



« Music should strike fire from  
the heart of man, and bring tears  
from the eyes of woman »

*Ludwig van Beethoven*



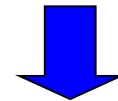
## « In art-therapy the best is good enough »

- In the 1970ies, John Diamond used music therapy for stress reduction, relaxation, phobia etc.
- As from 1979 on, therapeutic effect vanished, sometimes producing opposite effect
- What was the cause?

# New digital recording technology

- In the 1970ies, PCM (digital) magnetic tape recorders became available
- First 33 RPM records made from digital tapes
- Before, only analogue recordings available

Tape recorder



33 RPM vinyl record





# New digital recording technology

- According to John Diamond, the digital tapes were responsible for the loss in therapeutic effect (Reference: [www.drjohndiamond.com](http://www.drjohndiamond.com) )
- **Complexity** of the **analogue** to **digital** conversion from the microphone to the tape
- **Complexity** of the **digital** to **analogue** conversion from the tape to the 33RPM vinyl record



# Technology influences the perception of music

- Recorded music may lead to surprises when used in music therapy
- This holds for non therapeutic use of recorded music too
- Listeners are more sensitive to technical quality of recordings than one may believe

# Examples of our research:

1. Power supplies in audio electronics
2. The use of materials in audio: wood, paper, silver wire
3. Others...





# 1. Power supplies in audio: the mains

- The quality of the power supply starts with the **quality of the mains**
- The mains is a major problem for stable quality for **reproduction of music**
- Why ? **Harmonic distortion** from non linear loads: IT, audio video, green light bulbs etc.

# 1. Power supplies in audio: the mains

- Solutions:



1. Filter transformers

2. Harmonic filters



Not efficient enough given today's mains problems





# 1. Power supplies in audio: the battery

- Batteries are a much **cleaner** source of **power** for audio electronics
- Need special care for **further filtering**
- Regular **charging** according to battery's specifications

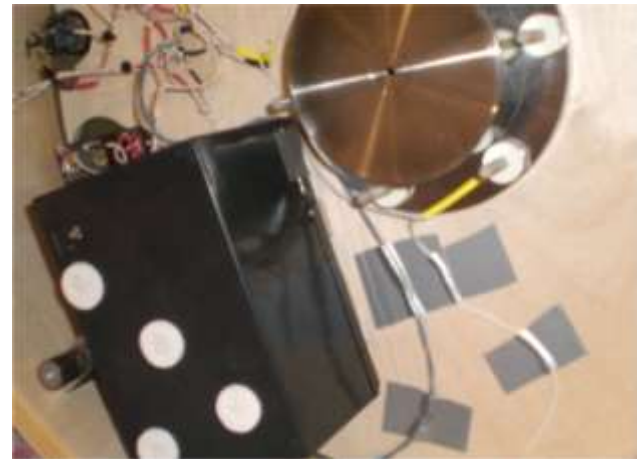
# 1. Power supplies in audio: the battery

- Implementation  
Nr.1:  
Power amplifier  
that feeds  
loudspeakers  
running on lead-  
acid batteries



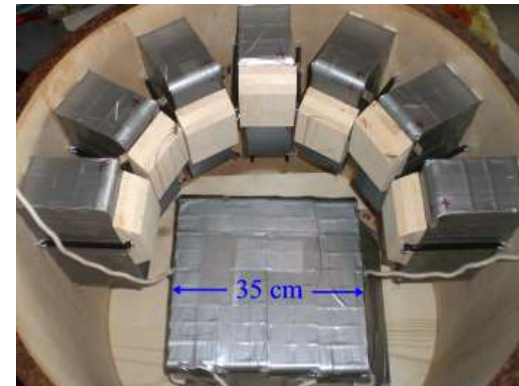
# 1. Power supplies in audio: the battery

- Implementation  
Nr.2:  
High End turntable  
for 33 RPM vinyl  
records running on  
lead-acid batteries



# 1. Power supplies in audio: the battery

- Implementation  
Nr.3:  
High End electron  
tube amplifier  
running on lithium  
batteries





## 2. Materials in audio: wood

- Materials do have an influence on the sound quality of audio equipment
- Wooden cabinets influence the sound:
  1. More **life-like** sound
  2. More **relaxed** sound
  3. Long term listening without **listening fatigue**

## 2. Materials: wood

- Implementation  
Nr.1:  
Cabinet for a MC  
step-up transformer  
used in 33RPM  
record reproduction



## 2. Materials: wood

- Implementation  
Nr.2:  
Cabinet for dipolar  
loudspeaker for  
High End audio  
system



## 2. Materials: wood

- Implementation  
Nr.3:  
Preamplifier for  
High End audio  
system





## 2. Materials: wood

- Implementation  
Nr.4:  
High End tonearm  
for 33RPM record  
players.



## 2. Materials: wood

- Implementation  
Nr.5:  
Platter for 33RPM  
record player.



## 2. Materials: wood

- Implementation  
Nr.6:  
Wooden lenses  
for vibrationnal  
isolation of  
electronics





## 2. Materials: paper

- Materials do influence the quality of sound reproduced by audio equipment
- Paper may replace plastic and produce:
  1. More **life-like** sound
  2. More **relaxed** sound
  3. Long term listening without **listening fatigue**

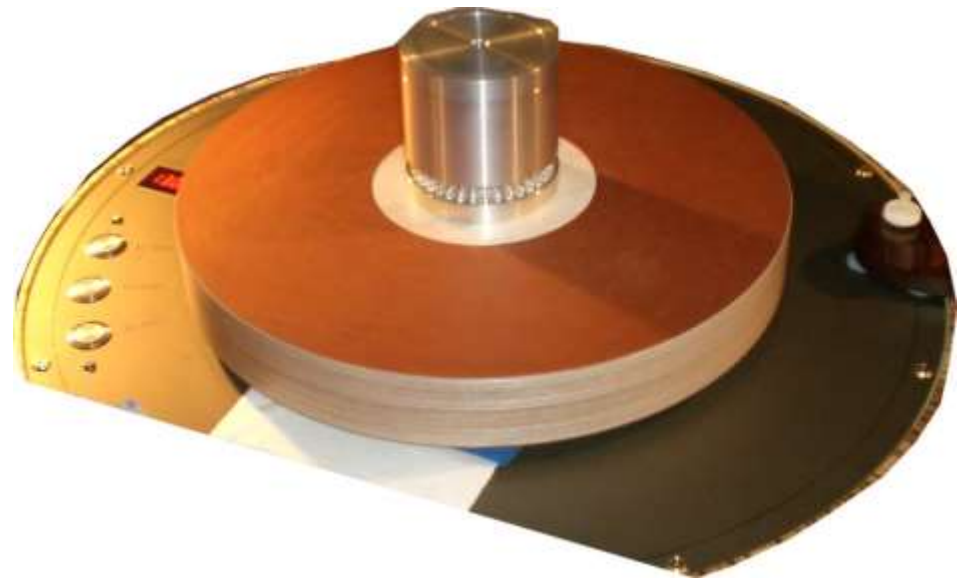
## 2. Materials: paper

- Implementation  
Nr.1:  
Membrane for a  
High End  
loudspeaker.  
Paper that resists  
moisture and  
temperature  
changes



## 2. Materials: paper

- Implementation  
Nr.2:  
Record mat on  
turntable platter.





## 2. Materials in audio: silver wire

- Materials do have an influence on the sound quality of audio equipment
- Silver wire instead of copper wire:
  1. More **resolved** sound
  2. More **dynamics** in sound
  3. Long term listening without **listening fatigue**

## 2. Materials in audio: silver wire

- Implementation  
Nr.1:  
Interconnect cable  
and loudspeaker  
cable using 99.99%  
silver wire (cryo  
treated ) and white  
cotton isolation





## 2. Materials in audio: silver wire

- Implementation  
Nr.2:  
Internal wiring of a  
tube Phono  
amplifier using  
99.99% silver wire  
(cryo treated) and  
cotton isolated



## 2. Materials in audio: silver wire

- Implementation  
Nr.3:  
Turntable motor  
entirely wound  
using 99.99% silver  
wire (cryo treated)

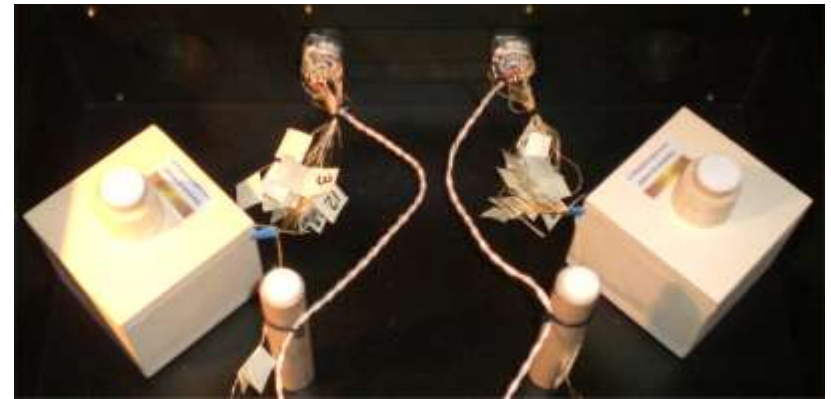


## 2. Materials in audio: silver wire

- Implementation

Nr.4:

Volume setting  
transformer entirely  
wound using  
99.99% silver wire  
(cryo treated)





### 3. Other fields of research...

- Cryogenic treatment of materials
- Electromagnetic interferences
- Computer as digital front ends

*Audio Consulting*

*'Emotion in Sound'*

Where are we located?



In Switzerland

[www.audio-consulting.ch](http://www.audio-consulting.ch)





In Switzerland

[www.audio-consulting.ch](http://www.audio-consulting.ch)



Where are we located?



In Switzerland

[www.audio-consulting.ch](http://www.audio-consulting.ch)



Where are we located?



Close to Geneva on the Lemman Riviera

[www.audio-consulting.ch](http://www.audio-consulting.ch)



*Audio Consulting*  
*'Emotion in Sound'*

Where are we located?



Commugny close to Coppet

[www.audio-consulting.ch](http://www.audio-consulting.ch)

## Where are we located?



...where we also get cold winters from time to time