

An acoustic intervention of a live music club for a safe and good music environment

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Background

20% (18-80 y) has a hearing loss SBU 164:2003

15 % has tinnitus (50.000 a severe form)

HRF, Sweden, 2006

15 % are oversensitive to sound

"The Acoustic project"

- "The birth"
- Problem areas
- The venue choosen
- The intervention- What did we do?
- Results
- Spreading of knowledge
- Summary

National Board of Health & Wellcare

The Ministry of Health & Social Affairs

The Health & Safety Office, Göteborg

The Event Organisers Association

The Board of Culture, Göteborg

The National Concert Organizer, Sweden

The Swedish Work Environment Authority

National Institute for Working Life

Musicians, technicians ...

2003:
100 dB LAeq?

No way!
That's just impossible!



Researcher	1
Absorbent representative firm	1
Acousticians	2
Sound technique expertise	1
Health and Environmental Safety Office, Göteborg	1
Swedish Musicians Union	1
Artists and Musicians against tinnitus	2
The Event Organisers Association	1
Representatives from the music club chosen	3

The main aim

To create a healthy work- and music environment

without reducing the musicians' free artistic expression or the audiences' musical experience

Specific problem areas at smaller music clubs

Distance stage-audience= direct sound

Distance stage-audience= amplified sound

Walls, ceiling, floor

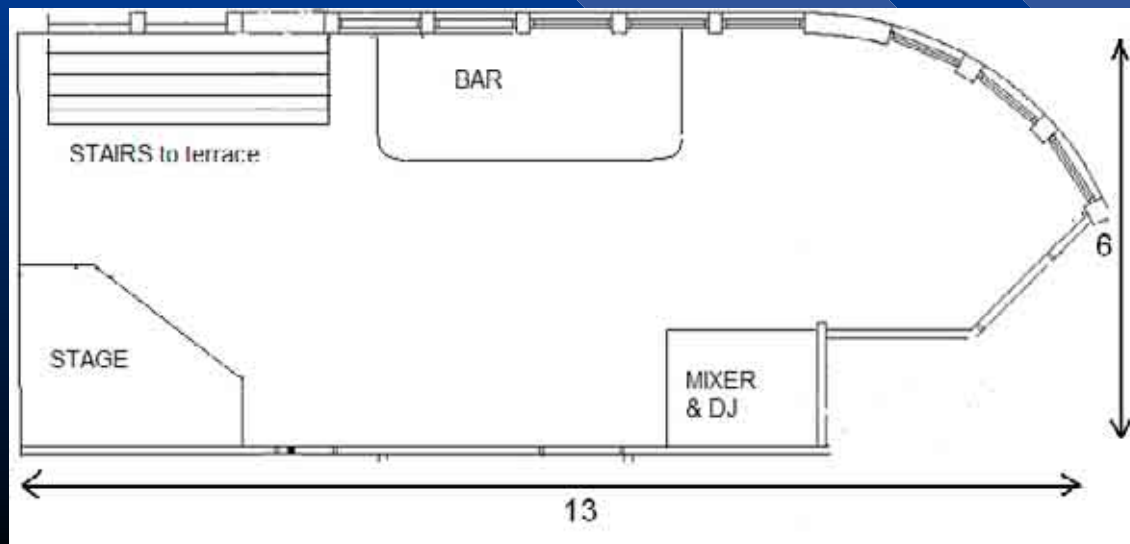
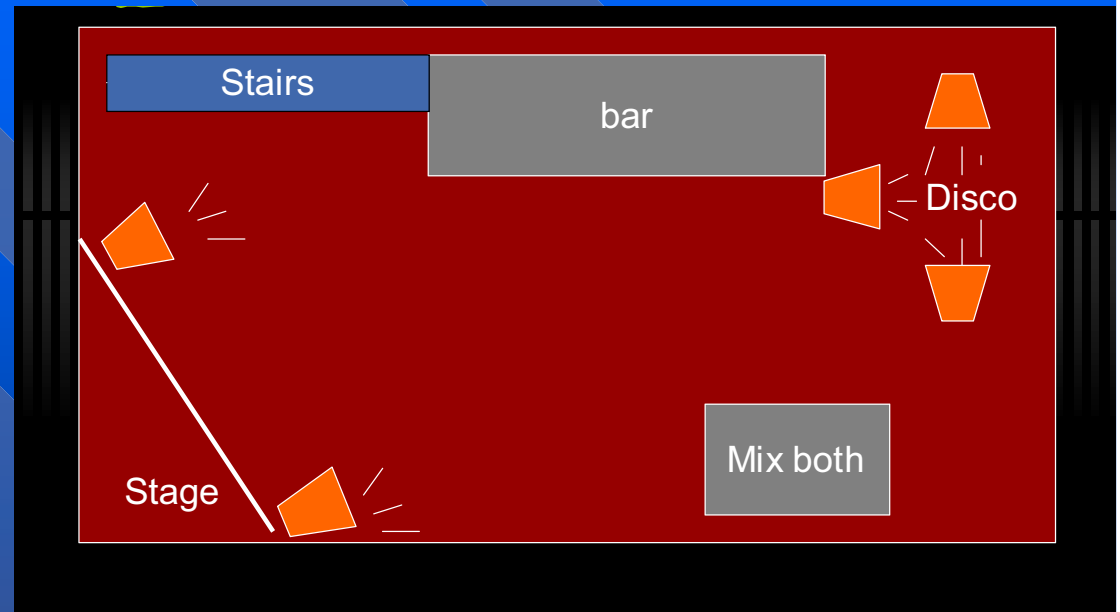
Risk awareness & knowledge

Work organisation

Sound technique

Money

The venue chosen, before the intervention



Typical factors that influences the sound in a small music club



Typical factors that influences the sound in a small music club



Typical factors that influences the sound in a small music club



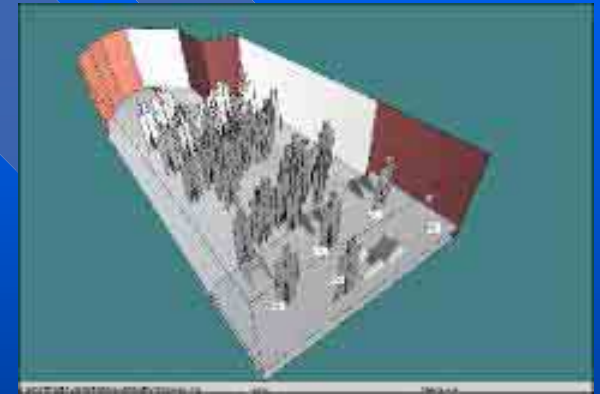




Music - Safe and Sound 2007, Kähäri
Kim

Methods

- A computerised simulation technique (CATT)



- Sound level measurements

- Questionnaire

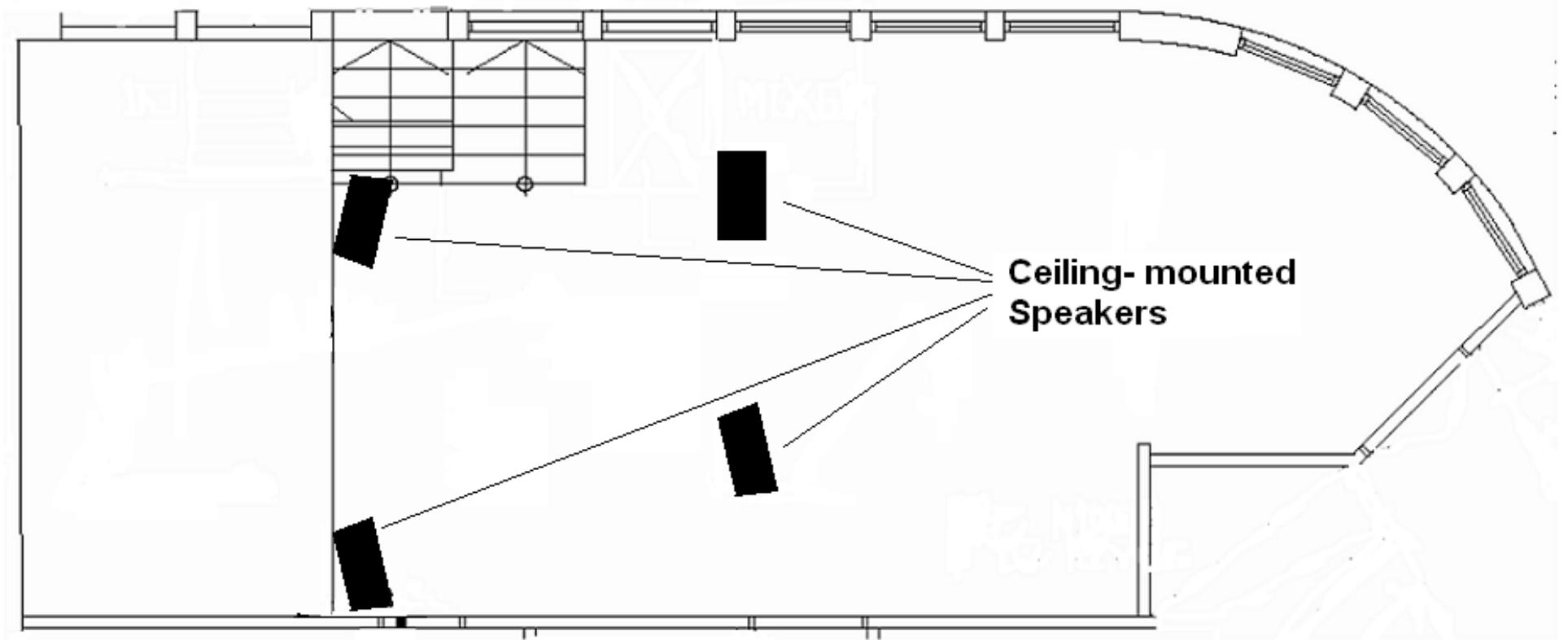
(before and after the intervention employees, musicians and audience)



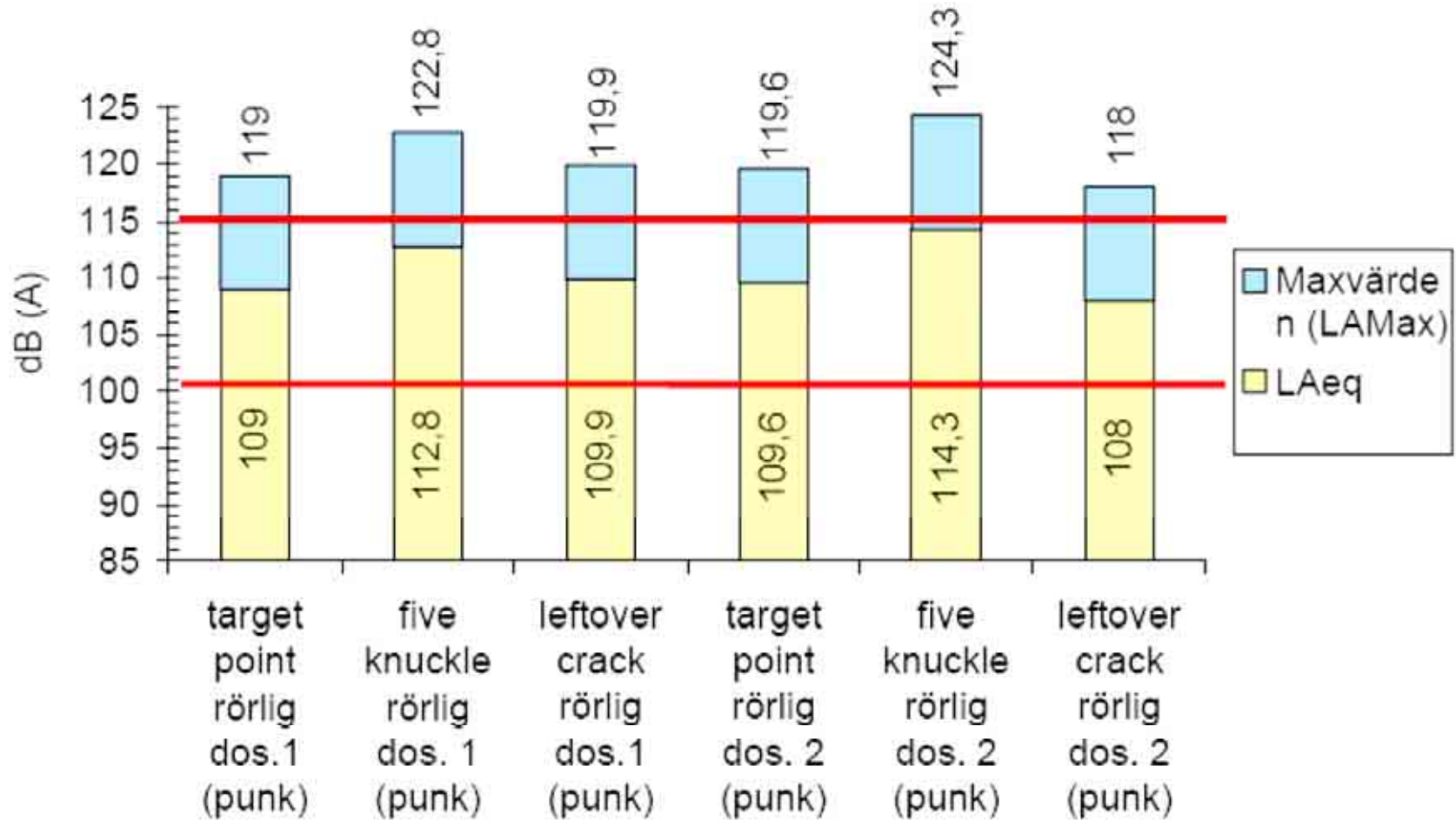


Result: A new stage, technique and acoustics





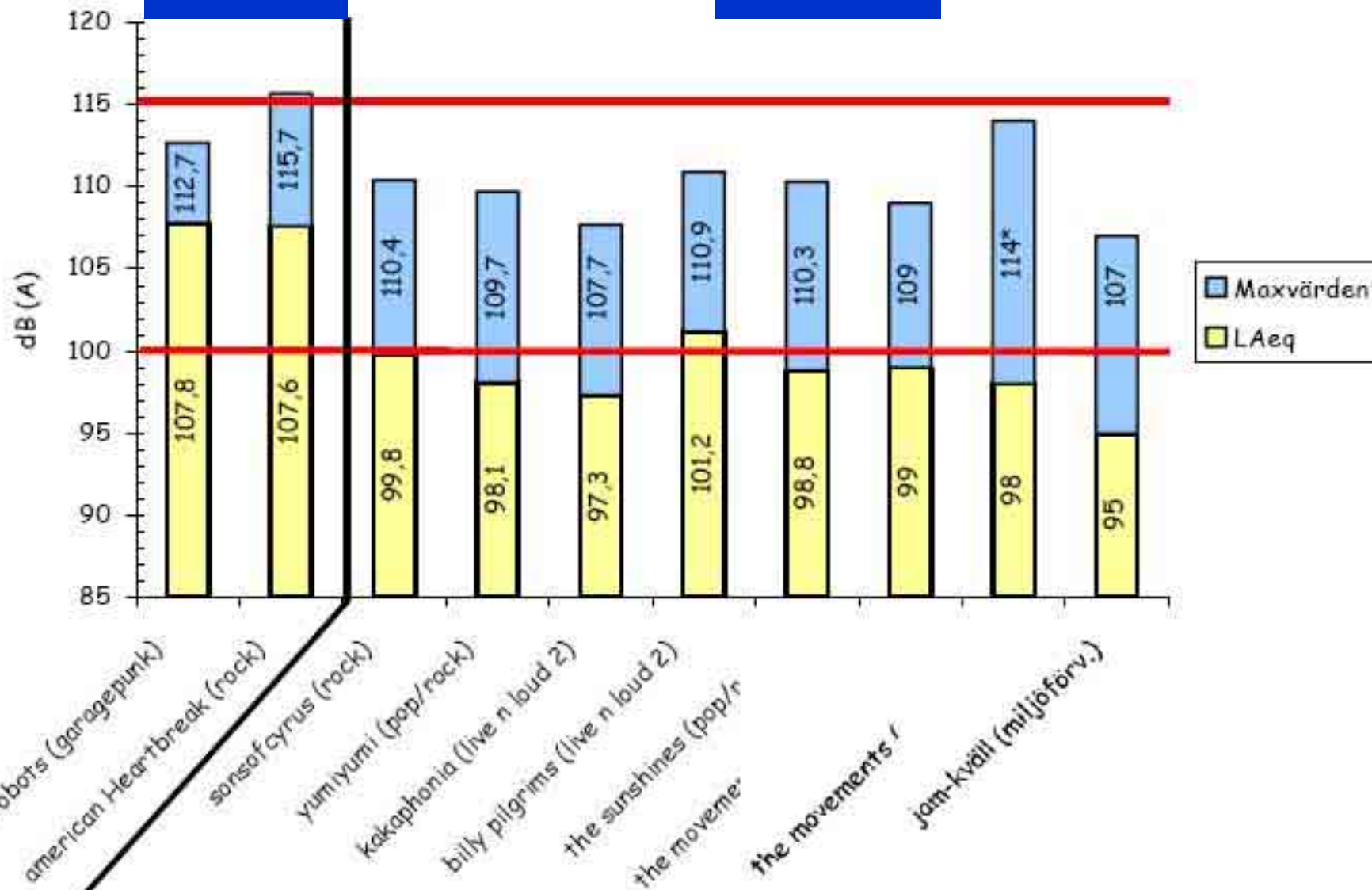
Dose meter measurements done before the intervention



Dose meter measurements

Before

After



Reduced sound levels from acoustic drums on stage

97 dBA before

94 dBA after new absorbents = - 3dB

90 dBA with a 80 cm screen = -7dB

89 dBA with a 100 cm screen = -8 dB

87 dBA with a 120 cm screen = -10 dB



Result, hearing disorders (HD) and the use of hearing protections

40 % of the audience reported HD

57% did "often or always" use ear plugs

56 % of the musicians reported HD

78% did "often or always" use ear plugs

Results, positive reactions concerning sound level

After:

96% of 25 listeners
100% of 12 musicians

Before:

45 % of 11 listeners
16% of 6 musicans

Result

A well
educated and
motivated
sound
technician



J. Harström

Spreading of knowledge

An educational day

Press conferences

Interviews /articles

Study visits

Awards x 2

Useful report

Education (sound technicians and safety officers)

Scientific article

Open doors throughout the project

Forum for discussion:

Open meetings for interested people

Chattpages on the Internet

An open diary with information, articles, protocols from meetings and results at:

www.ammot.se



Summary of results

- New acoustic absorbents on walls and in ceiling
- A more stabile stage floor with less resonance
- The bar was moved = a larger and a safer work environment
- Speakers were mounted in a audience-safe position
- Lower sound levels on stage, from stage and from PA during concerts and disco
- The direct sound reflected from the stage was reduced by half
- An educated sound technician
- The sound variation was reduced from 14 to 3 dBA
- Employees, musicians and audience were positive.

Summary

The employees meant that their work environment was radically improved.

The sound levels were rated **lower** than before, but the sound quality was rated **much higher** by both musicians and audience.



Thank You for your attention!