

Beating Technology Noise

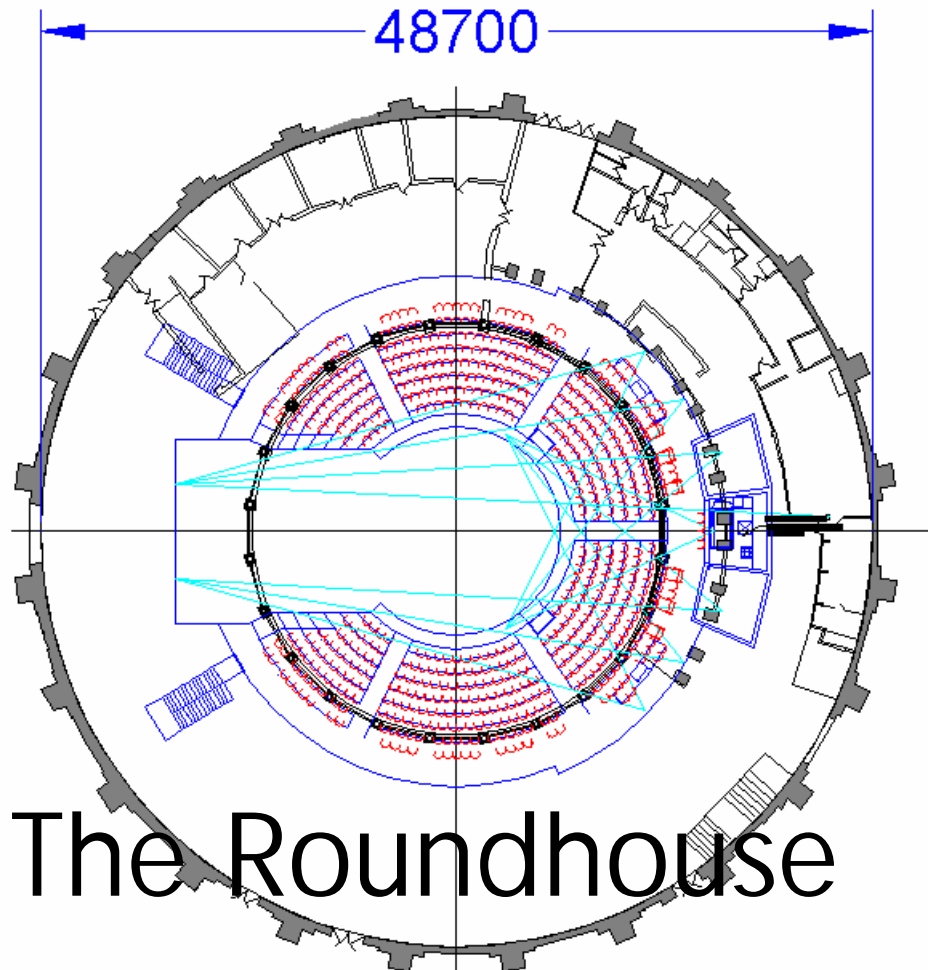
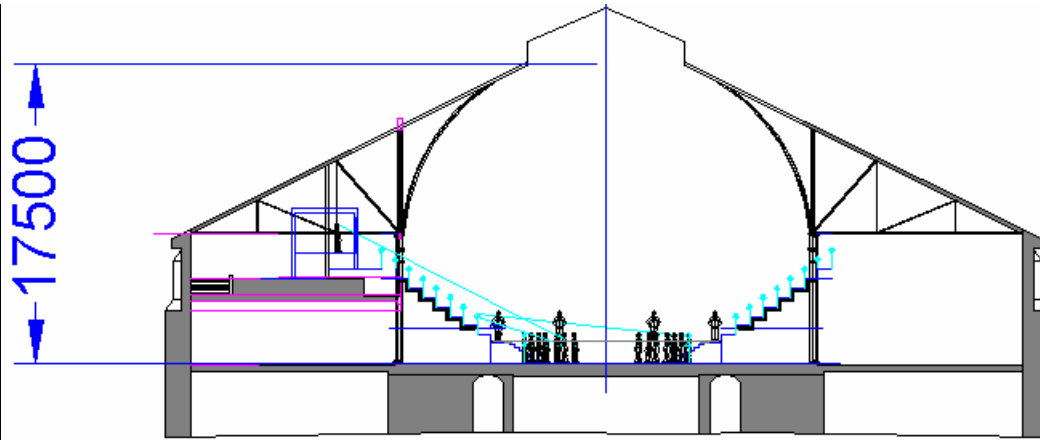
Measurements of Technology
Noise from the RSC@Roundhouse

Nicholas Edwards

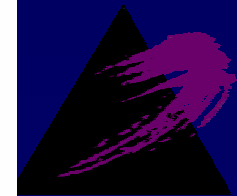
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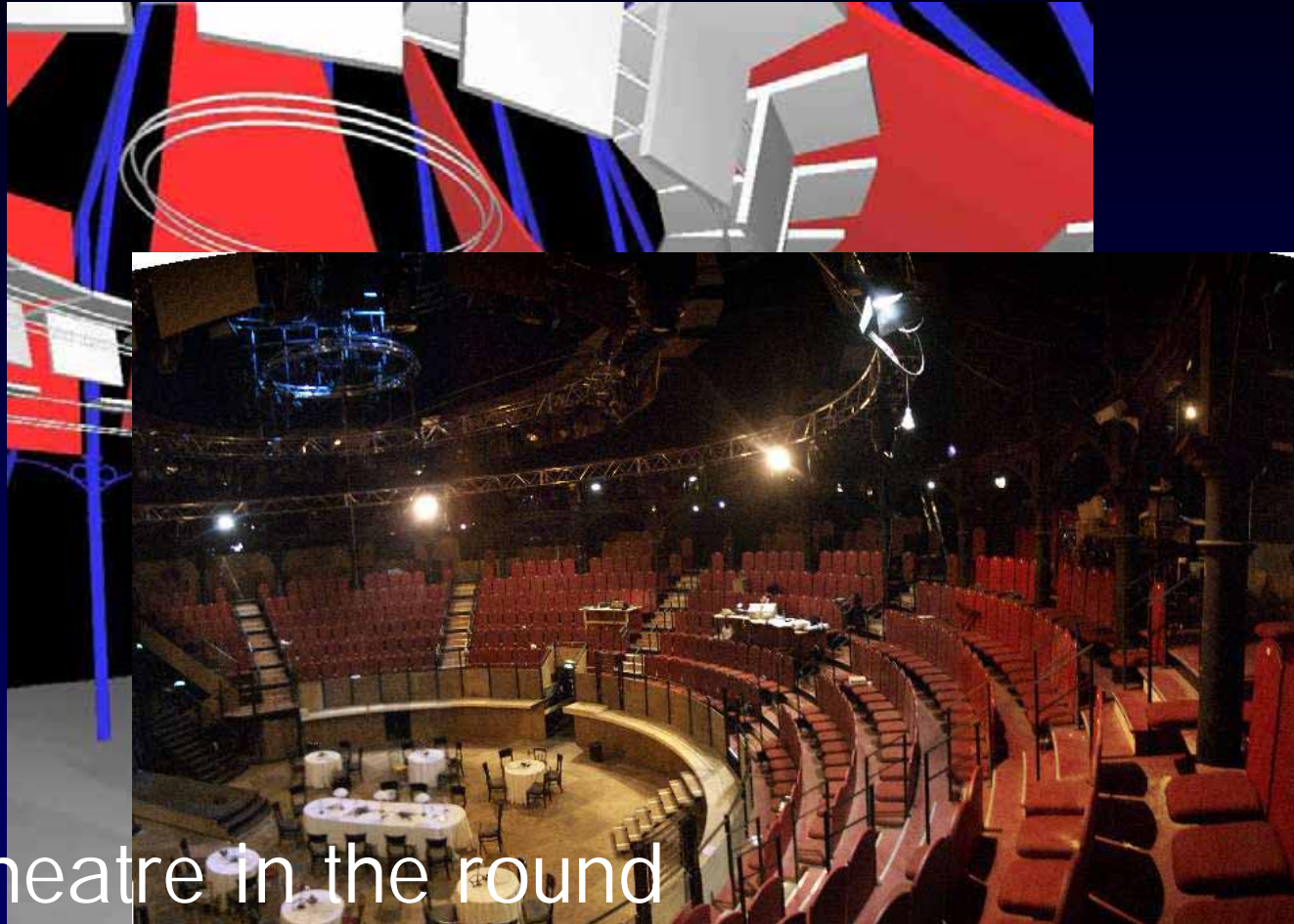


The Roundhouse





RSC @ Roundhouse



- Theatre in the round
- 600 seats
- 200+ promenade



Noise from Theatre Technology

- What noise levels should we measure?
- How does theatre technology noise compare to background noise?
- Is audible noise from theatre technology always measurable?
- What noise levels are ideal, acceptable, tolerable, or intolerable?



Thermal Comfort

- Avoids f
- Does not
- Condition
- Changing
- aimed at
- Based on
- air temp
- Meets id

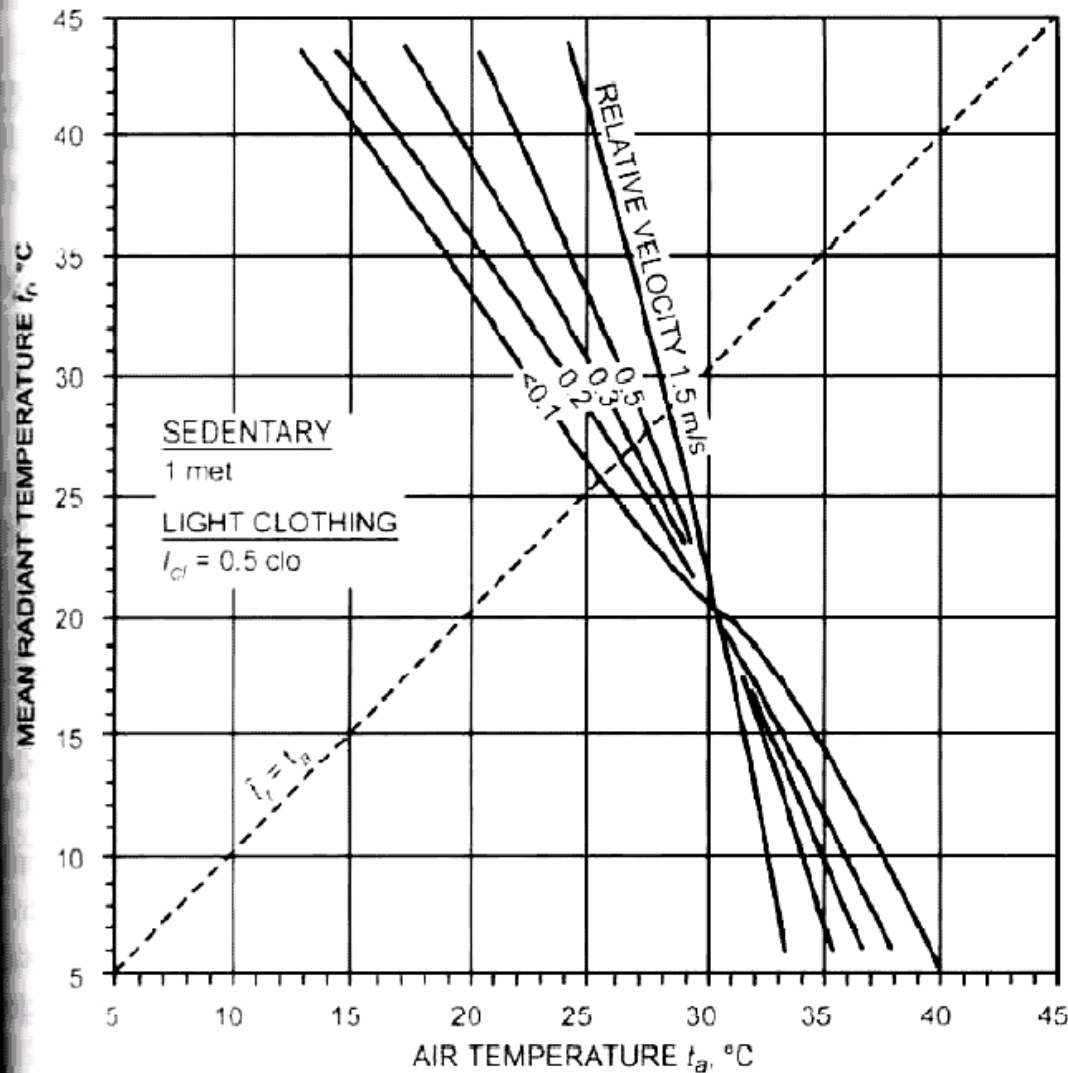
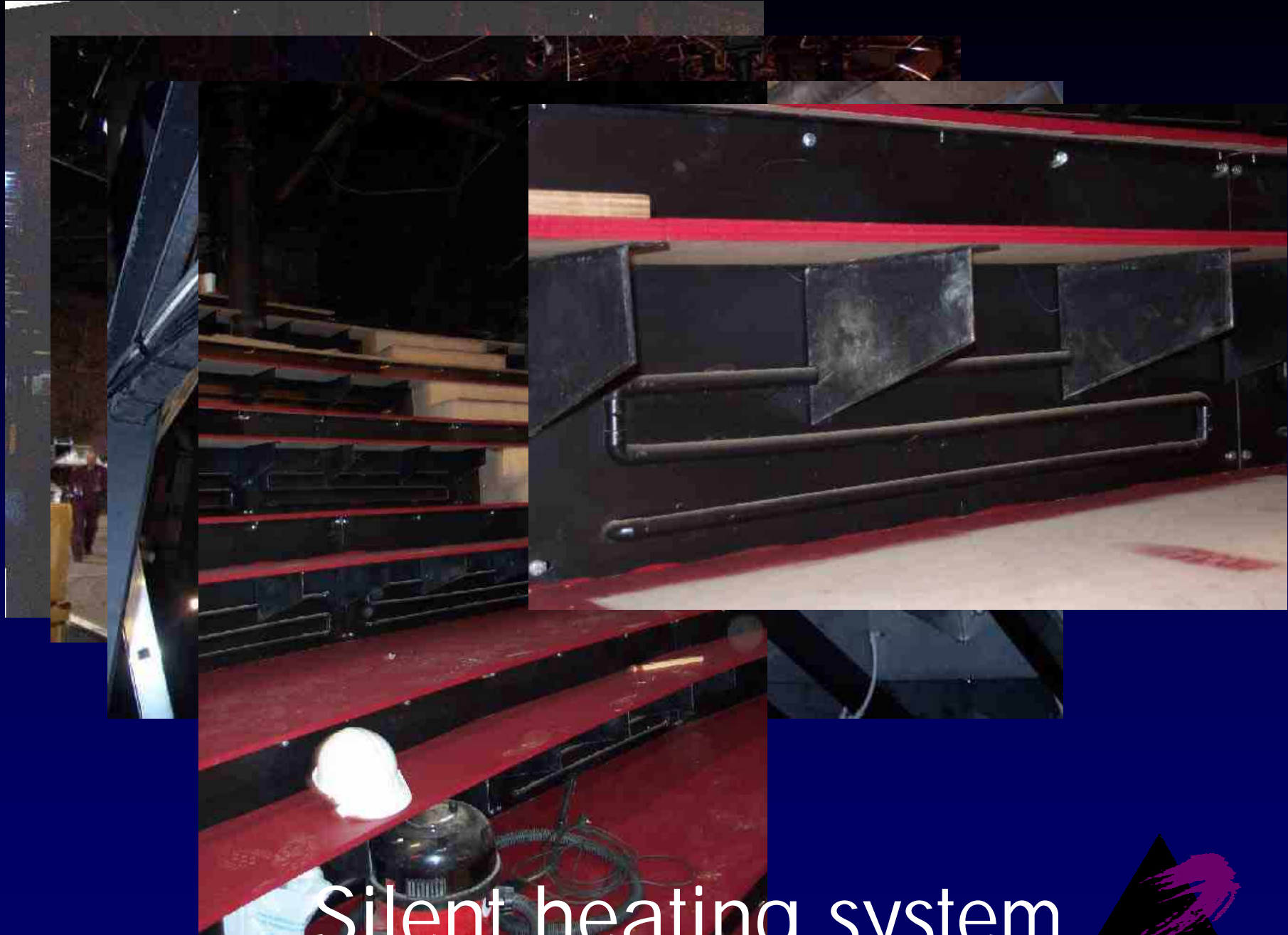


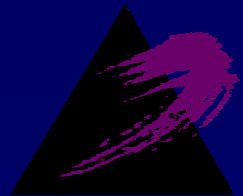
Fig. 12 Air Temperatures and Mean Radiant Temperatures Necessary for Comfort (PMV = 0) of Sedentary Persons in Summer Clothing at 50% rh

not
comfort with

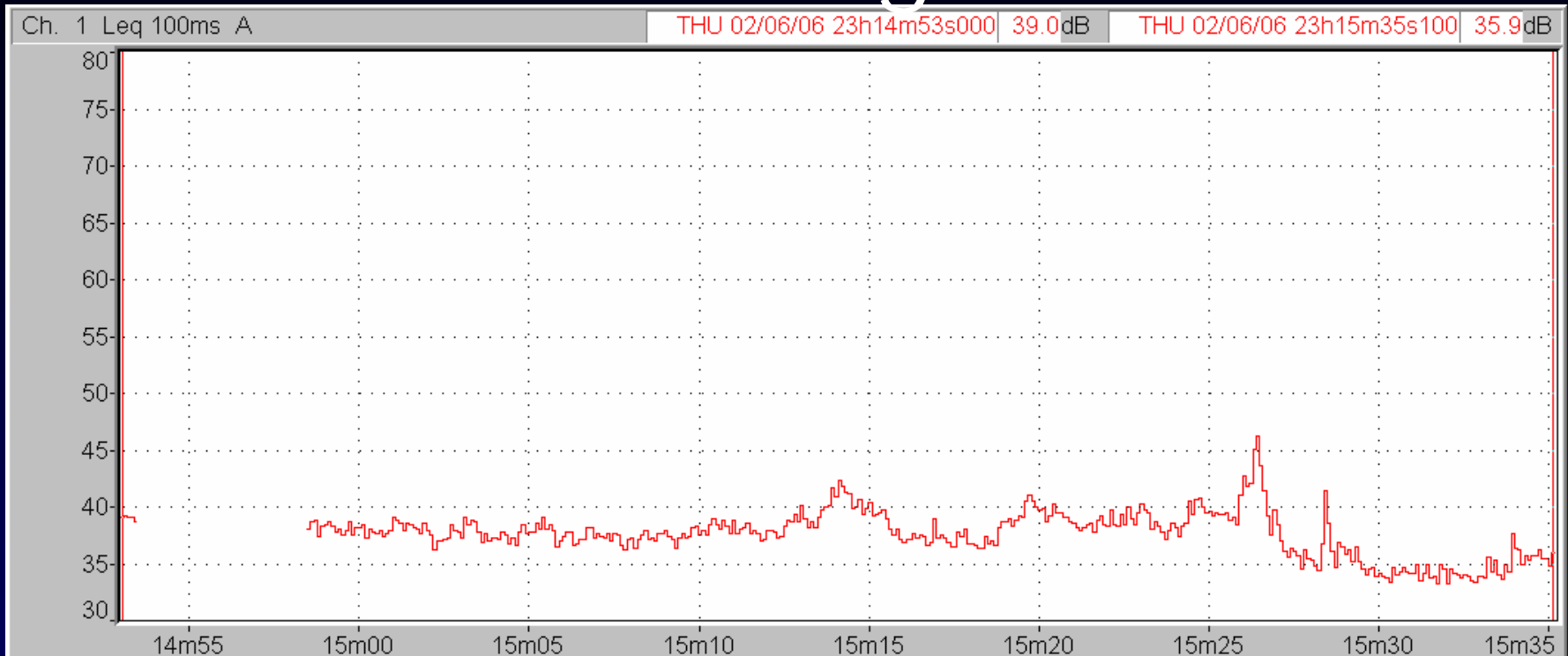




Silent heating system



Roundhouse Background Noise

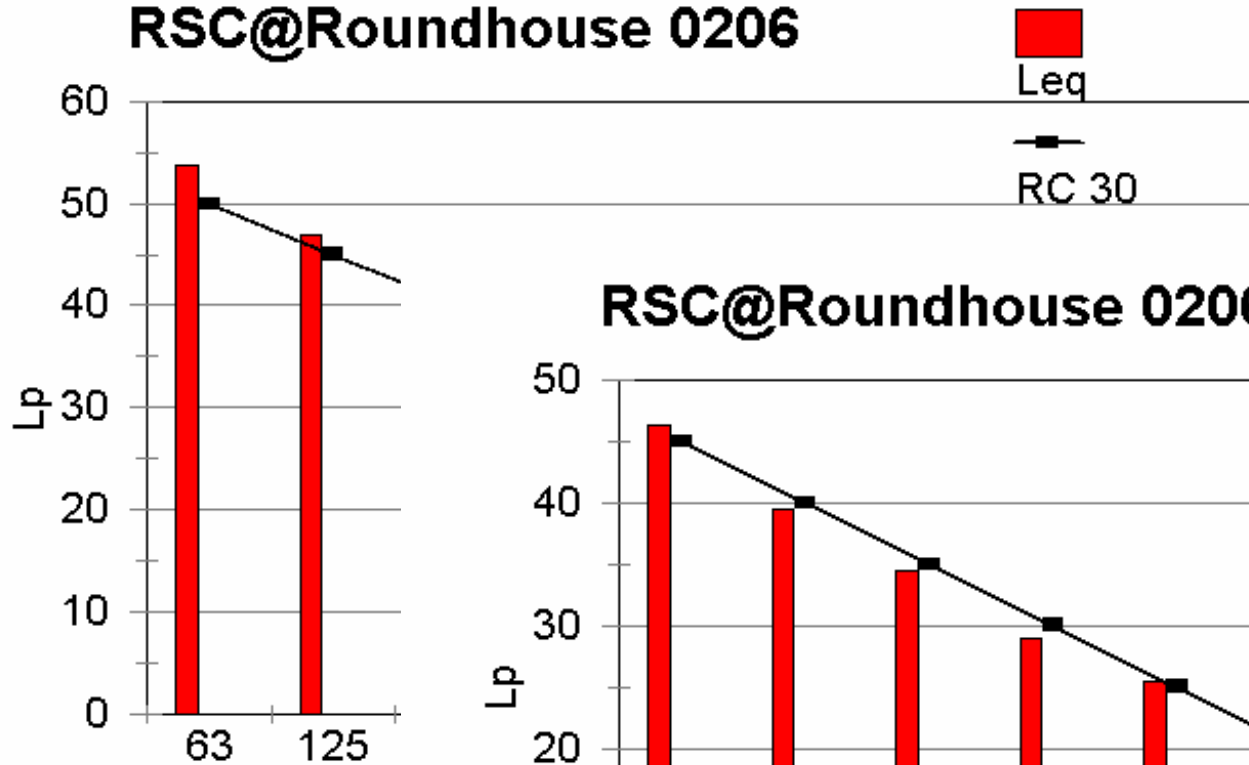


- The noise is almost entirely break-in traffic noise. The heating system is silent.
- The Roundhouse has been fitted with sound and light locks on the external doors.
- The sound-absorbing drapes reduce the background noise

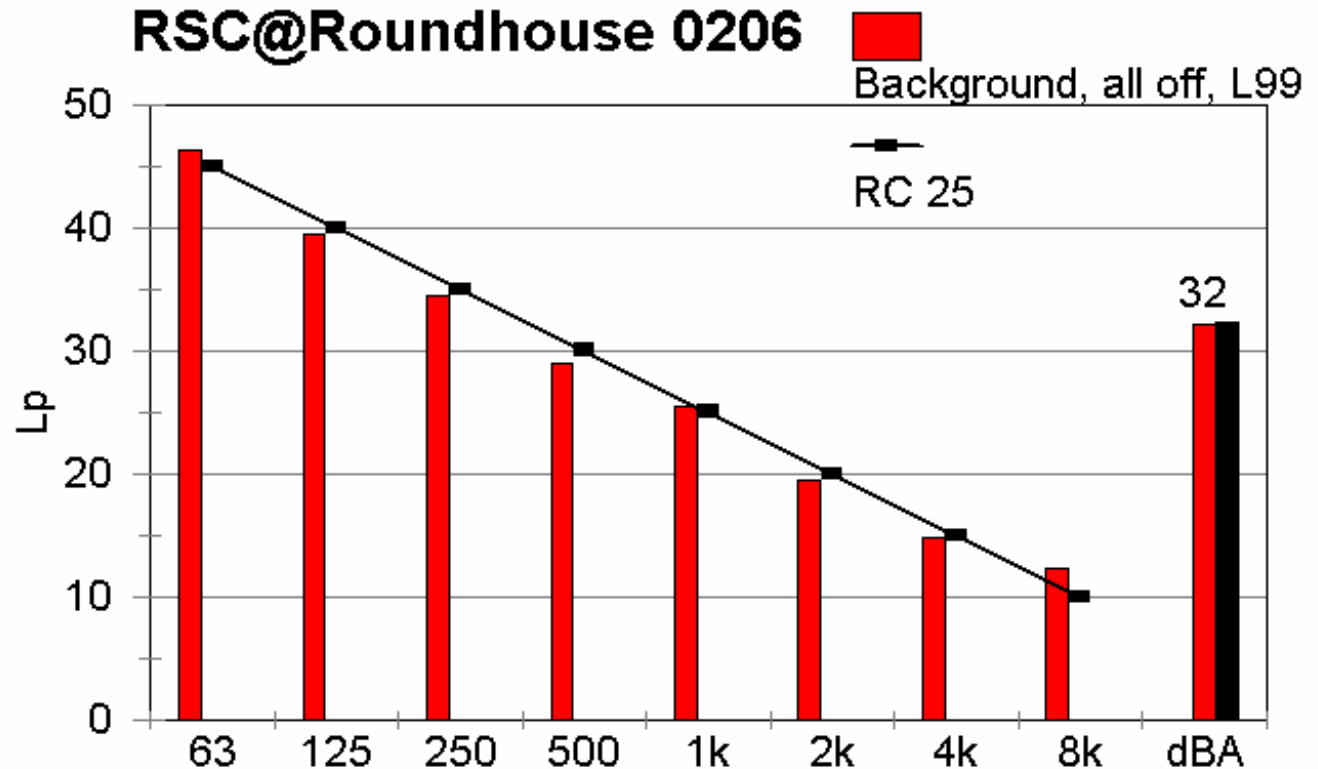


Background Noise

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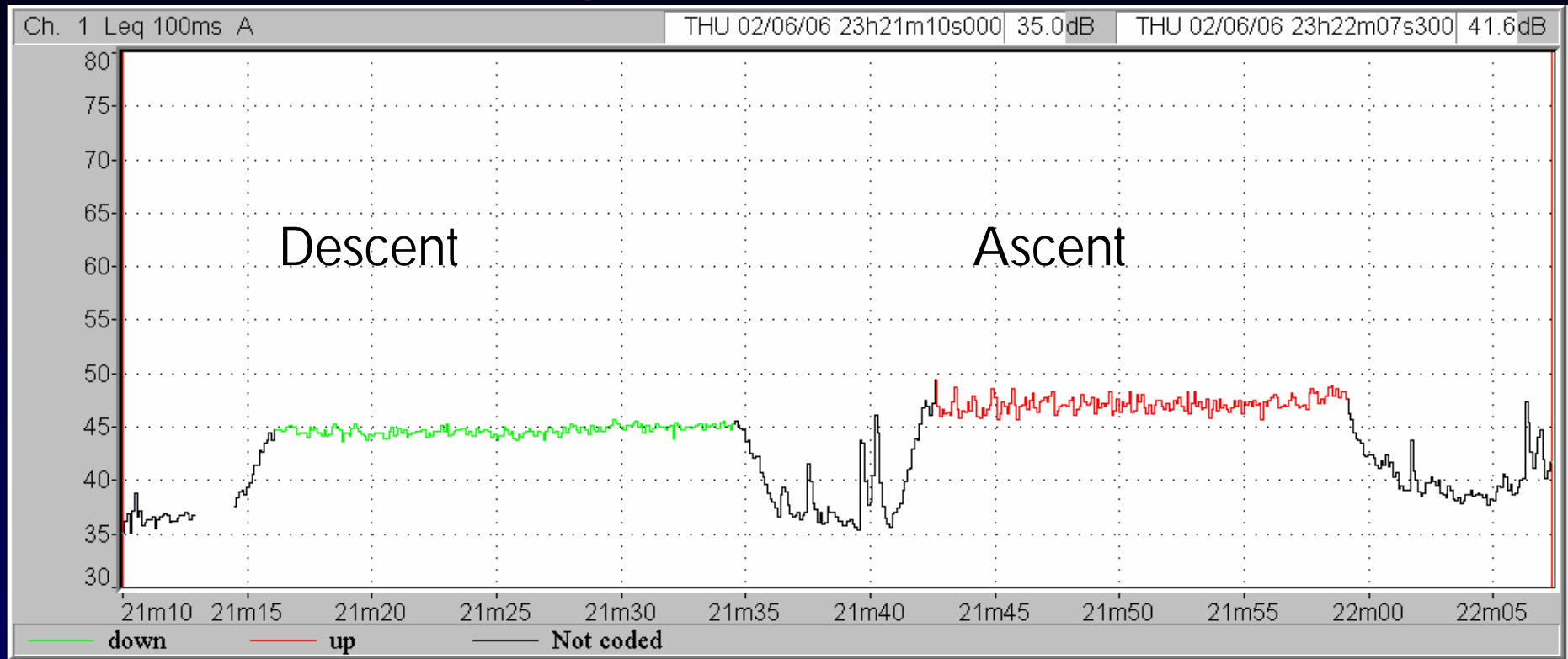


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- The Leq and RC 30 values match the background noise level, which seems more realistic.
- Subjective impression from outside noise is closer to that of the L99 than the Leq.

Big Tow Hoist

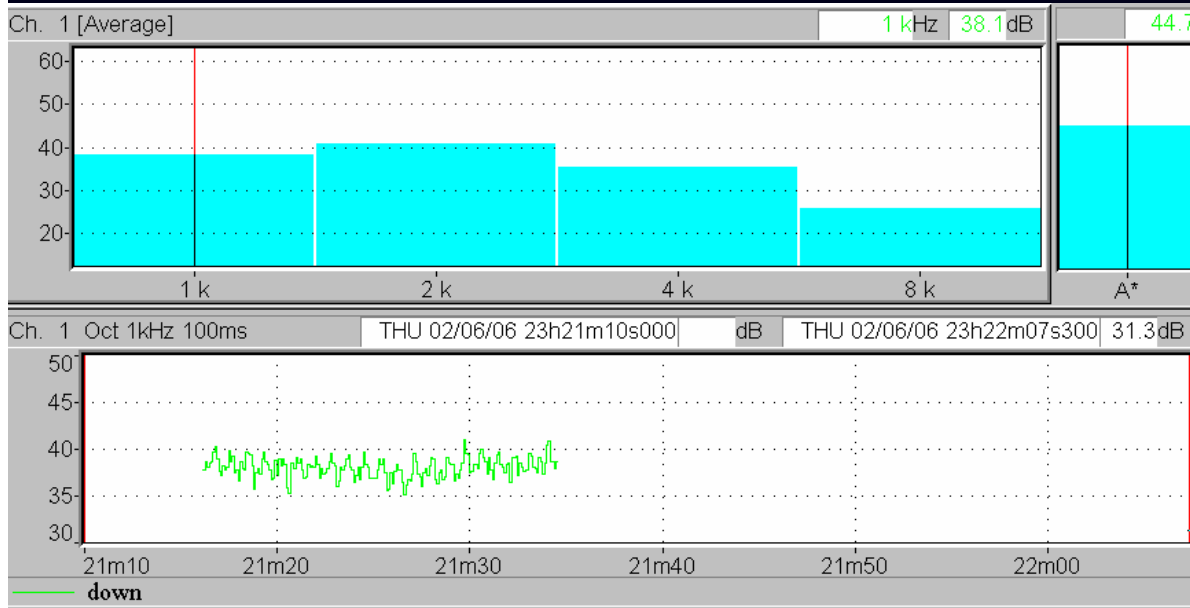


- Hoist used during speech-only parts of drama is audible, but was tolerable.
- Noise from ascent and descent is different
- Noise control: rack enclosed



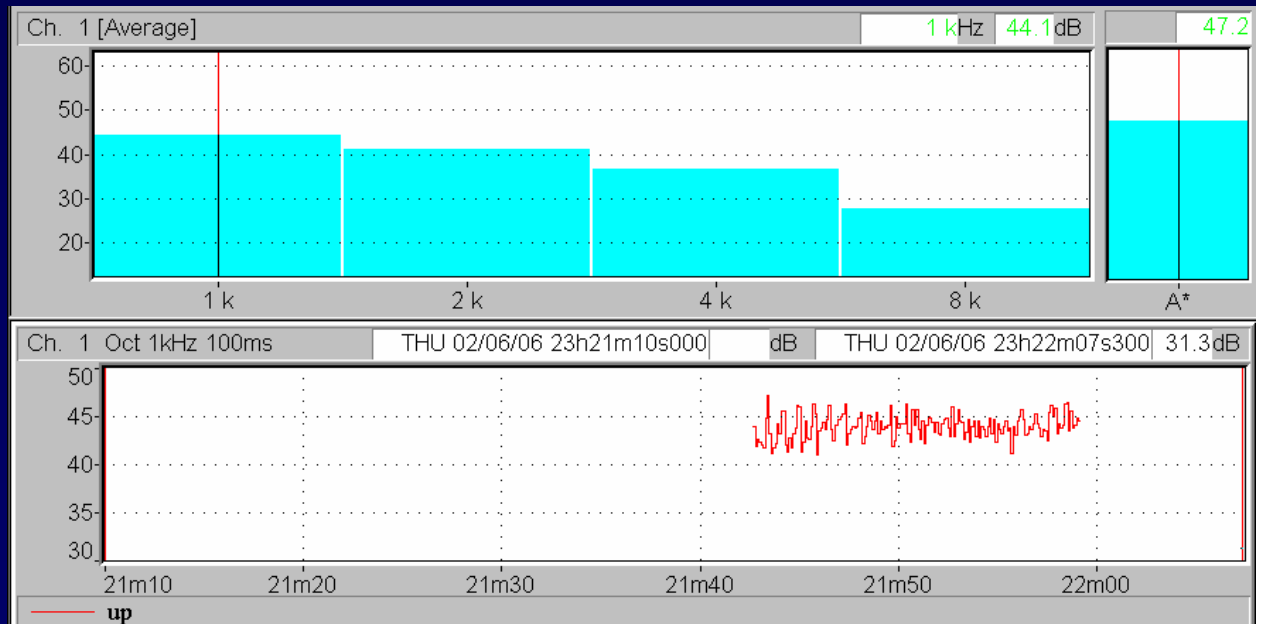
Big Tow Hoist

Noise below
1kHz was not
measurable



descent

ascent



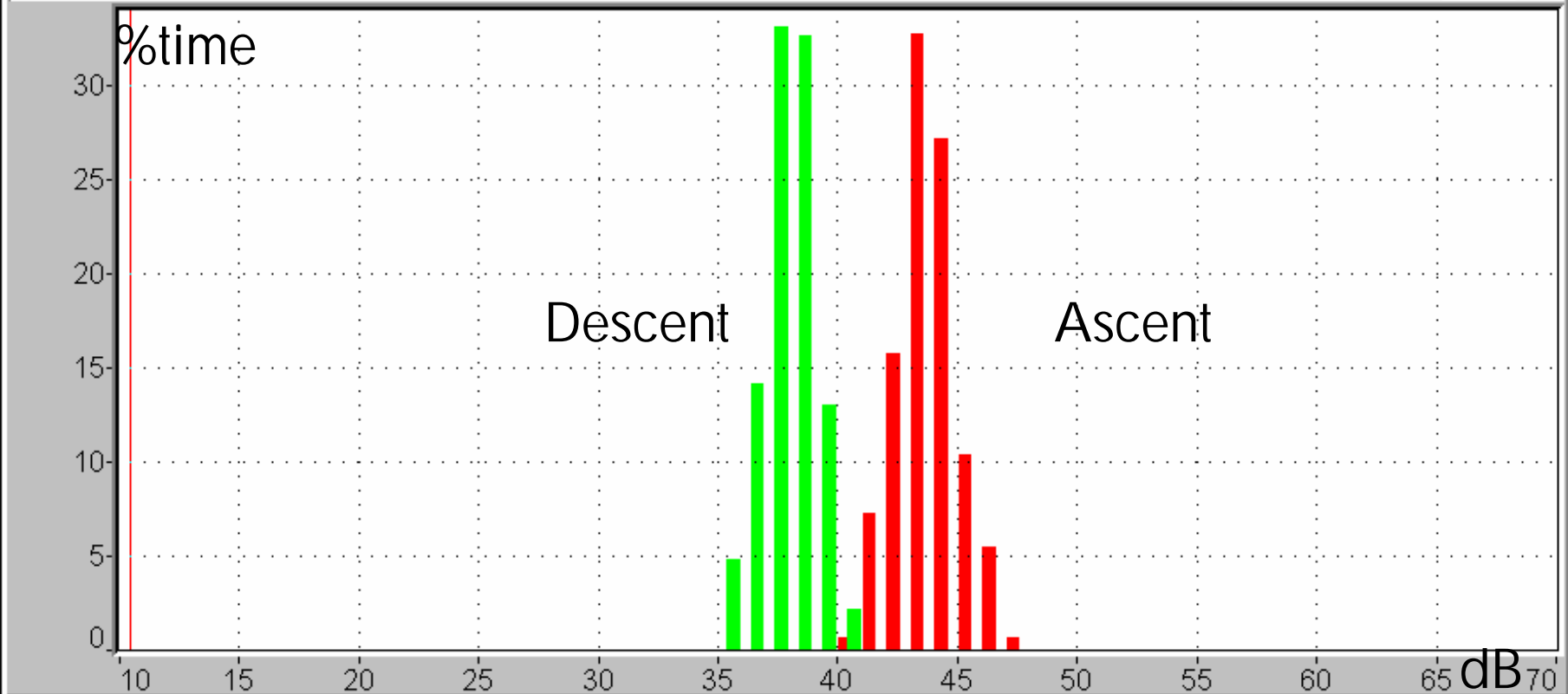
Big Tow Hoist

Ch. 1 Oct 1kHz : down

11dBLin 0.0%

Ch. 1 Oct 1kHz : up

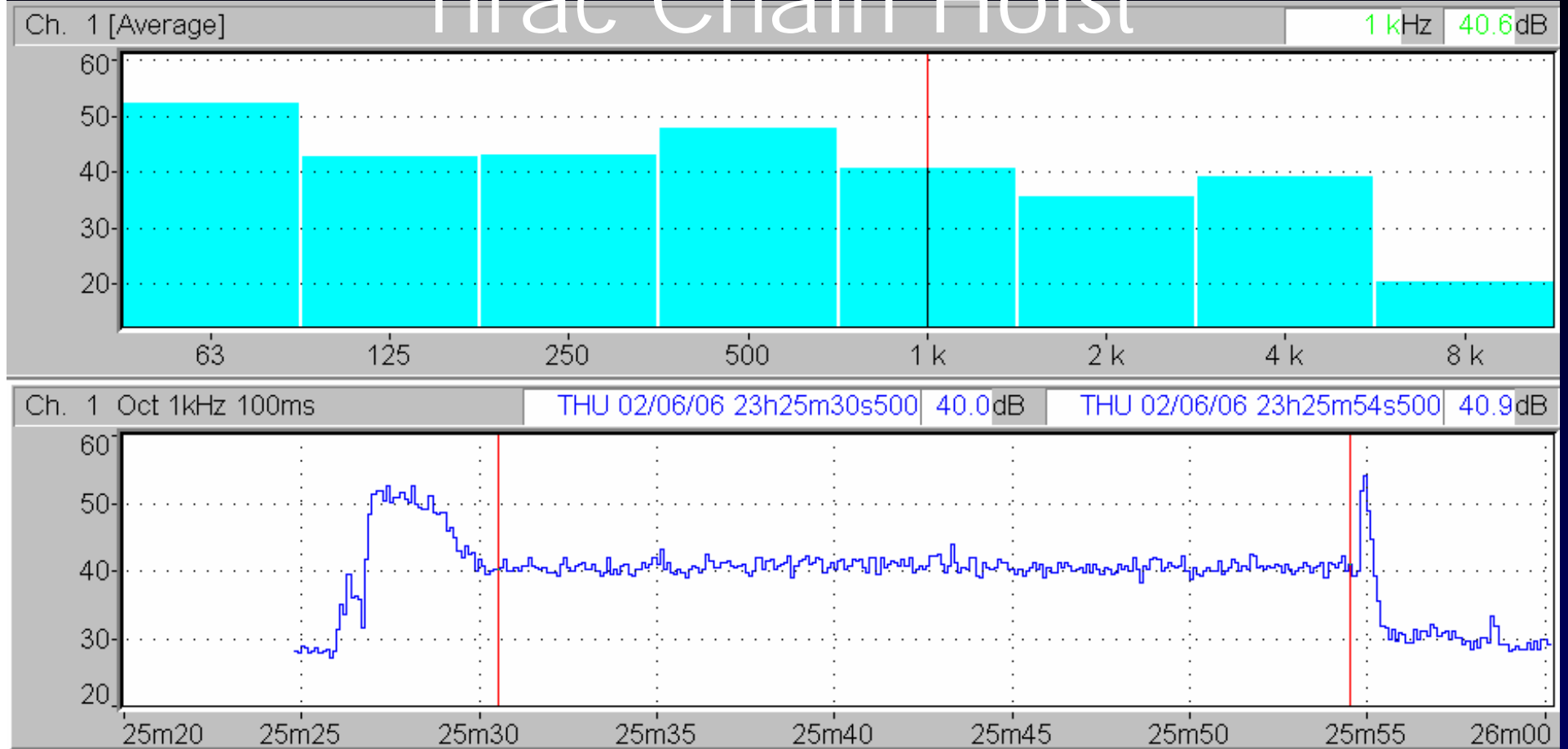
11dBLin 0.0%



- By analyzing noise level distributions, the change in the noise level for up and down movement becomes readily apparent

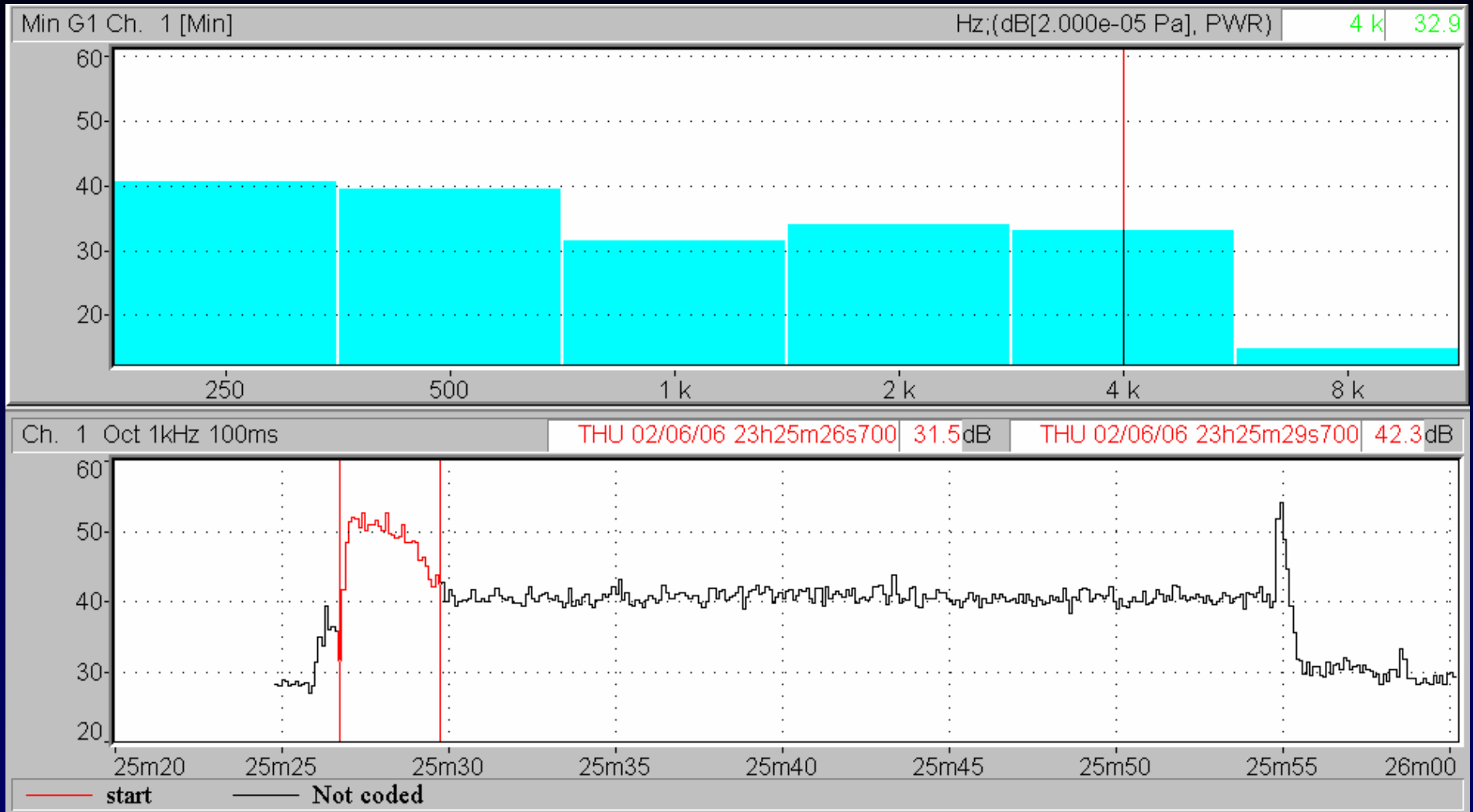


Tirac Chain Hoist



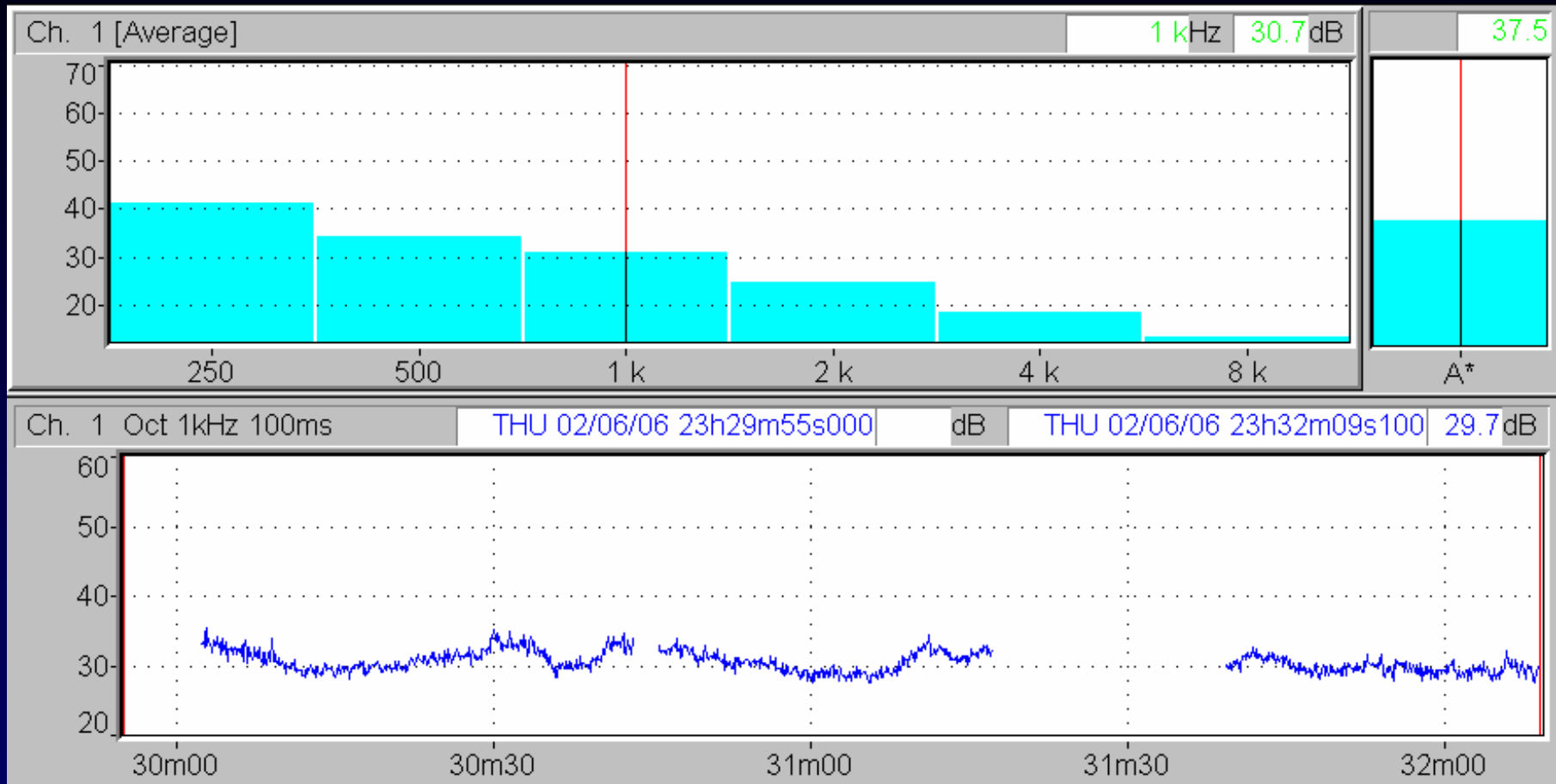
- This was considered too noisy to use during the performance except when masked by loud music
- The noise is generally 10dBA above background
- With large starting and stopping transients

Tirac Chain Hoist



- Spectrum and levels of starting transient
- Only a short-term Leq will show this aspect of noise

Hydraulic Power Pack



- Located in an enclosed room off stage.
- Audible but not measurable



12 x Varilight VL1000

Ch. 1 Leq 100ms A

THU 02/06/06 23h36m44s000

39.9dB

THU 02/06/06 23h37m44s100

38.3dB

80

75

Standing area

Ch. 1 Leq 100ms A

FRI 02/06/07 00h00m42s000

44.1dB

FRI 02/06/07 00h01m56s700

33.3dB

7

6

6

5

5

4

4

3

3

3

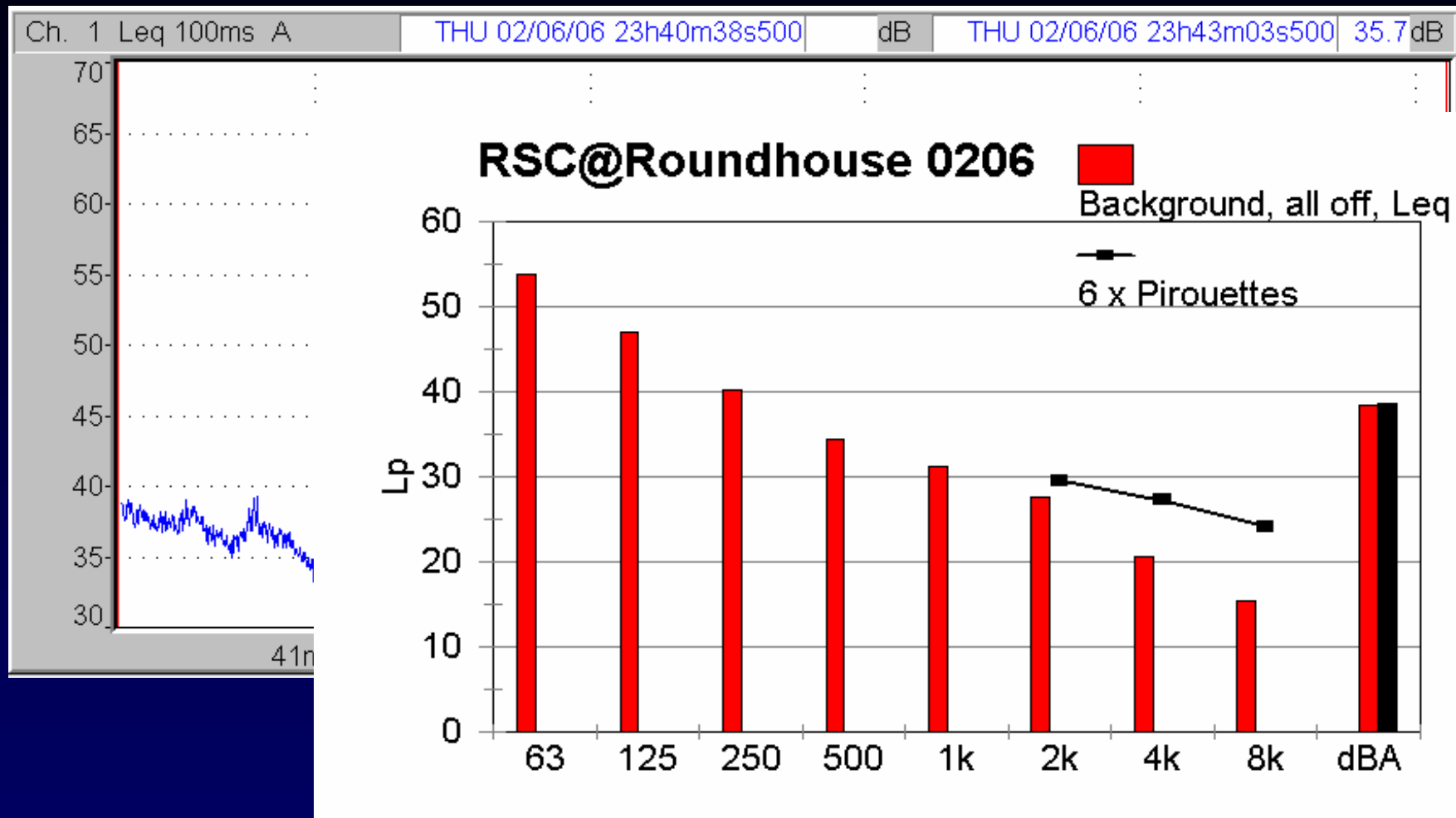
3

Seated area –
noise of
initialization

00m50 01m00 01m10 01m20 01m30 01m40 01m50

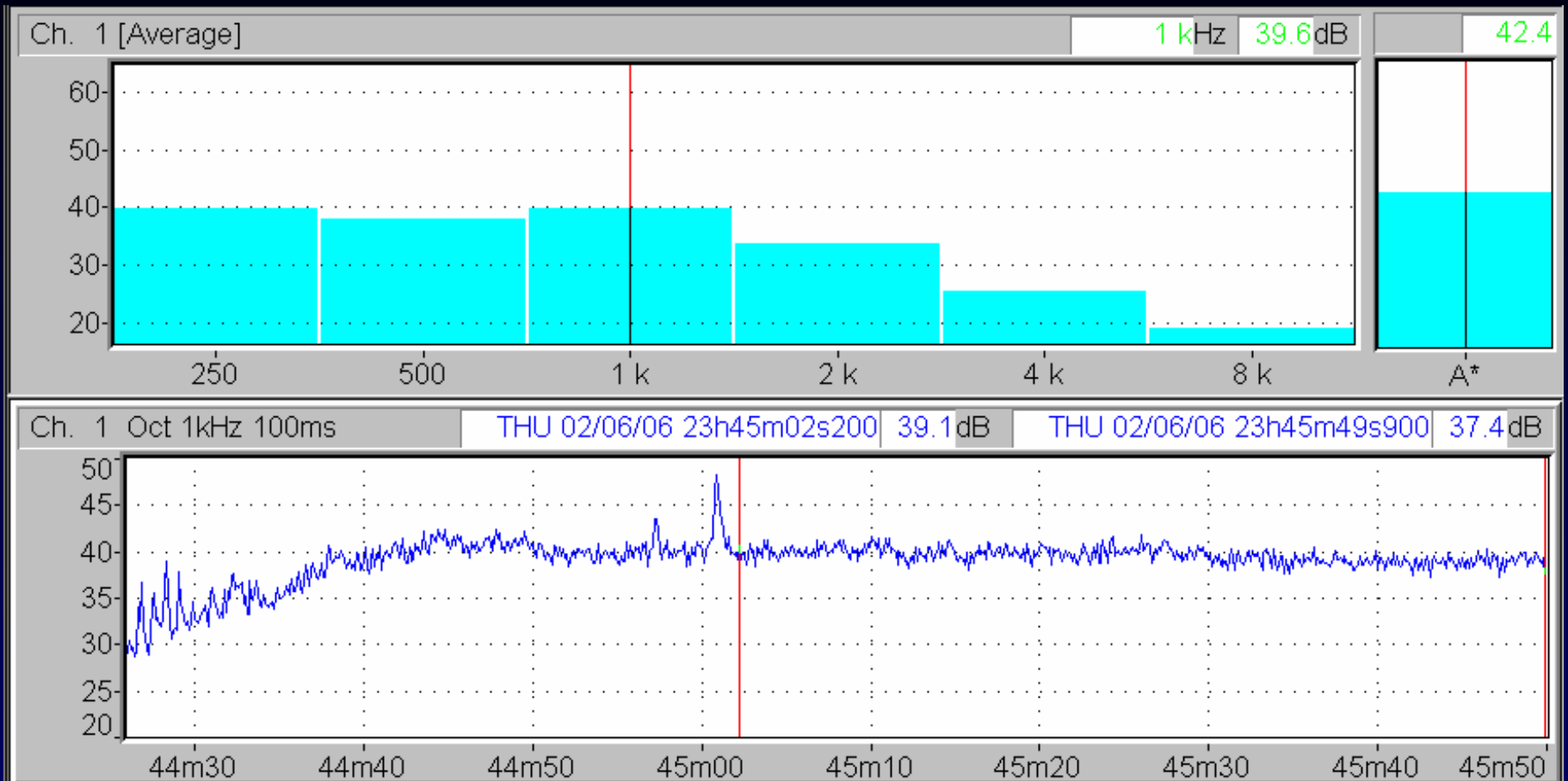
- Noise from initialization only
- VL1000 was inaudible at the Roundhouse in the promenade area or the seating area

6 x Pirouettes



- Clearly audible, but barely measurable
- Not measurable in dBA, but measurable in octave bands

5 x Mac 2000's

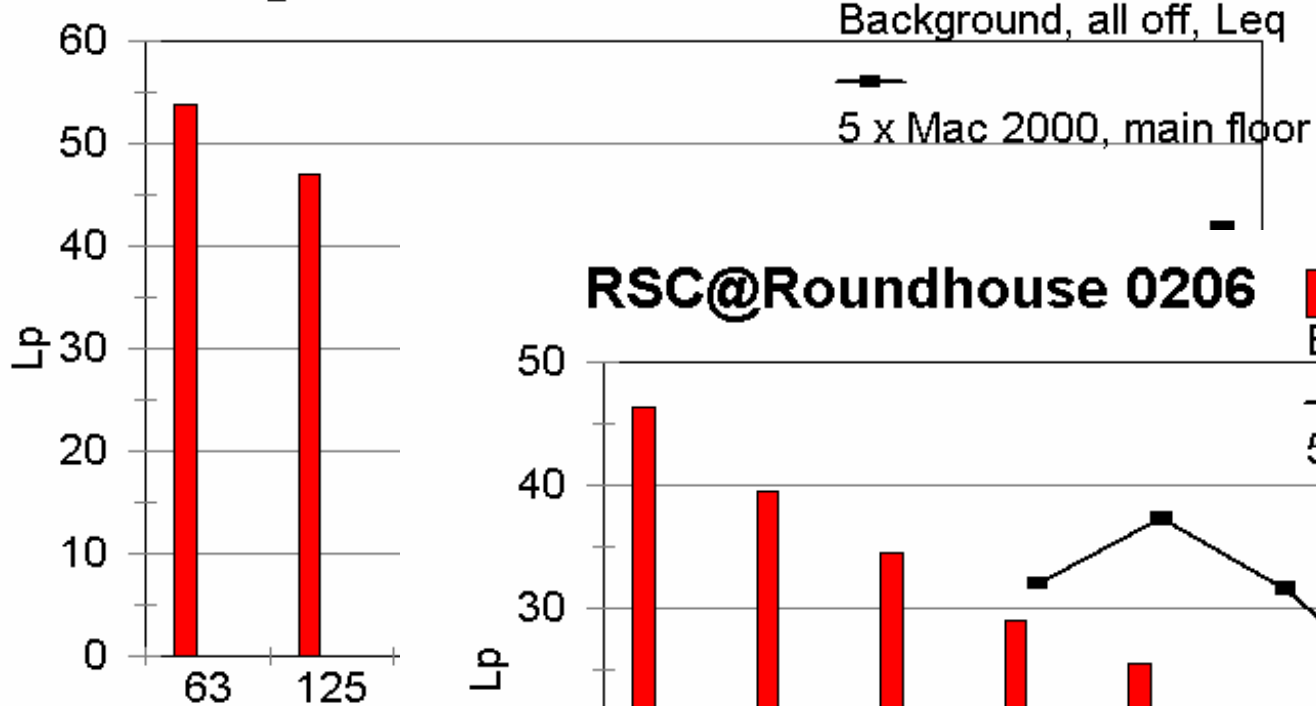


- Sufficiently loud to mask speech
- Unsuitable for use in unamplified (and some amplified) performances

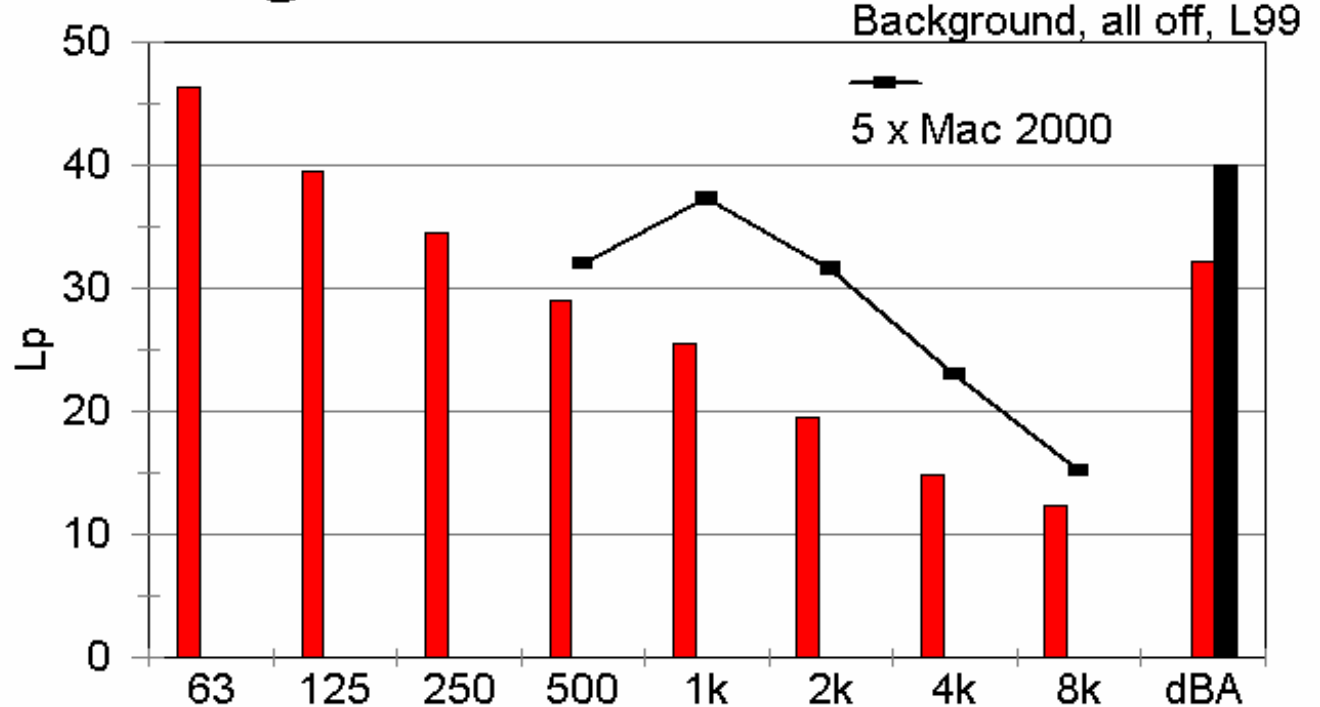


5 x Mac 2000's

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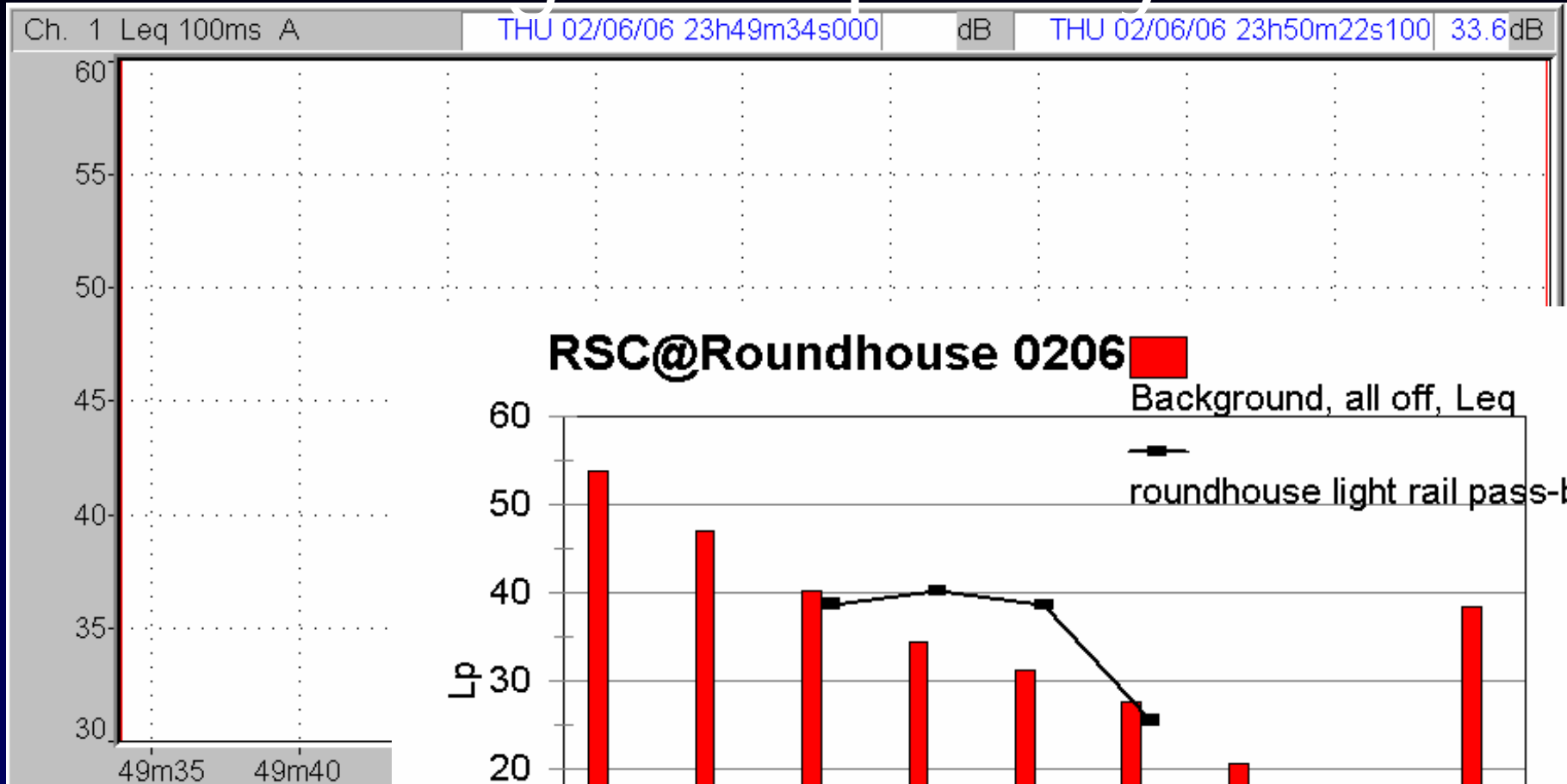


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- The six Mac 2000's are very loud, and sound like a vacuum cleaner.
- One Mac 2000 has very poor lighting capabilities.

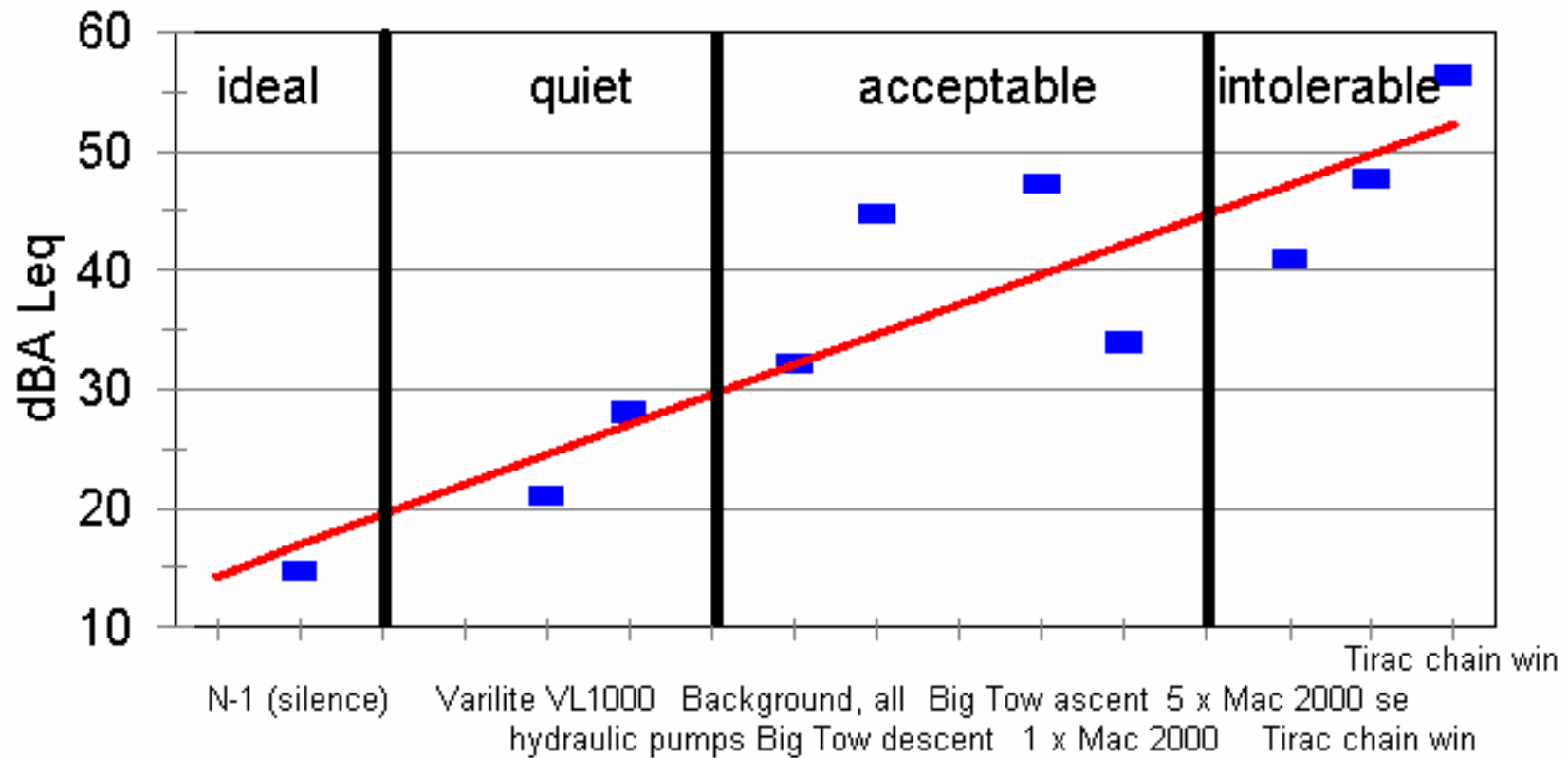
Light rail pass-by



- The sound from the light rail is perceived as less loudness as the frequency increases
- However the sound is still perceived as being more intelligible because of their high-frequencies

Conclusions

Technology Noise Categories
for RSC's "Tempest" at the Roundhouse



- Noise measured as dBA Leq for event-duration