

MARTIN MAC One

Acoustic Test Report



Martin

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Title

MARTIN MAC One Acoustic Test Report

Test conditions

Test carried out according to ISO 3744:2010(E)

Device tested.

Make: HARMAN Professional Denmark ApS

Model: MAC One

Serial no: 00000000021

Software version: V1.0.0

Results

An image of the test setup can be found on Page 3. Test results are listed in Table 1 on Page 5. Figures of measurement results are shown in Appendix A on Page 6.

HARMAN Professional Denmark ApS, R&D QA are responsible for the test results given in this report.

Environment

Temperature: $23.5 \pm 1^\circ\text{C}$ Ta

Humidity: 55 %RH

AC mains power: 230 V, 50 Hz

Background noise level: <16.3 dBA

Warm-up time: 30 minutes at each test scenario till fixture heat stable.

Fixture placement: Fixture was placed at least one meter from walls and ceiling, as described in the Standard ISO 3744:2010(E)

Remarks

Test results apply only to the tested specimen.

Rev: (last five)	Made by:	Description:	Approved by:	Date approved:
A	Guo, Kevin	MAC One noise level Measurement	Andreasen, Michael	2023-11-29
B	Guo, Kevin	Adding 2 more fan mode measurement results into report.	Andreasen, Michael	2024-01-12

Setup

The product was placed indoors in a semi-anechoic room in the internal Lab of Harman Technology in Shenzhen, China (See Figure 1). The main dimensions of the room were 5.9m * 4.9m * 3.3m (length * width * height).



Figure 1: Test setup

The product was allowed a minimum 30 minutes of warm-up time before measurements were performed.

Measurement method

Measurements were carried out using a setup with 1 microphone. The microphone was in turn moved to the measurement positions described below.

Measurement setup at hemispherical measurement model, as figure 2

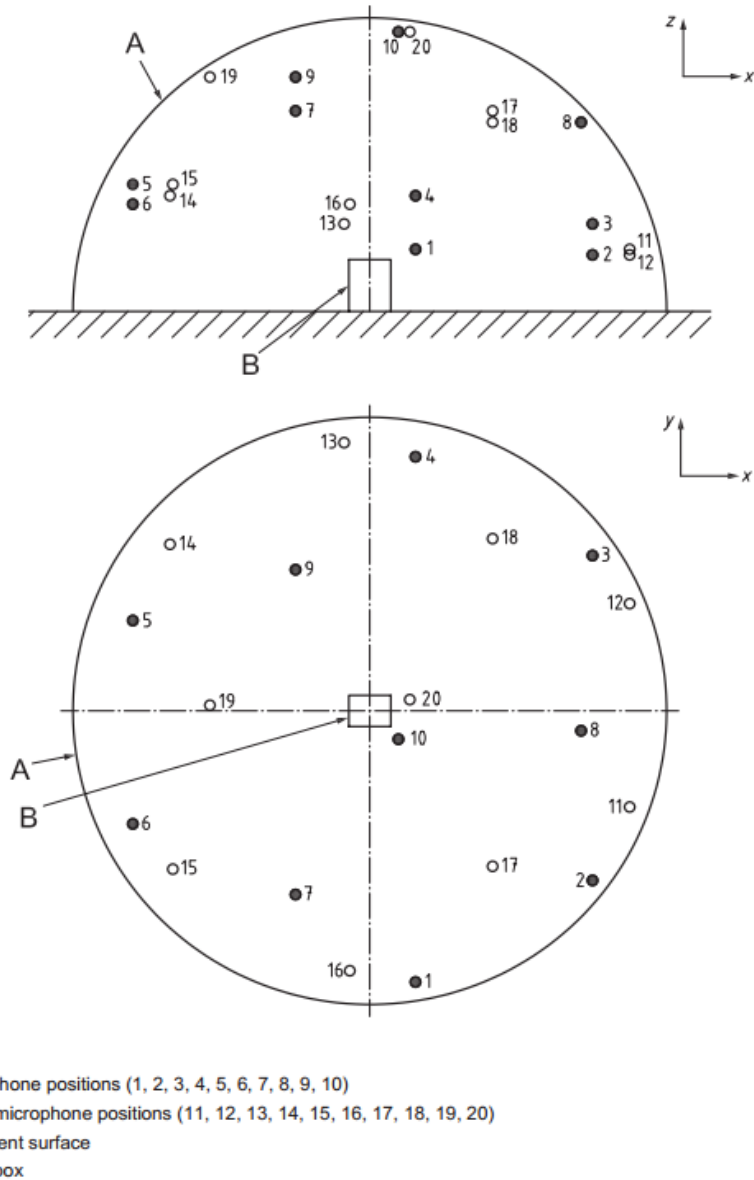


Figure 2: Microphone Positions

Note:

1. $R=1.5\text{m}$.
2. $S=2\pi R^2$, Measurement surface area: 14.14 m^2 .
3. 10 key microphones were taken measurement, as the range of A-weighted sound pressure levels measured at position 1 to 10 does not exceed 10 dB, additional 11 to 20 can be not considered.
4. The dimensions of the reference box (L: W: H): $22.5\text{ cm} \times 26.0\text{ cm} \times 29.5\text{ cm}$.

Results

The MAC One was measured in below 5 different scenarios:

1. All effects static, Light source ON, 100% output white light - Regulated Fan.
2. All effects static, Light source ON, 100% output white light - Constant Fan Full.
3. All effects static, Light source ON, 100% output white light - Constant Fan Mid.
4. All effects static, Light source ON, 100% output white light - Constant Fan Low.
5. All effects static, Light source ON, 100% output white light - Constant Fan U-Low.

With head horizontal as "Figure 1" show.

Measured sound pressure levels results are shown in Table 1.

Distance from fixture	Regulated Fan [dBA]	Constant Fan Full [dBA]	Constant Fan Mid [dBA]	Constant Fan Low[dBA]	Constant Fan U-Low[dBA]
LpA at 0m	34.3	55.8	51.4	39.3	31.0
LpA at 1m	26.3	47.8	43.4	31.3	23.0
LpA at 4m	14.3	35.8	31.4	19.3	11.0
LpA at 7m	9.4	30.9	26.5	14.4	6.1

Table 1: Sound Pressure Levels

The duration of the acoustical measurement for each position is 10s.

Sound Pressure Levels have been converted from Sound Power Levels using the formula: $LpA = (LwA - \text{reduction distance})$

Reductions used: 8dB(A)@1m, 20dB(A)@4m, 24.9dB(A)@7m.

Instrumentation

Test equipment list:

Equipment	Maker	Type
Harman	NTi Audio	NTi XL2 A2A-14709-E0
Harman	NTi Audio	MIC MA220 No.7587
Harman		Semi-anechoic room
Harman		Digital Barometer
Harman		Data logger for atmosphere & environment

Table 3: Instruments Used

