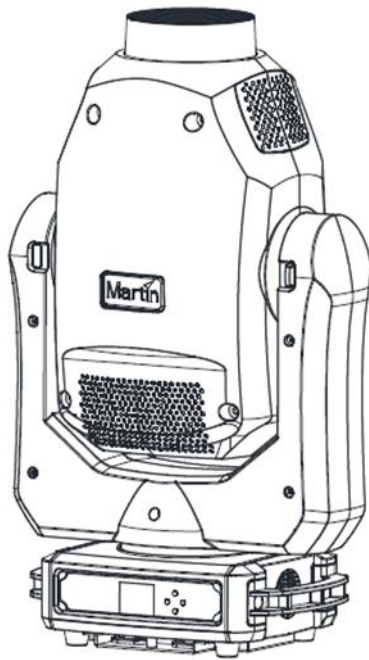


ERA 400 Performance WRM

Acoustic Test Report



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HARMAN Professional Denmark ApS - Olof Palmes Allé 18 - 8200 Aarhus N - Denmark - www.martin.com

Title

ERA 400 Performance WRM Acoustic Test Report

Test conditions

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

Device tested

Make: HARMAN Professional Denmark ApS

Model: ERA 400 Performance WRM

Serial no: 14550118399

Software version: V1.0D

Results

An image of the test setup can be found on Page 4. Test results are listed in Table 1 and Table 2 on Page 5. Figures of measurement results are shown in Page 6.

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

Environment

Temperature: 24.7°C Ta

Humidity: 60.1 %RH

AC mains power: 220 V, 50 Hz

Background noise level: 31dBA

Warm-up time: 10 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	Chloe Liu	ERA 400 Performance WRM Sound Measurement	Justin Xu	11/19/2019

Setup

The product was placed indoors in an acoustic room in 13th floor of SDC in Shenzhen, China (See Figure 1). The ceiling and walls were acoustically absorbent and the floor was reflective. The main dimensions of the room were 8.54m * 6.26m * 2.76m (length * width * height).



Figure 1: Test setup

The product was allowed a 10 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:

- Hemispherical measurement model
- 10 microphone positions in total
- Measurement surface area: 14.14 m²

Instrumentation

Please refer to Page 10 for a full instrumentation list.

Results

The ERA 400 Performance WRM was measured in 2 scenarios:

All effects static, Light source ON, 100% output white light – Cooling Mode REGULATED FAN

All effects static, Light source ON, 100% output white light – Cooling Mode FULL

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

Position number	Coordinate of each microphone position (m)			Data/dB(A)	Data/dB(A)
				REGULATED FAN	FULL
1	0.24	-1.44	0.33	47.4	53.7
2	1.17	-0.90	0.30	49.3	51.0
3	1.17	0.83	0.47	47.0	48.9
4	0.24	1.35	0.62	44.3	49.4
5	-1.25	0.48	0.68	44.3	49.8
6	-1.25	-0.60	0.57	46.5	50.6
7	-0.39	-0.98	1.07	44.7	50.6
8	1.11	-0.11	1.01	47.9	50.1
9	-0.39	0.75	1.25	42.8	50.5
10	0.15	-0.15	1.49	47.4	51.0
LpA (averaged sound pressure level)				43.9	48.1
LwA (sound power level)				55.4	59.6

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: Test Data

Sound Pressure Levels at different distances are listed in Table 2 below. Details of each measurement are shown in separate figures on Page 6.

Sound Pressure Levels				
Distance from fixture	0m	1m	4m	7m
LpA [dB(A)] REGULATED FAN	55.4	47.4	35.4	30.5
LpA [dB(A)] FULL	59.6	51.6	39.6	34.7

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

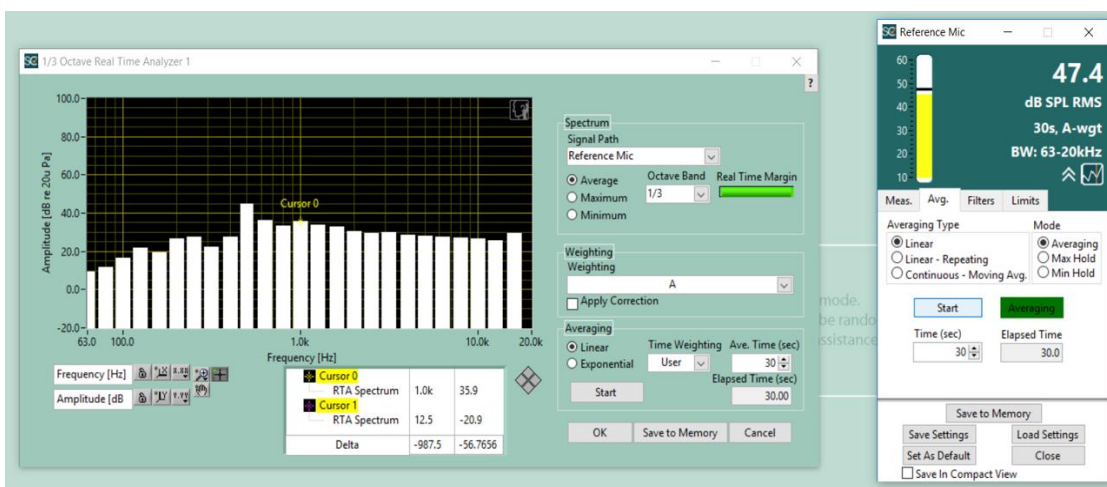
Reductions used: 8dB(A)@1m, 20dB(A)@4m, 24.9dB(A)@7m

Table 2: Sound Pressure Levels

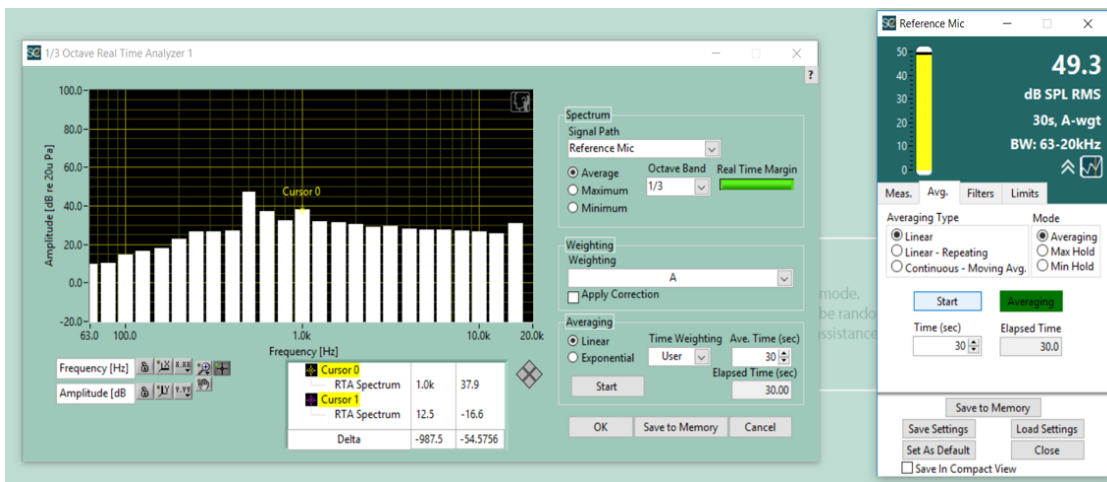
Noise level details

The following figures show the noise level details of REGULATED FAN for each test position.

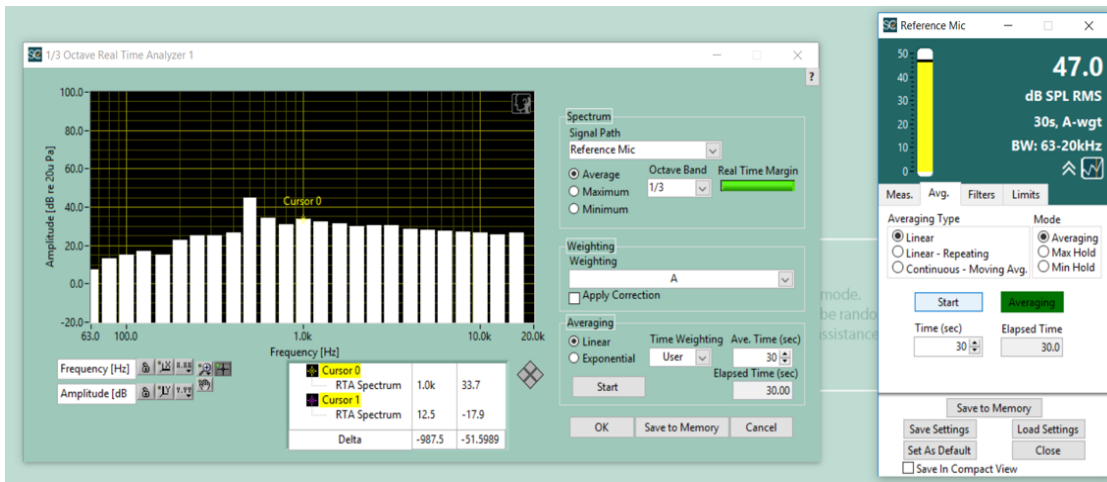
Position 1



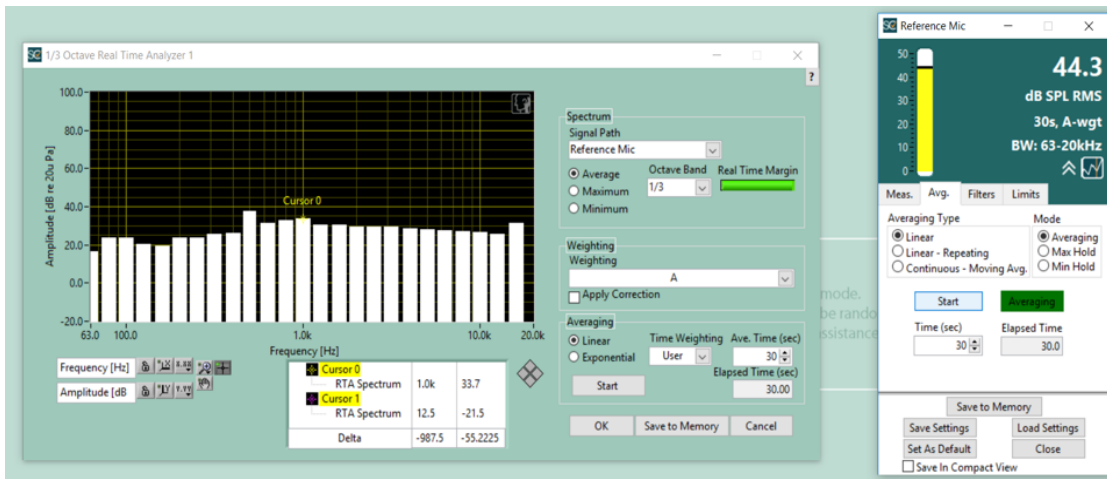
Position 2



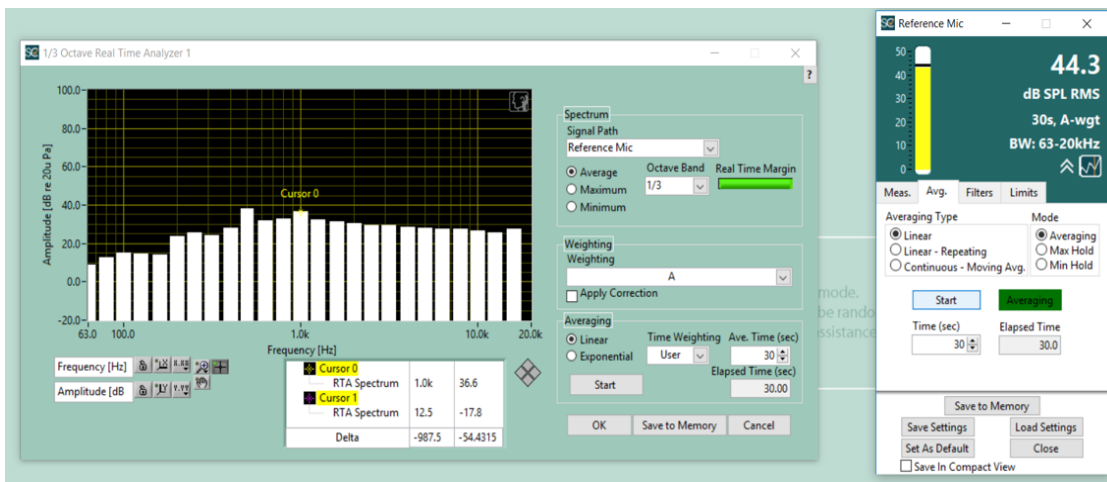
Position 3



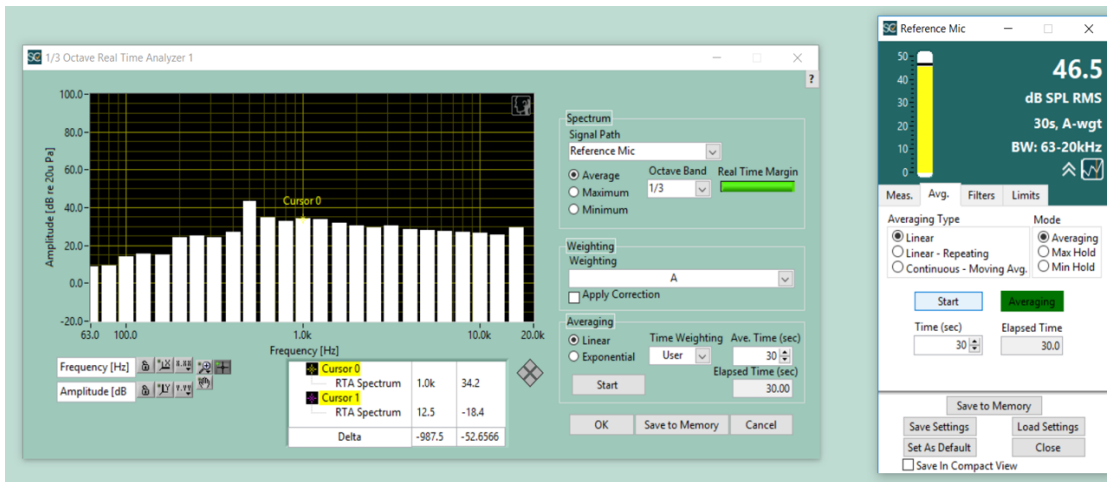
Position 4



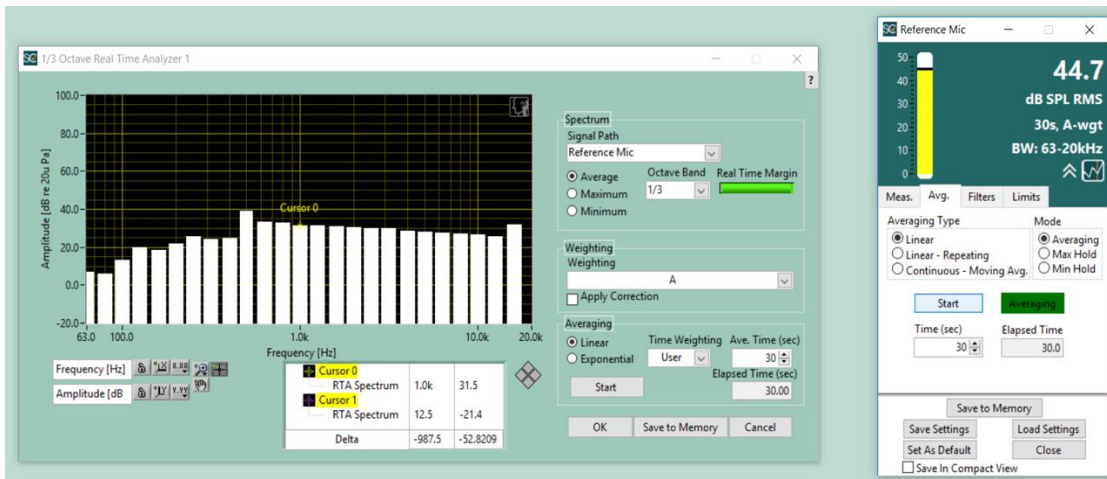
Position 5



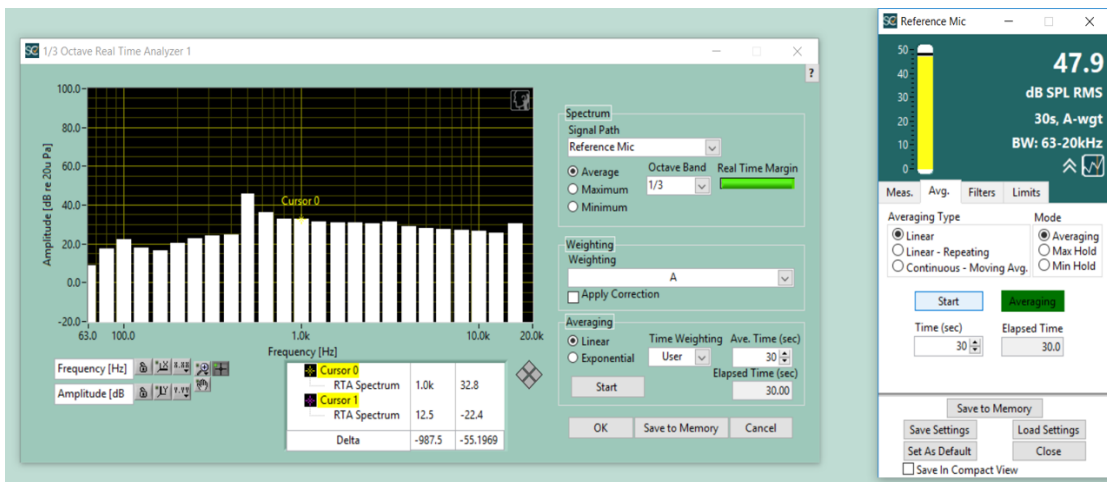
Position 6



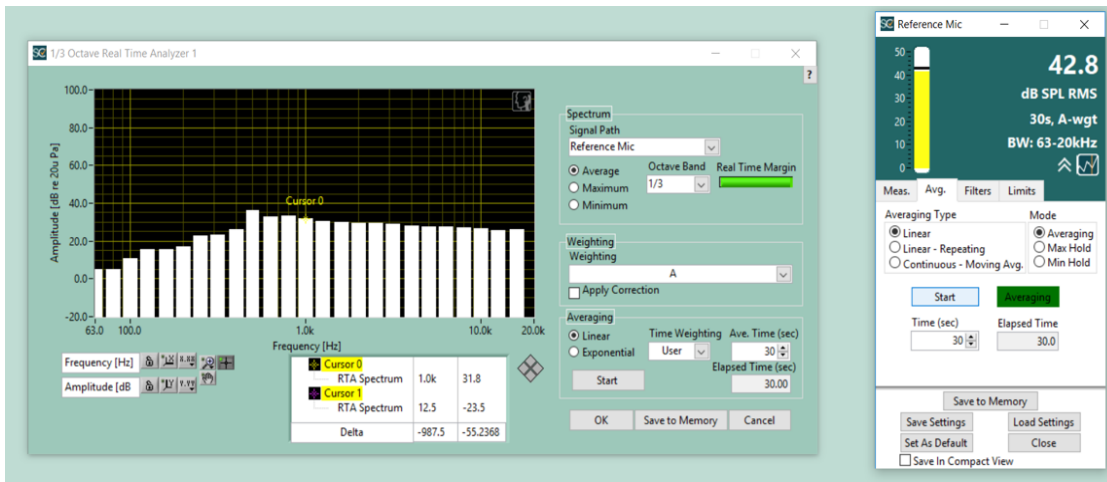
Position 7



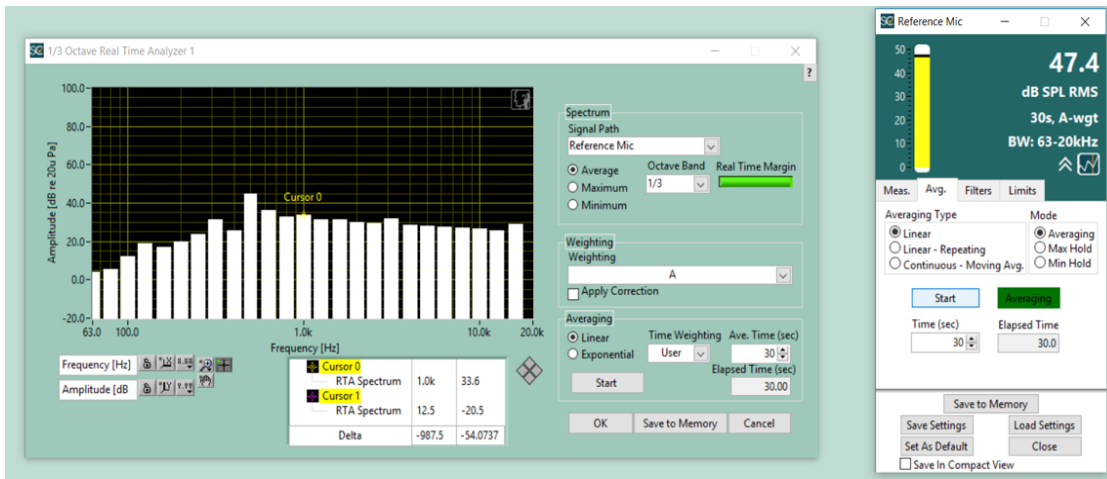
Position 8



Position 9



Position 10



Instrumentation

Equipment	Make	Type
SoundCheck 16 Ampconnect	Listen Inc.	
Microphone	G.R.A.S	40PP-S1

Table 3: Instruments Used

