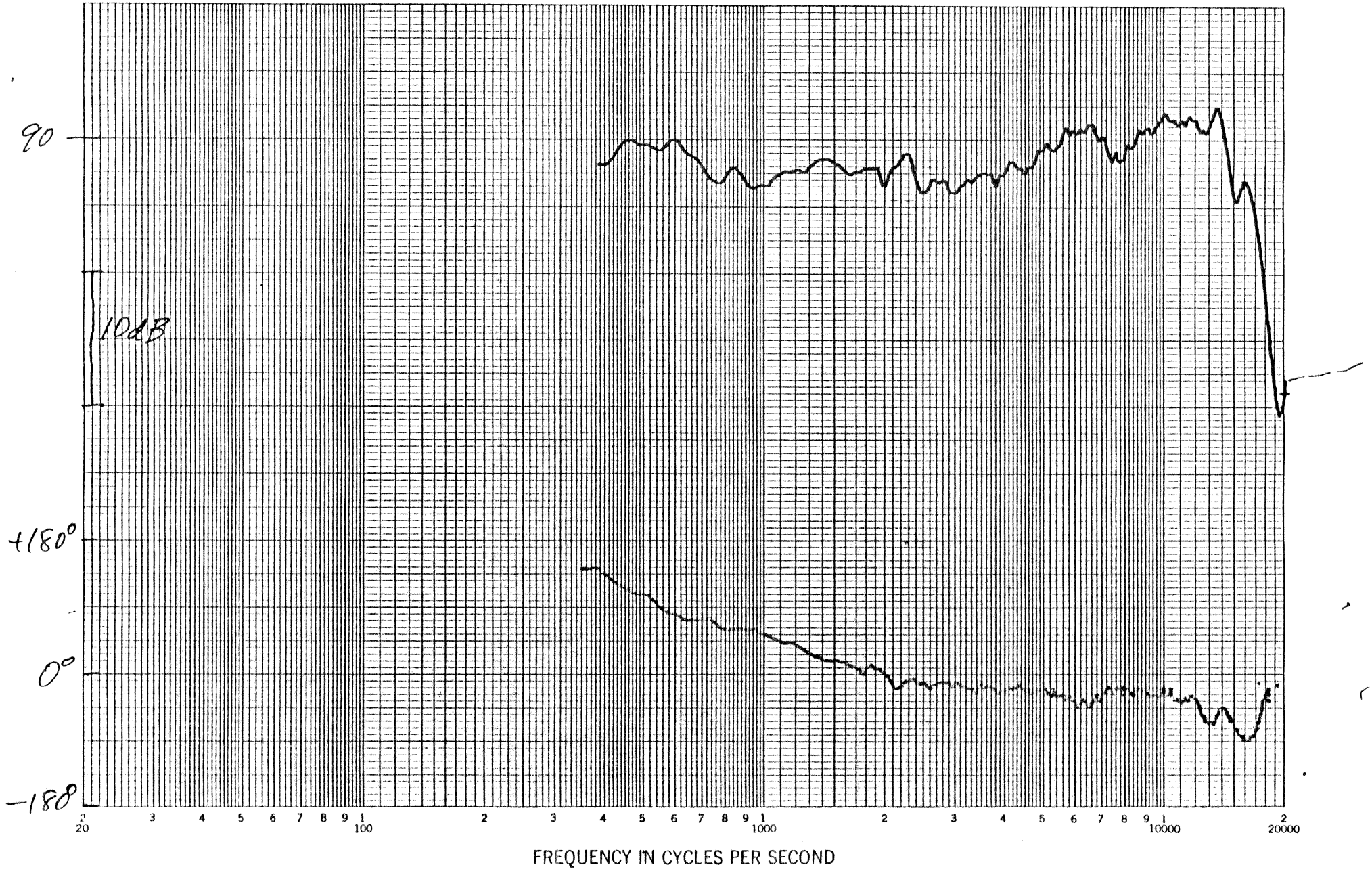
So here are a number of popular systems, all of which sell well, each of which does a few things well, but only the L50 does it all. Only the JBL philosophy can bring you not just one single feature or selling point, but the full engineering perspective, drawing on years of experience in professional,

studio, musical as well as hi-fi sound, the quality of manufacturing and craftsmanship that insures that you are getting a complete product that will provide years of pleasurable listening.

Get it all. JBL.

L50 STANDARD
28V @ 1m

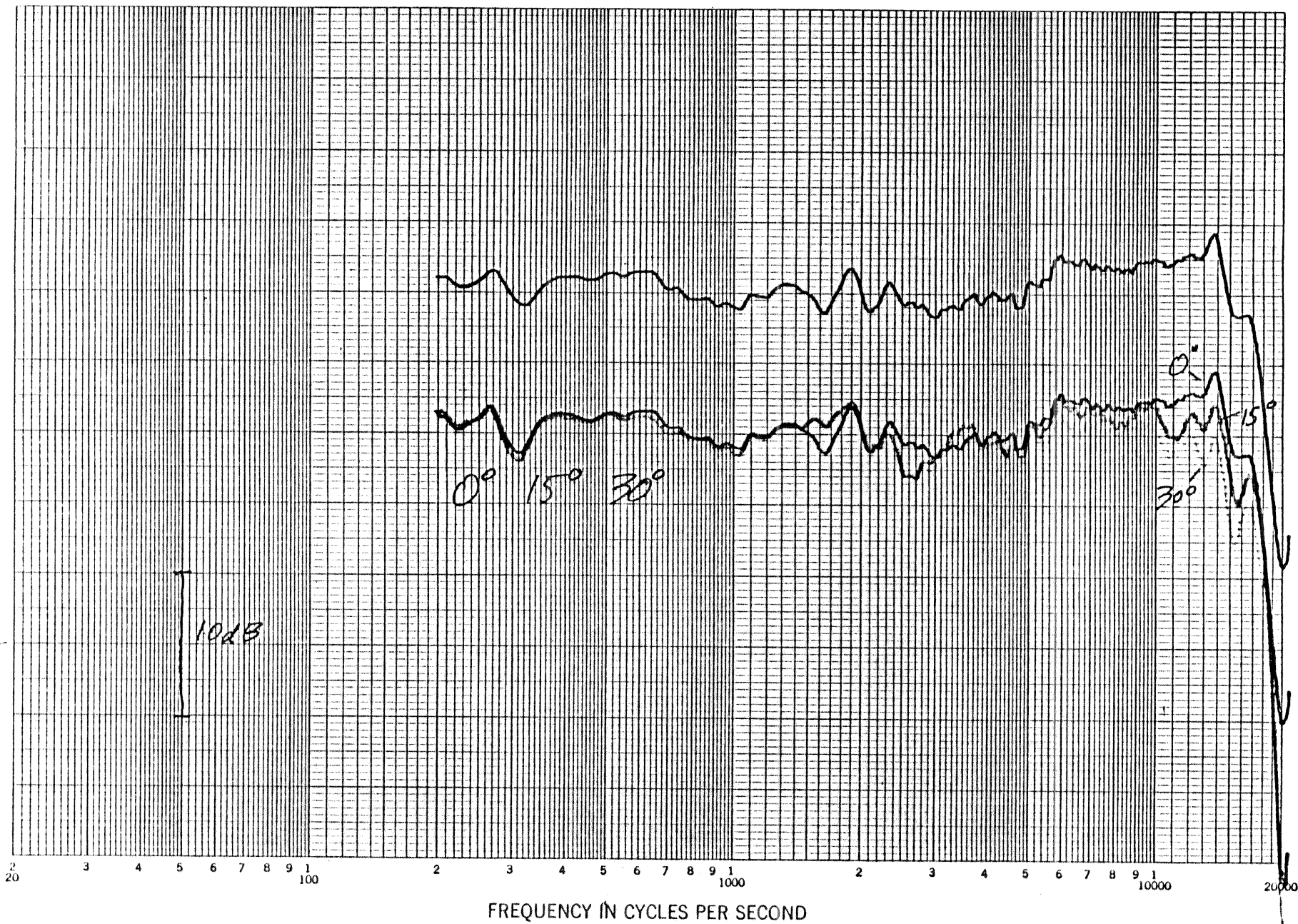
FIGURE 1



L50 s/n 10010

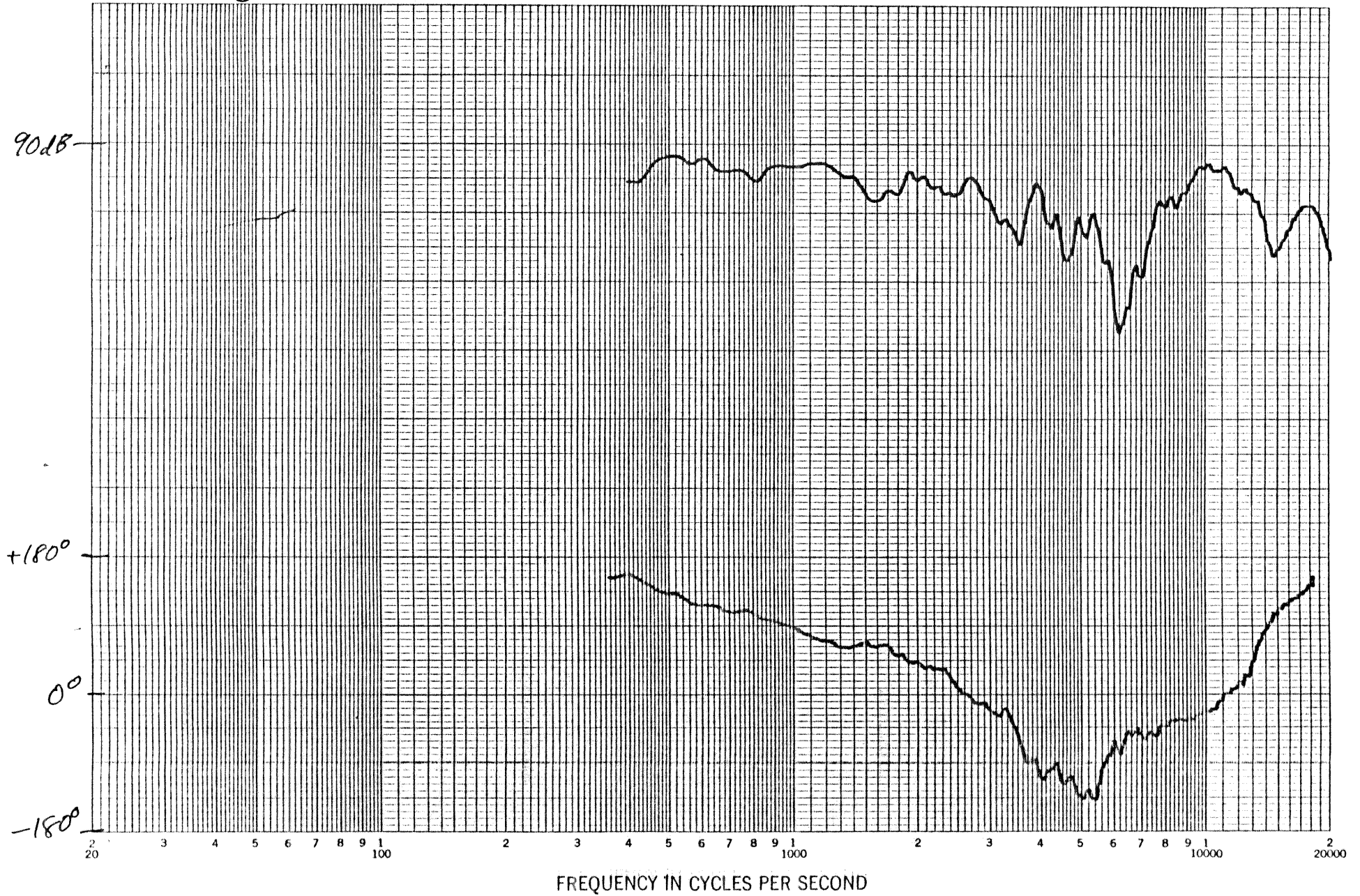
FIGURE 2

CHARTER 1m



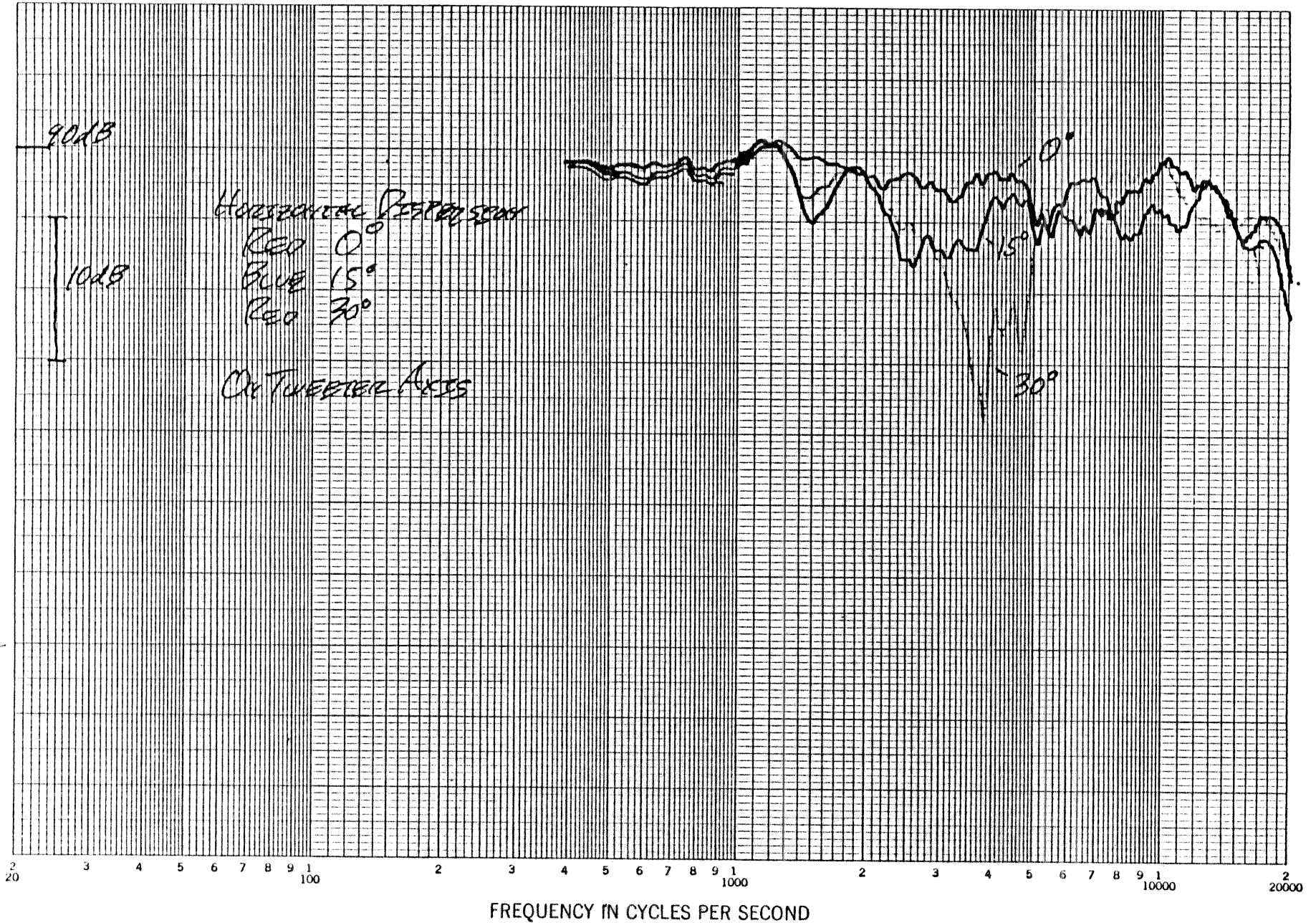
INFINITY Qb
SN P108109
2.8 V @ 1m

FIGURE 3



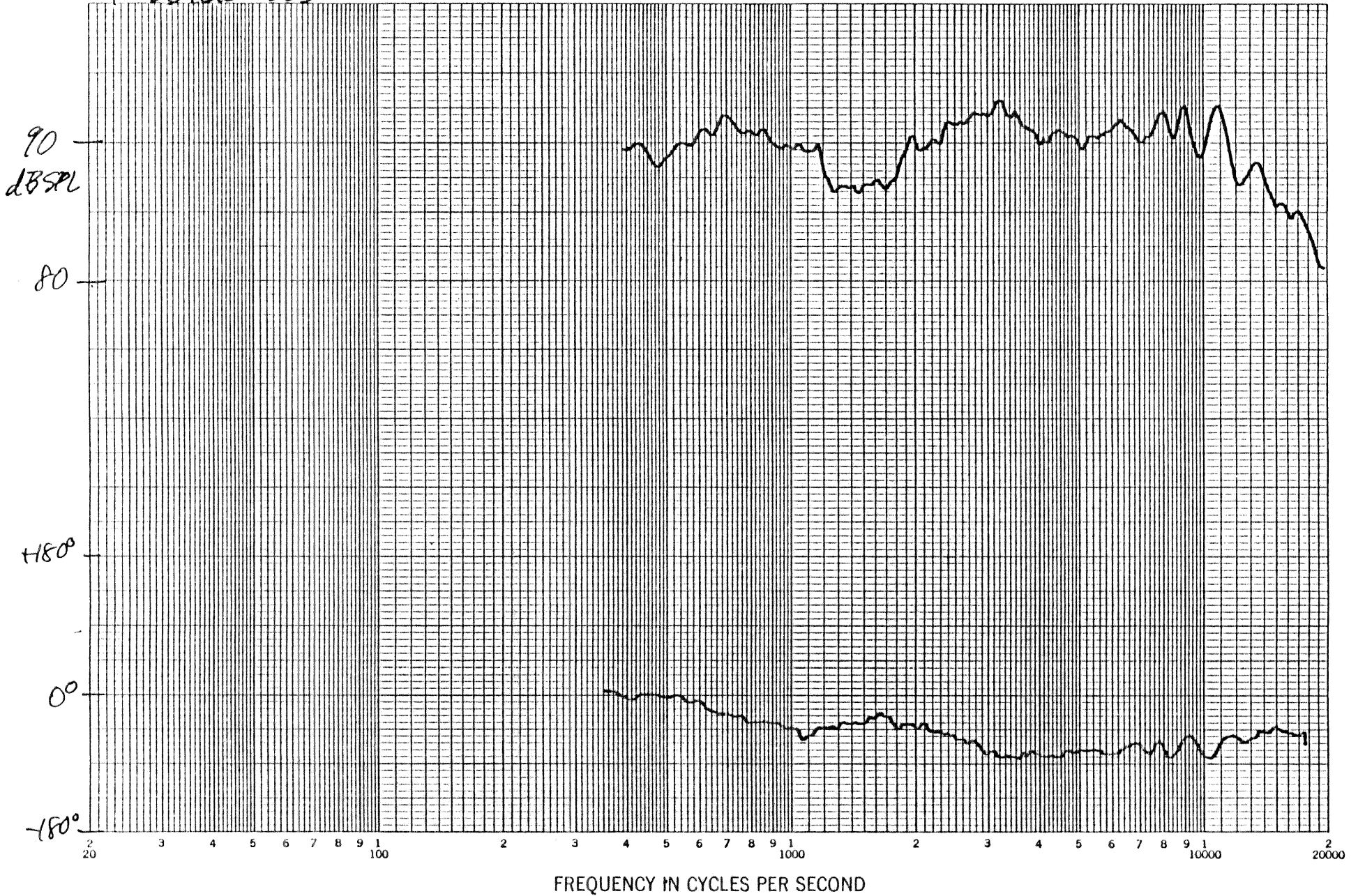
INFINITY Qb
S/N 8108109
2.83 V @ 1m

FIGURE 4



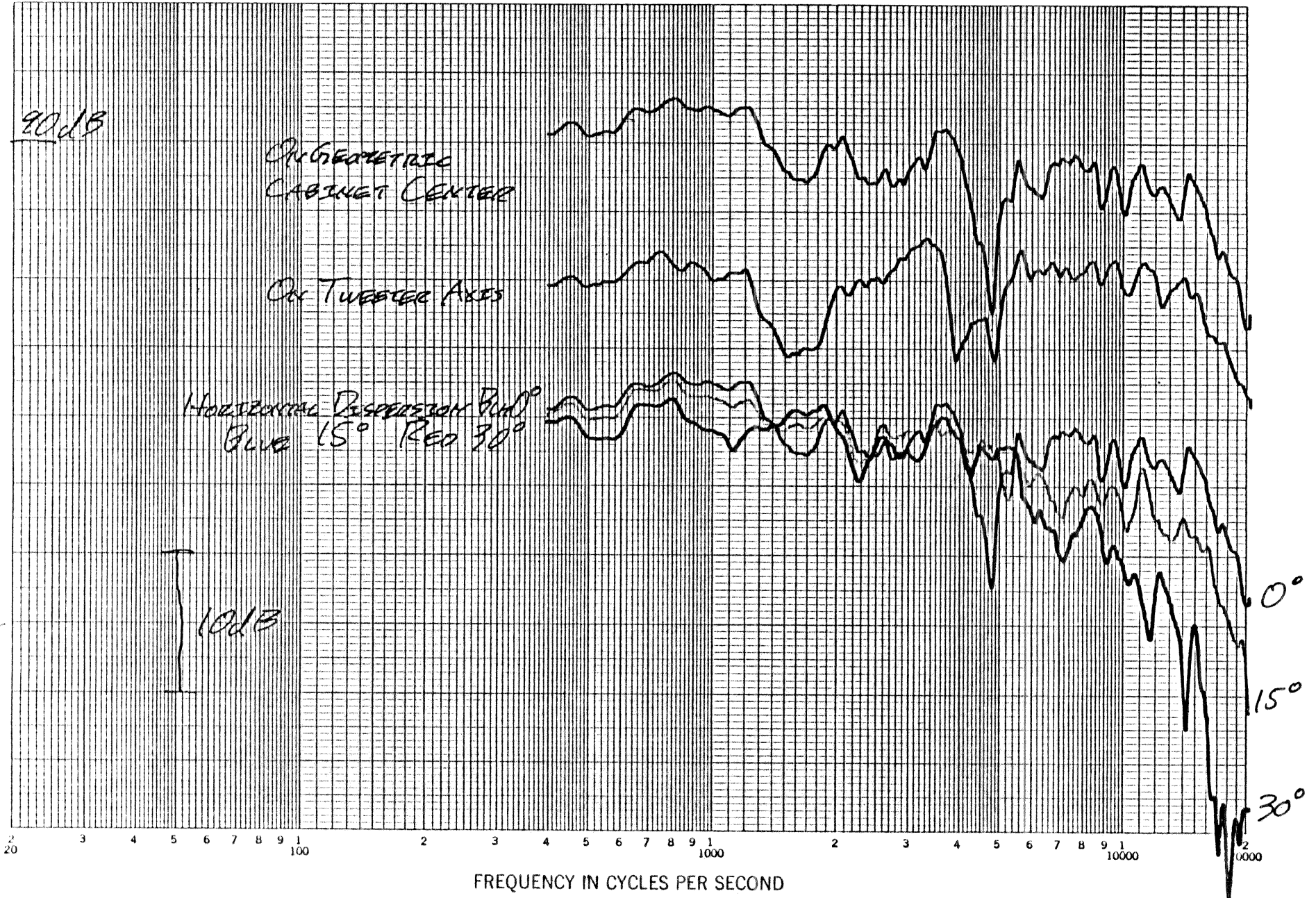
TECHNICALS SB-5000A
2.83V @ 1m
TWEETER AXES

FIGURE 5



~~TECHNICAL~~ SB-5000A
2.83 V @ 1m

FIGURE 6



Bose 601
S/N 16776
PART 1 - LEFT

2.8 V @ 1 m

FIGURE 7

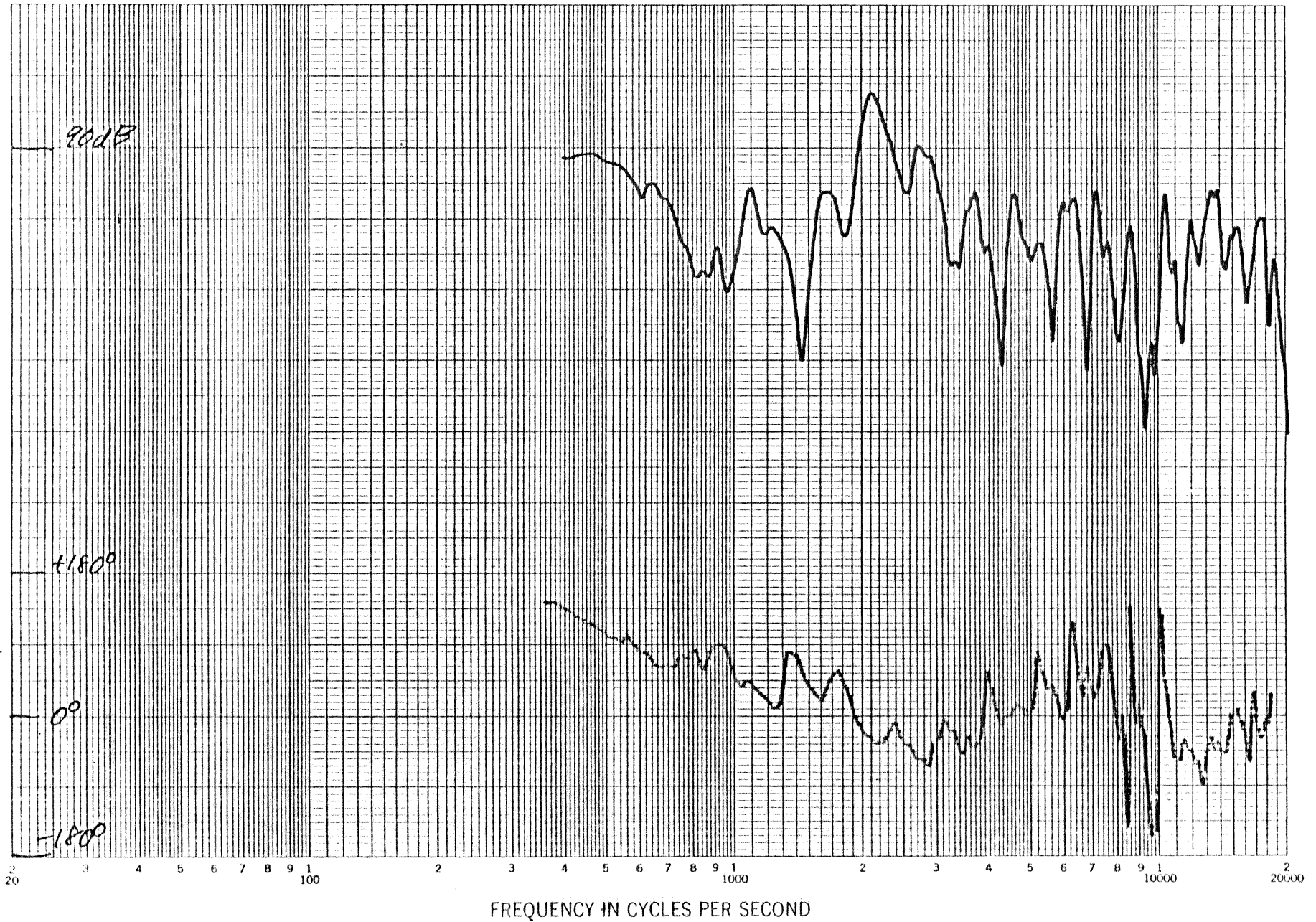


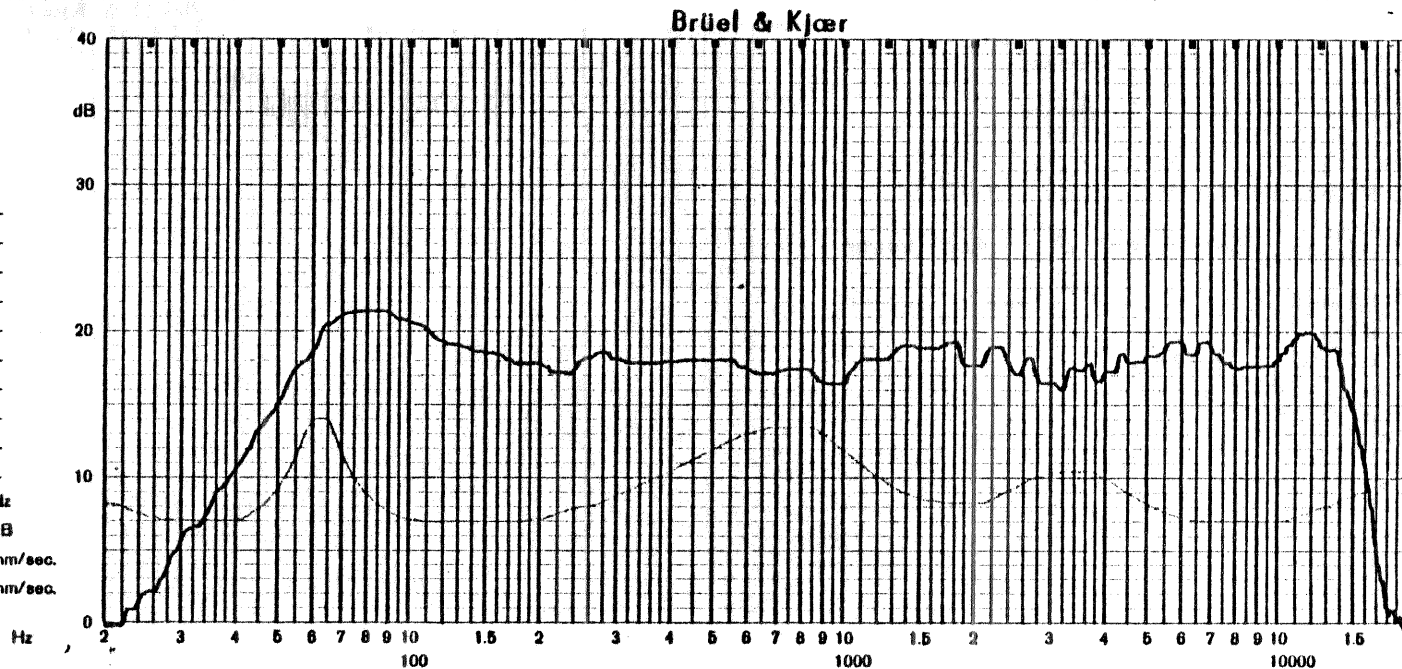
FIGURE 8

Brüel & Kjær
Copenhagen



Measuring Object: LSO s/n 10010
Controls At Max Rotation ("5")
1W @ 1m
6.27 @ 150 Hz \Rightarrow 2.49 Volts
Mic On Geometric Profile Center Axis
 Rec. Nr.: B&K I HALF SPACE
 Date: FEBRUARY 28 1978
 Signature: M. A. [Signature]
 Rectifier: RMS
 Zero Level: 70dB
 Lower Lim. Frequency: 10 Hz
 Potentiometer Range: 40 dB
 Writing Speed: 80 mm/sec.
 Paper Speed: 3 mm/sec.

QP 1125



Brüel & Kjær
Copenhagen



Measuring Object: AR12 s/n C11681
Mid And High Control At 0dB
1W @ 1m \Rightarrow 2.66 Volts
7.17 @ 100 Hz 3.72 @ 5 kHz
Mic On Geometric Profile Center Axis
 Rec. Nr.: B&K I HALF SPACE
 Date: APRIL 21 1978
 Signature: M. A. [Signature]
 Rectifier: RMS
 Zero Level: 70dB
 Lower Lim. Frequency: 10 Hz
 Potentiometer Range: 40 dB
 Writing Speed: 80 mm/sec.
 Paper Speed: 3 mm/sec.

QP 1125

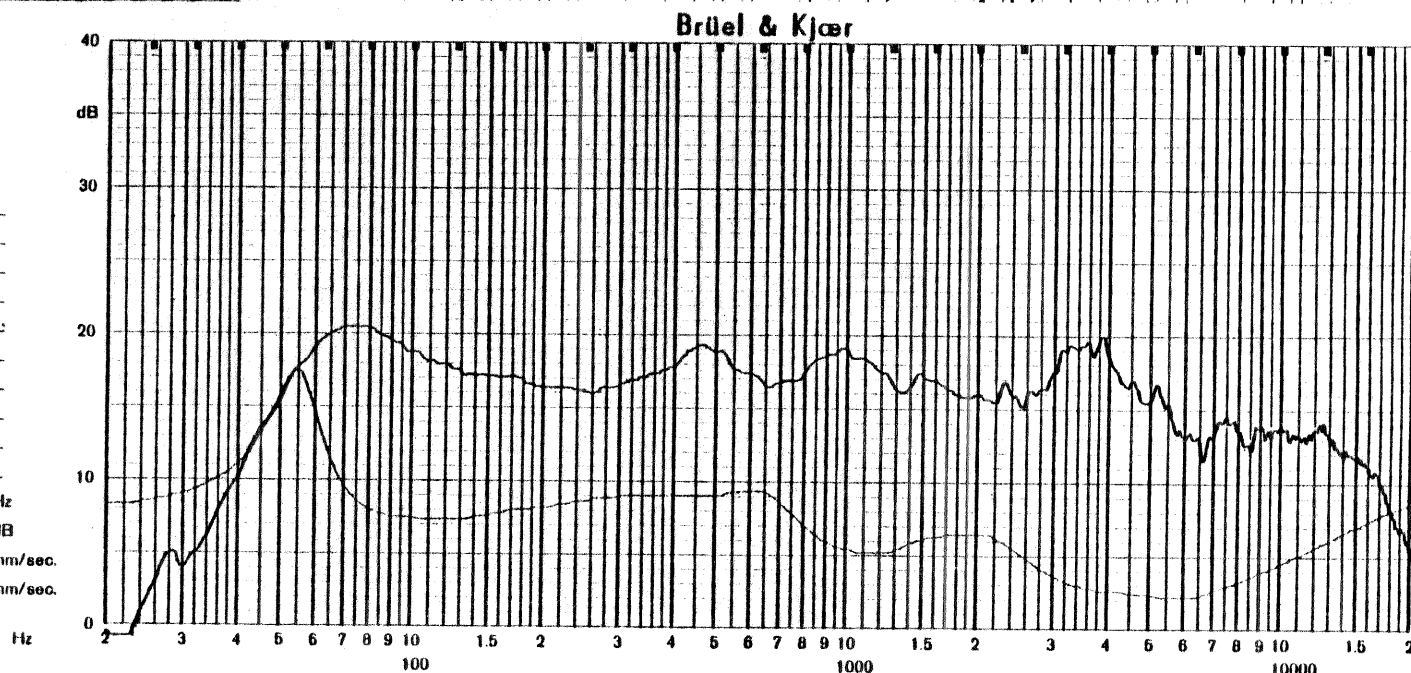


FIGURE 9

Brüel & Kjær
Copenhagen



Measuring Object: L50 s/n 10010

10 W NEARFIELD 6" 8.94 VOLTS

HARMONIC DISTORTION +20dB REF 2nd GREN 300

Rec. Nr.: B&K1

Date: APRIL 14, 1978

Signature: M. N. Jørgensen

Rectifier: RMS

Zero Level: —

Lower Lim. Frequency: 10 Hz

Potentiometer Range: 40 dB

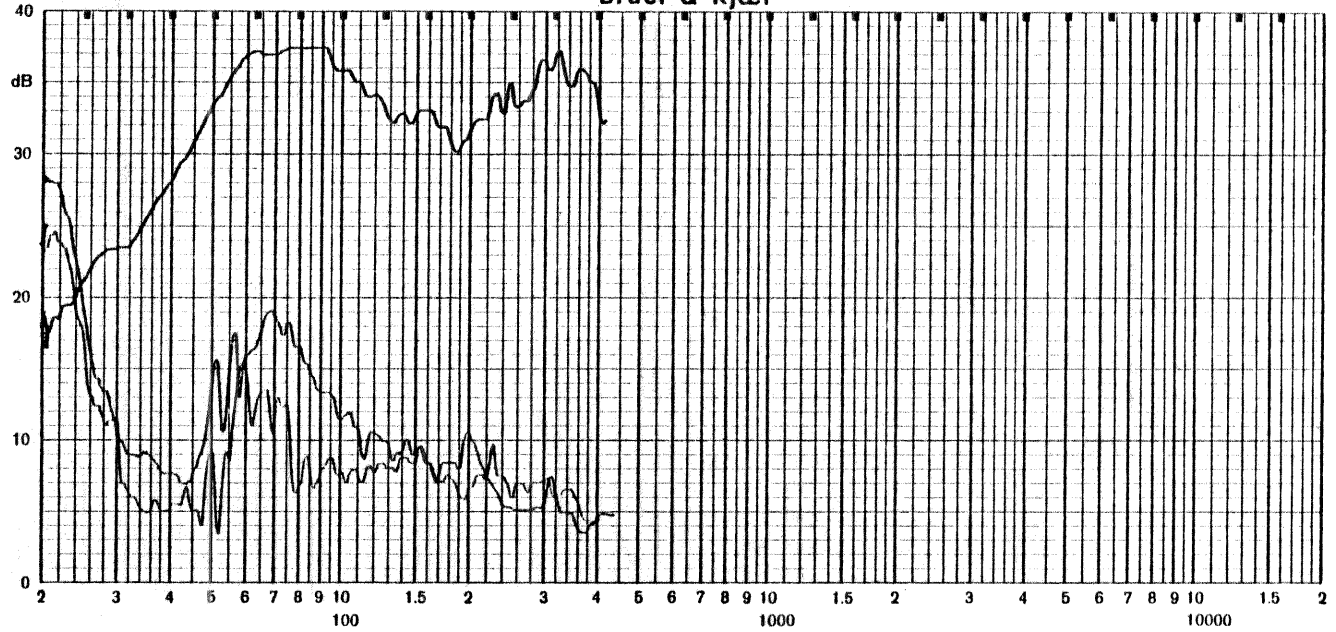
Writing Speed: 31.5 mm/sec.

Paper Speed: 3 mm/sec.

QP 1125

Hz

Brüel & Kjær



Brüel & Kjær
Copenhagen



Measuring Object: AR 12 s/n C11681

10 W NEARFIELD 6" 8.94 VOLTS

HARMONIC DISTORTION +20dB REF 2nd GREN 300

Rec. Nr.: B&K1

Date: APRIL 14, 1978

Signature: M. N. Jørgensen

Rectifier: RMS

Zero Level: —

Lower Lim. Frequency: 10 Hz

Potentiometer Range: 40 dB

Writing Speed: 31.5 mm/sec.

Paper Speed: 3 mm/sec.

QP 1125

Hz

Brüel & Kjær

