

MAC Aura XIP

Acoustic Test Report



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Title

MAC Aura XIP Acoustic Test Report

Test conditions

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

Device tested

Make: HARMAN Professional Denmark ApS

Model: MAC Aura XIP

Serial no: 15068044826

Software version: 1.0.0

Results

An image of the test setup can be found on Page 4. Test results are listed in Table 1 on Page 6. Figures of measurement results are shown in Appendix A on Page 8.

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

Environment

Temperature: 30°C Ta

Humidity: 60 %RH

AC mains power: 230 V, 50 Hz

Background noise level: 16.3dBA

Warm-up time: 30 minutes at full intensity.

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	Dana Yang	MAC Aura XIP Sound Measurement	Verlinden Wouter	2022-09-05

Setup

The product was placed indoors in a semi-anechoic room in the external Lab of Harman Technology in Shenzhen, China (See Figure 1). The ceiling and walls were all acoustically absorbent and the floor was reflective. The main dimensions of the room were 5.9m * 4.9m * 3.3m (length * width * height).

HARMAN Professional Denmark ApS



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 Fixture 2

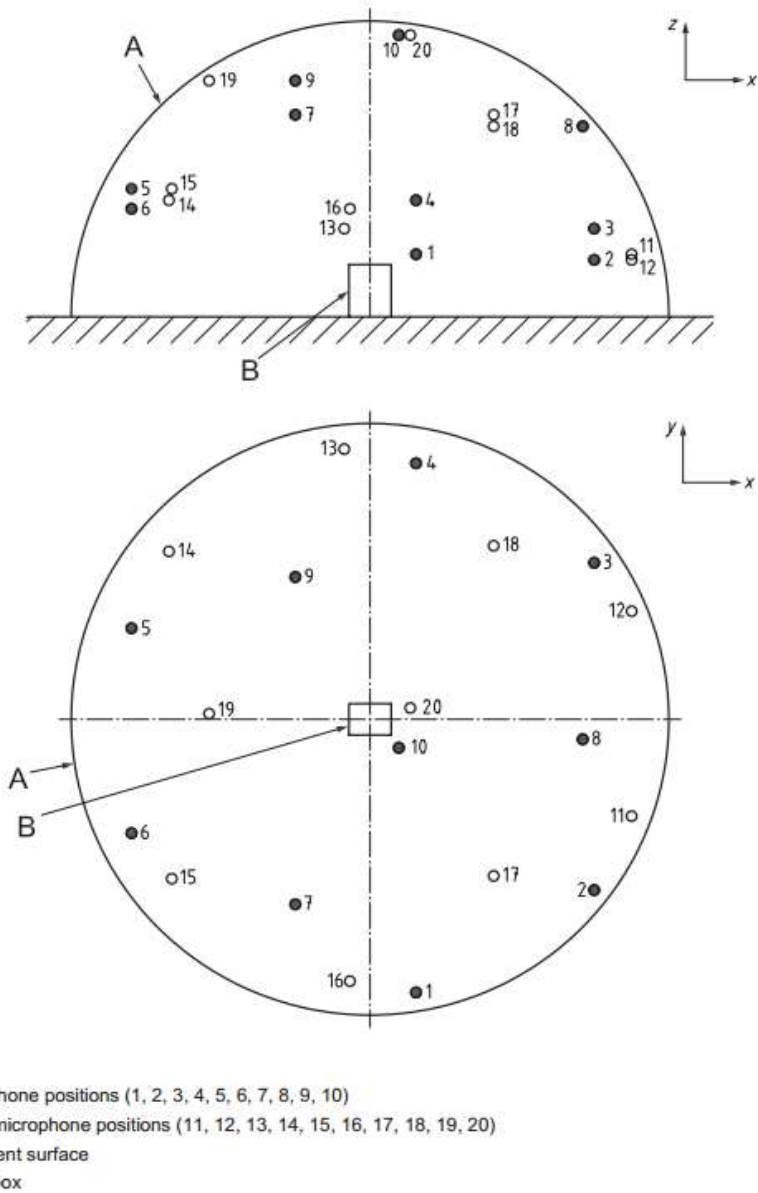


Figure 2: Microphone Positions

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: 33.8 cm x 30.7 cm x 38 cm.

Instrumentation

Please refer to Page 8 for a full instrumentation list.

Results

The MAC Aura XIP was measured in 5 different scenarios:

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

Test positions and sound pressure levels are shown in Table 1.

Sound Pressure Levels					
Distance from fixture	Regulated Fan (Max Output) [dB(A)]	Constant Fan Full [dB(A)]	Constant Fan Mid [dB(A)]	Constant Fan Low [dB(A)]	Constant Fan Ultra-Low [dB(A)]
LpA at 0m	42.4	51	46.8	39.7	33.2
LpA at 1m	34.4	43	38.8	31.7	25.2
LpA at 4m	22.4	31	26.8	19.7	13.2
LpA at 7m	17.5	26.1	21.9	14.8	8.3

The duration of the acoustical measurement for each position is 30s.

After calculated the time-averaged sound pressure levels of all positions and background noise, the difference between the two values is more than 15dB, therefore no correction for background noise shall be applied.

Table 1: Sound Pressure Levels

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

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

Noise level details

Appendix A displays measurement detail of noise level in Regulated Fan Mode scenario.

Instrumentation

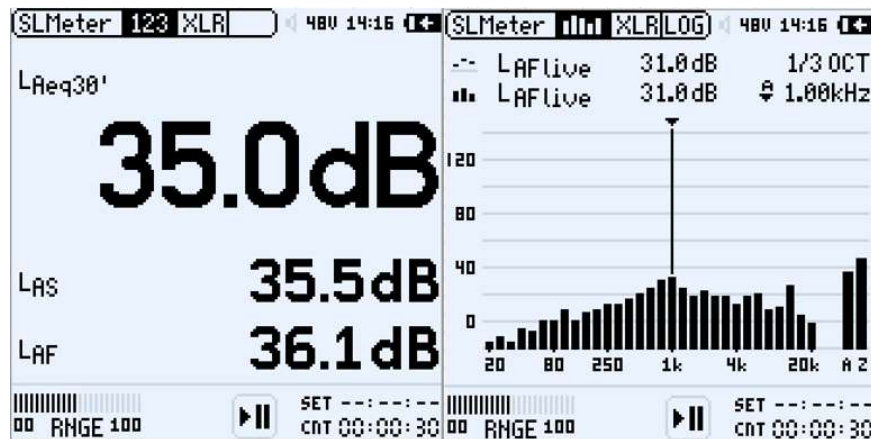
Equipment	Maker	Type
Harman	NTi Audio	NTi XL2 A2A-14709-E0
Harman	NTi Audio	MIC MA220 No.7587
Harman		Semi-anechoic room
Harman		Digital Barometer
Harman		Data logger for atmosphere & environment

Table 2: Instruments Used

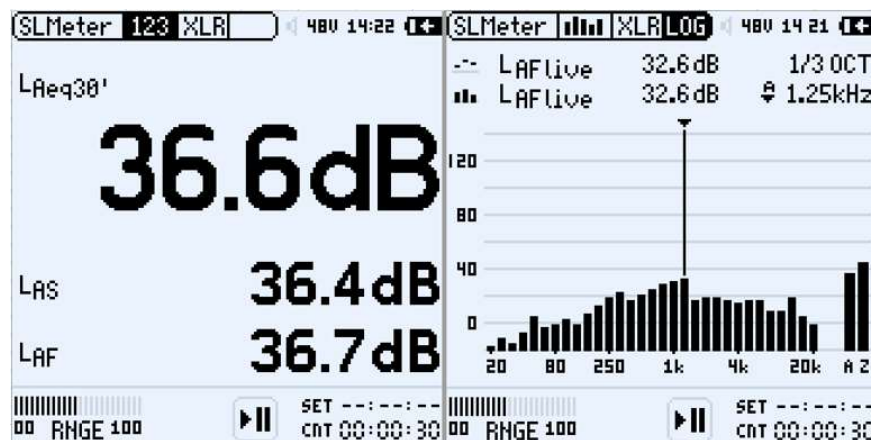


Appendix A: Measurement of Noise Level in Regulated Fan Mode

Position 1



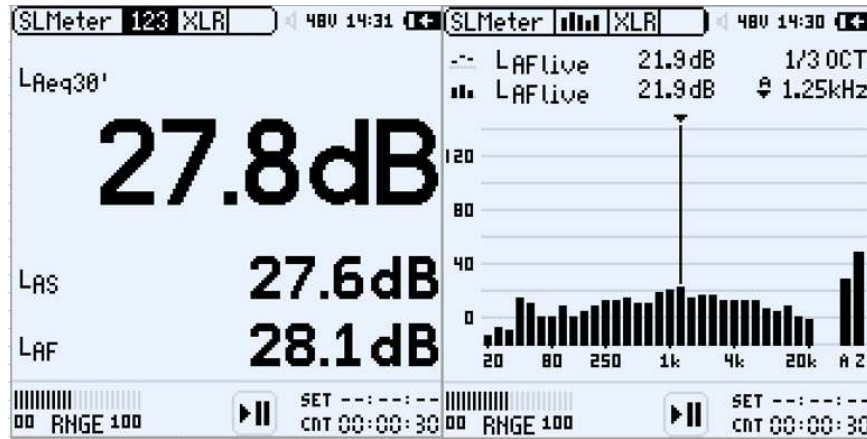
Position 2



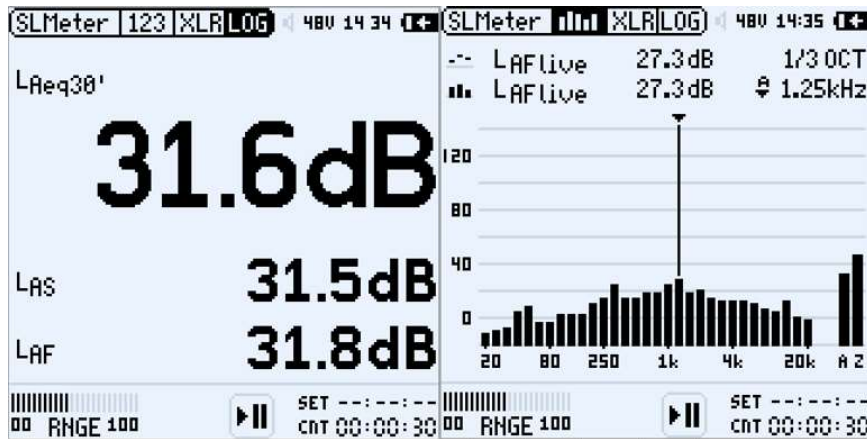
Position 3



Position 4



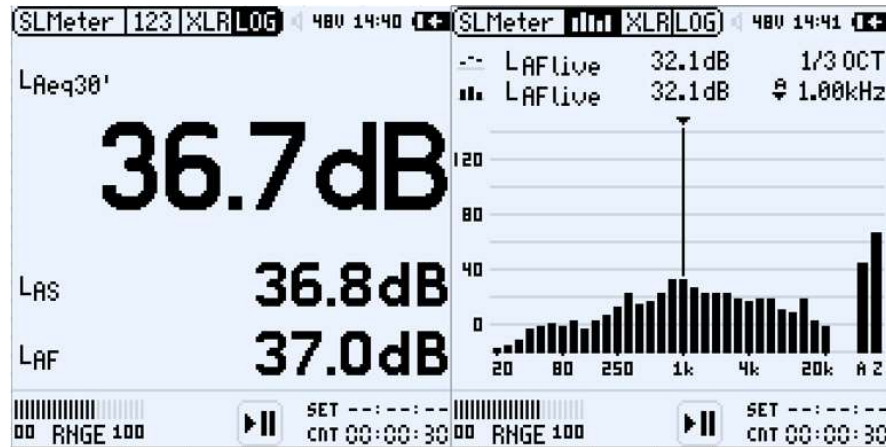
Position 5



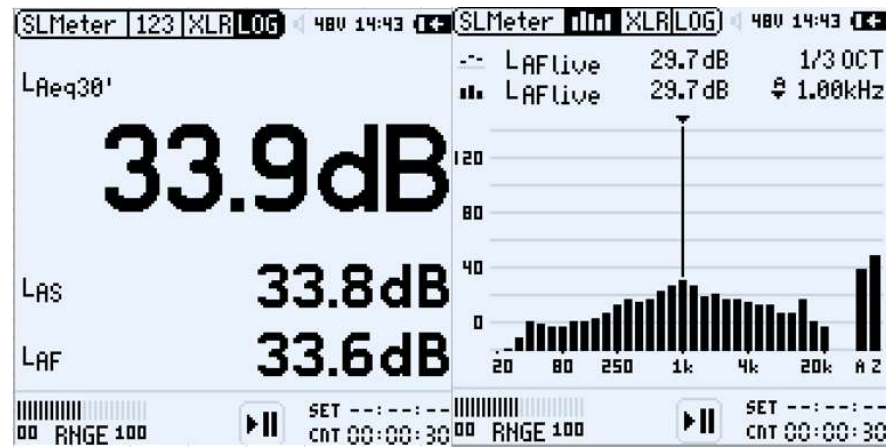
Position 6



Position 7



Position 8



Position 9



Position 10

