



ifj

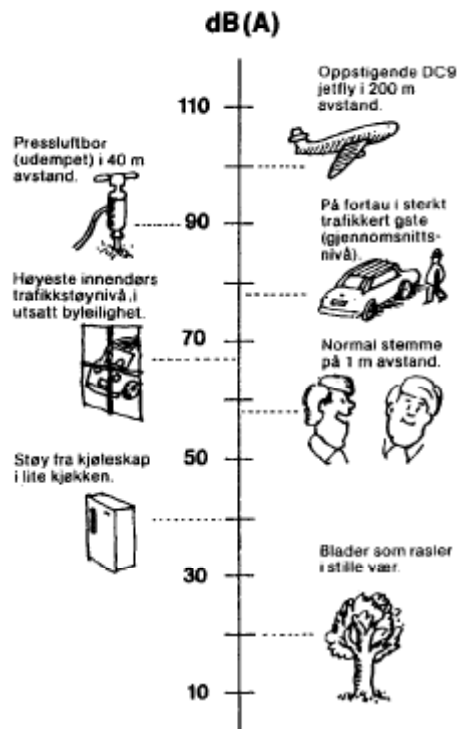
Dynamikk prosessering (kap7.7)

Sverre Holm



UNIVERSITETET
I OSLO

Stor dynamikk i lyd



dB relativt til 20 μ Pa

- Dynamikk i musikk ~ 80 dB
- Maks komfortnivå ~ 90-100 dB
- Ofte mindre avstand mellom bakgrunnsstøy og maks-nivå enn dynamikken i musikken
-
- Nivåkompresjon

Dynamikk i typiske omgivelser

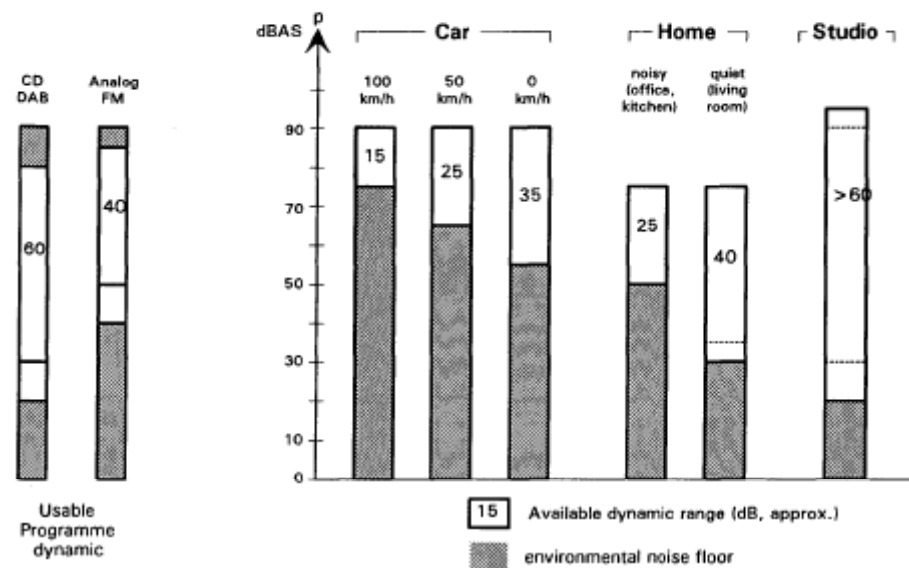


Figure 1 Reproduced dynamic range

W. Hoeg, N. Gulchrist, Dynamic range control music/speech control in DAB, AES UK DAB Conference, 1995

15. oktober 2013

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Nivåkompresjon og -ekspansjon

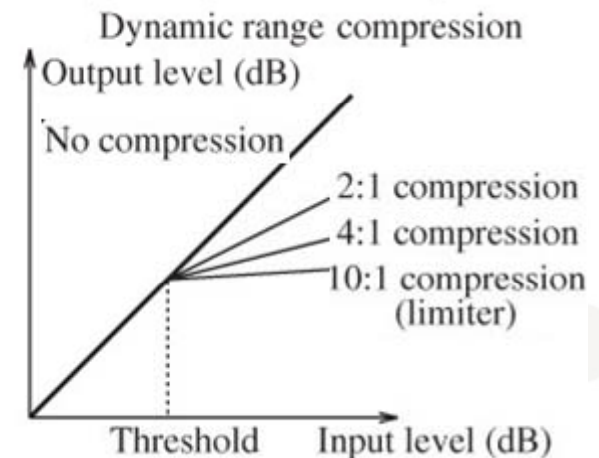
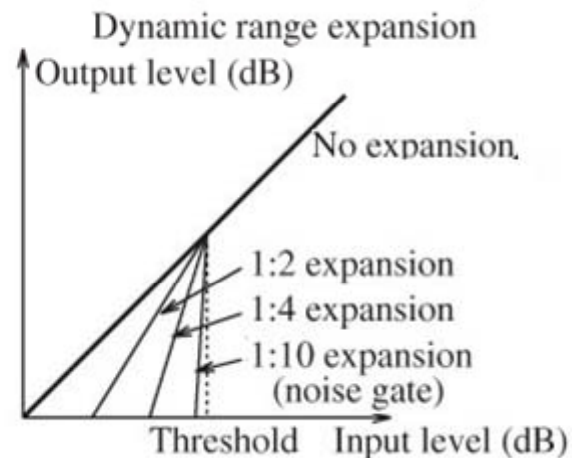
Ekspander

- "Opphever" en kompressor
- Noise gate: en måte for å slippe å ta opp støy under opptak

Kompressor

- Lave nivåer: gain=1
- Høye nivåer: gain<1
- Kompresjon på 10:1 eller mer er en begrenser (limiter)

FIGURE 7.32
Input-output characteristics of dynamic-range processors

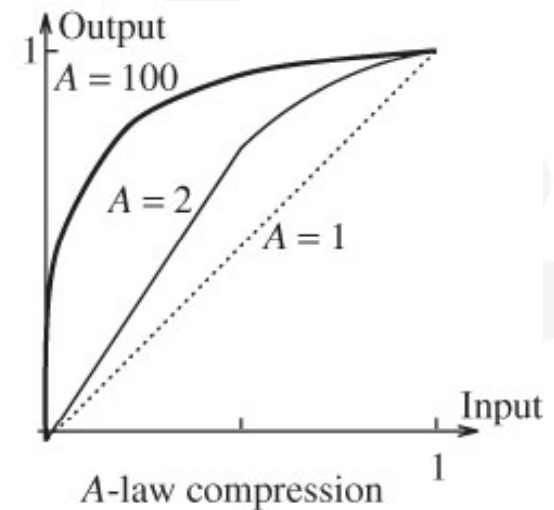
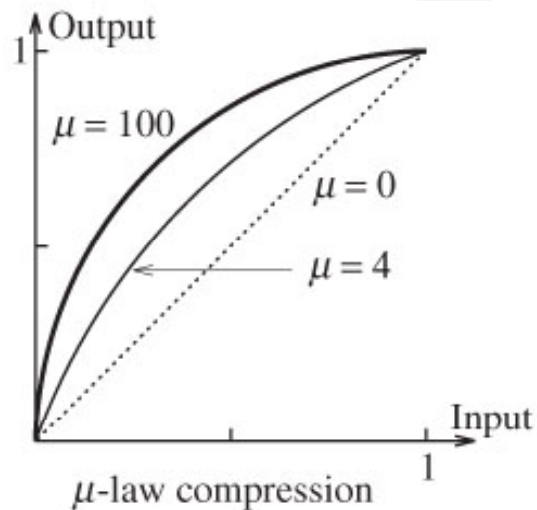


NB! Bokas fig 7.32 har byttet om mellom kompresjon og ekspansjon

Kompresjon i telefon

- μ -lov ($\mu=255$) i Nord-Amerika, A-lov ($A=100$) i Europa
- Øker typisk dynamikken med 4 bit: 8-bits A/D-konverterer får samme dynamikk som en 12-bits konverterer

FIGURE 7.35
Characteristics of μ -law and A-law compressors



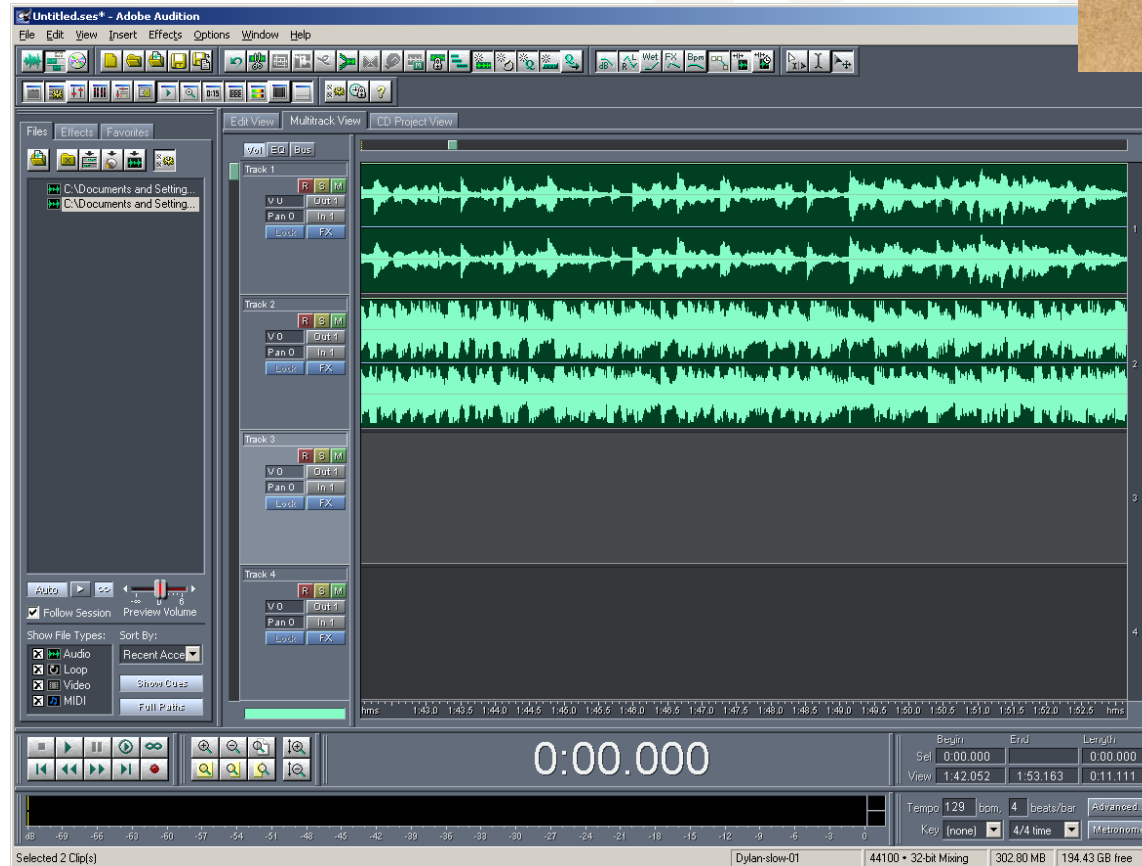
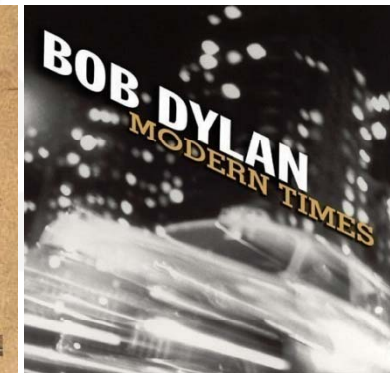
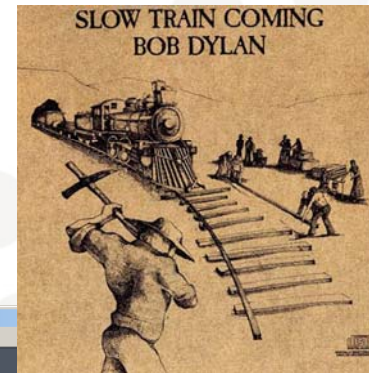
Kompresjon i digital musikk


- Amplitudekompresjon
- Klipping

- Se også: "Vinyllydens revansj"

<http://blogg.uio.no/mn/ifi/innovasjonsteknologi/content/vinyllydens-revansj>

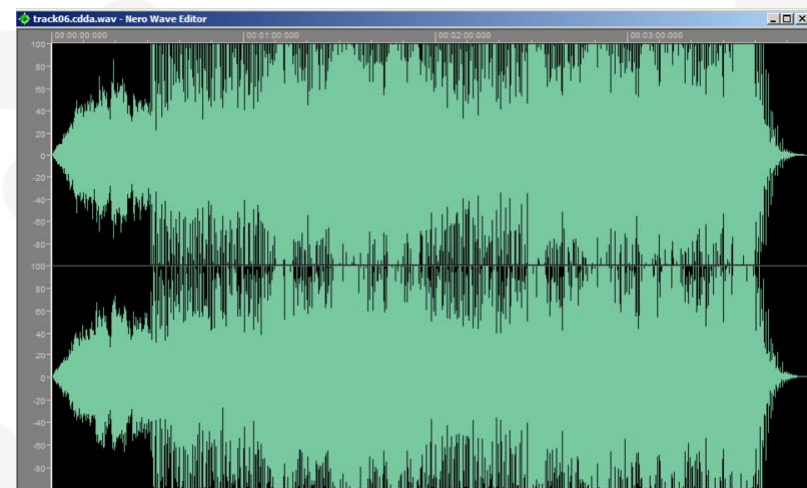
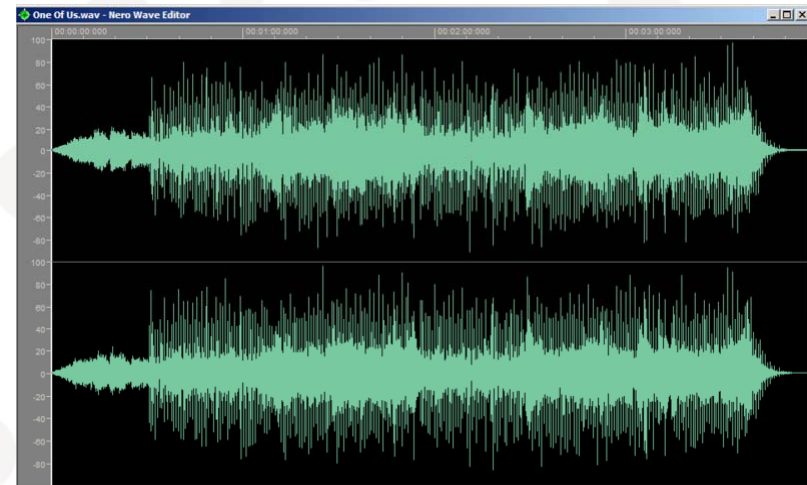
Kompresjon over 25 år



- Legg merke til lydnivå (10-11 sek)
- Øverst: Slow Train Coming (LP 1979):
Middelverdi -22 dB
- Nederst: Thunder on the Mountain, 2006:
Middelverdi -11.5dB 
- "The loudness war":
10-11 dB sterkere ¹⁰

ABBA: "One Of Us" 1981 – 2005

- ABBA's "One Of Us", from their 1981 album The Visitors (released on CD in 1983)
- The first image is taken from the original Polydor CD release.
- The second image is taken from the 2005 remaster (part of the Complete Studio Recordings box set).
 - There is a heavy amount of compression and the dynamics and "snap" of the original track have been lost as a result.
- http://en.wikipedia.org/wiki/Loudness_war



03-Graffiti.wav - Adobe Audition

File Edit View Effects Generate Analyze Favorites Options Window Help

Files Effects Favorites

03-Graffiti.wav

Maximo Park: "Graffiti" from the album "A Certain Trigger"

Original from CD. Peak level is $-0,4\text{dBFS}$

Bjørn Aarseth, NRK Challenges in audio production with new distribution formats, IBC 2007

1:24.268

	Begin	End	Length
Sel	1:20.000		0:00.000
View	0:00.000	3:05.266	3:05.266

Playing L: -5dB @ 2:52.252 44100 • 16-bit • Stereo 31.16 MB 56.02 GB free

mpark128.wav - Adobe Audition

File Edit View Effects Generate Analyze Favorites Options Window Help

Files Effects Favorites

- 03-Graffiti.wav
- 06-Kari Bremnes _ En elsker i ...
- mpark128.wav

0:00.000

0:00.000 3:05.312 3:05.312

Stopped R: 0dB @ 2.46.586 44100 • 16-bit • Stereo 31.17 MB 59.17 GB free

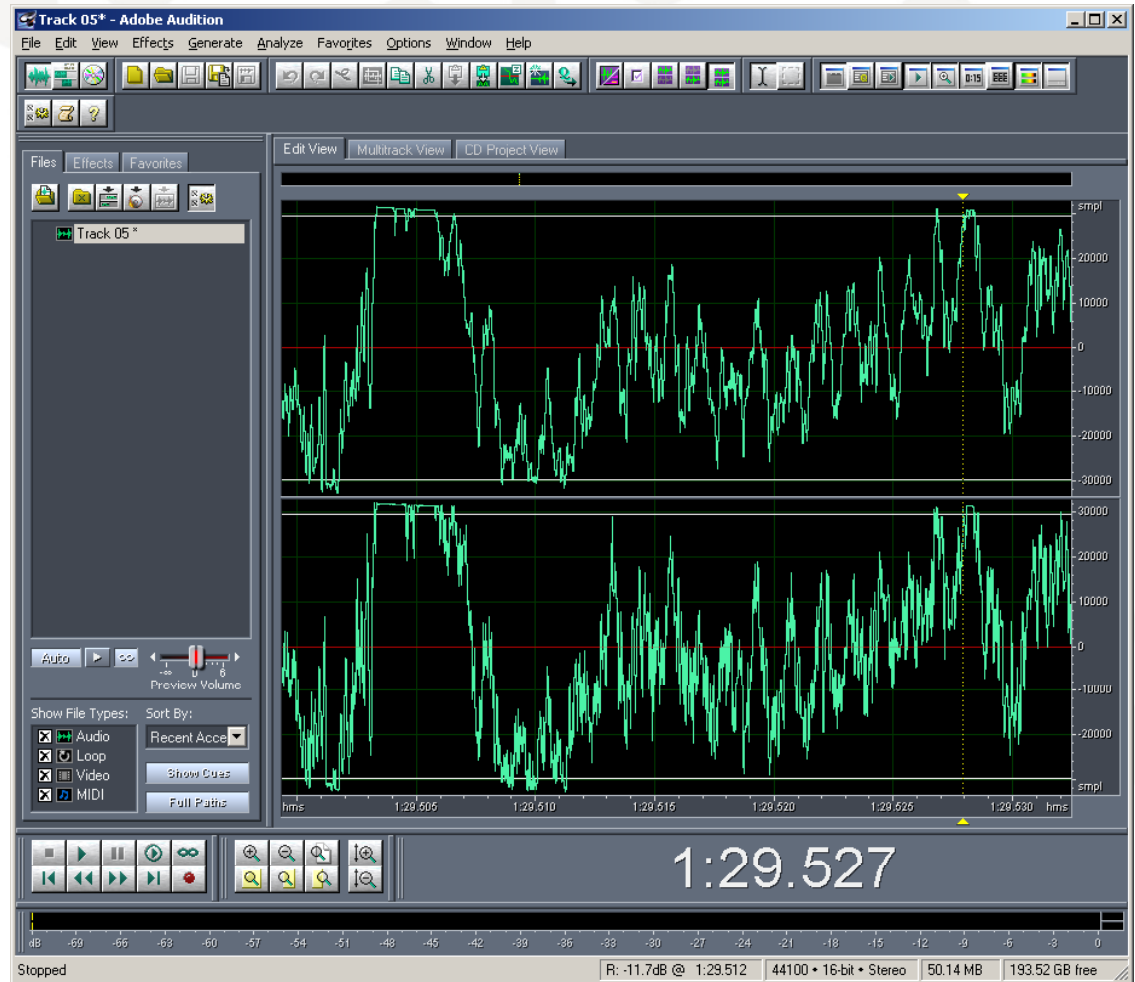
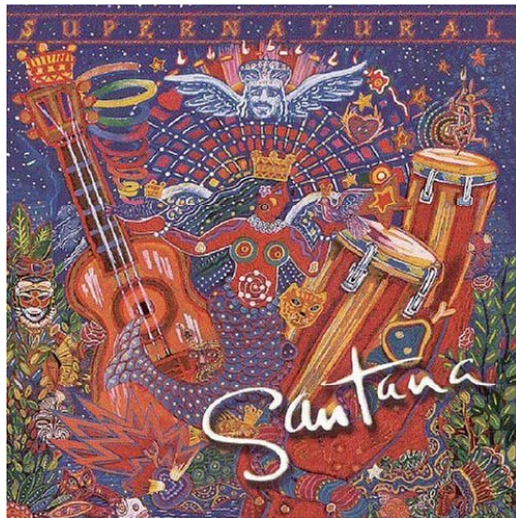
The screenshot shows the Adobe Audition interface with a waveform of an audio file. The waveform is mostly flat, indicating a silent or very quiet section of the audio. The text is overlaid on the waveform. The text is in a bold, black, sans-serif font. The text is centered horizontally and vertically within the waveform area. The text is as follows:

Maximo Park: "Graffiti" from the album "A Certain Trigger"
Encoded and decoded using MPEG-1 L2 @ 128 kbps
joint stereo. The audio clips hundreds of times.

Bjørn Aarseth, NRK
Challenges in audio production
with new distribution formats, IBC 2007

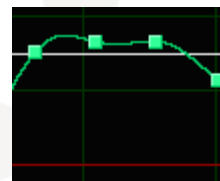
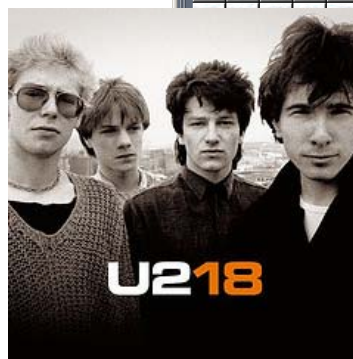
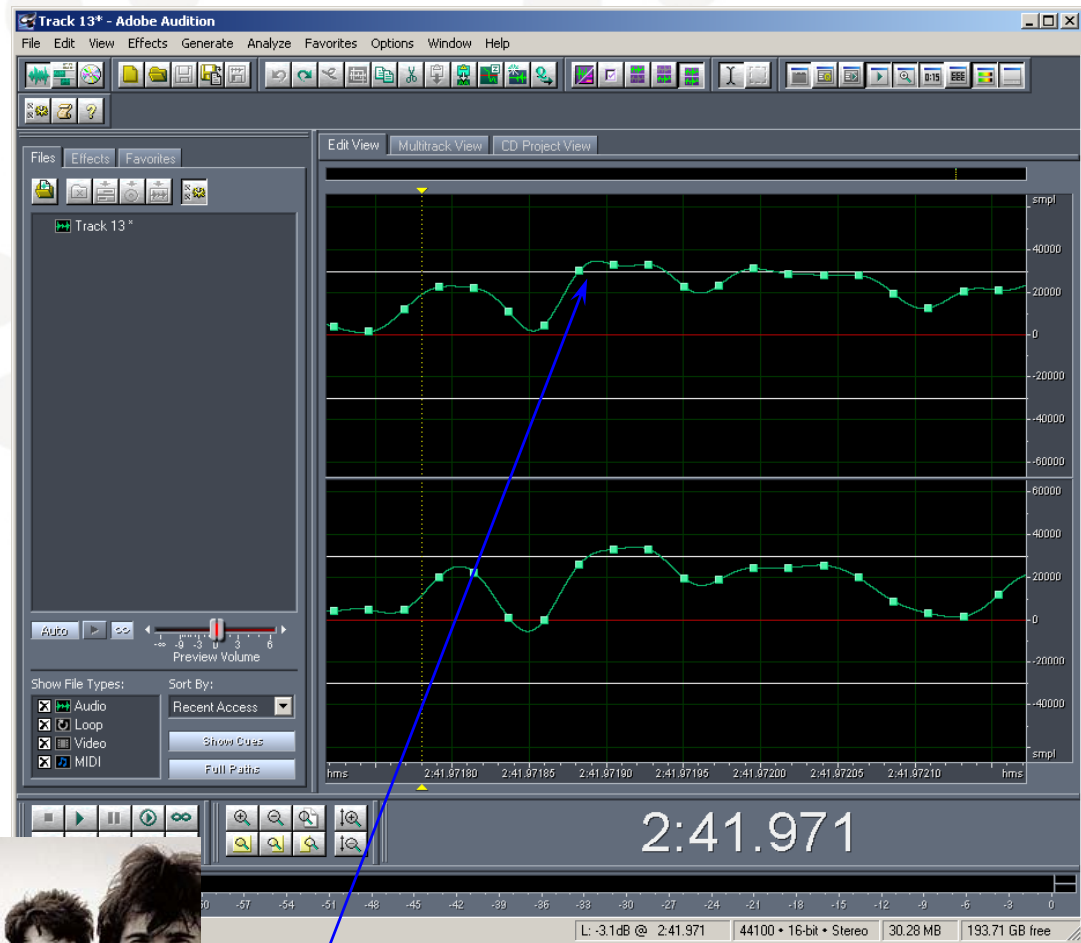
Klipping

- Santana: Smooth, 1999
- **Left Right**
- Min Sample Value:
-32111 -32041
- Max Sample Value:
31218 31804



Klipping

- Hele låten:
 - Max Sample Value: 32767 32767
 - Possibly Clipped: 9276 4901
- Kan lett gi overstyring i
 - Oppsamplende D/A-konvertere
 - Sample-rate konvertere (ASRC)
 - Etter koding/dekoding (mp3, aac, ...) kan overstyringen øke
- U2: One (1992)
 - fra U218 Singles



Interpolert verdi > 32767

Hvem er sluttbrukere av musikk?

1. Hi-fi i stue, inkl audiofiles anlegg
2. Mono TV og kjøkkenradio
3. Ipod, walkman o.l. med hodetelefoner
4. Bilstereo
5. Boom-box: Bærbar stereo, smalt lydbilde, spilles rett i ansiktet; inkl stereo TV.
6. Boom-van: Høyeffekts stereosystem med mange høyttalere, inkl subwoofere.

Ofte mer bakgrunnsstøy og/eller dårligere lydanlegg

Vinyl



Digital lyd

- http://www.moultonlabs.com/more/starting_over2/P7/

Turn me up!



- Bringing dynamics back to music
 - Turn Me Up!™ - non-profit music industry organization
 - give artists back the choice to release more dynamic records.
 - To be clear, it's not our goal to discourage loud records; they are, of course, a valid choice. for many artists.
 - We simply want to make the choice for a more dynamic record an option for artists.
 - ... there are many other artists who feel their music would be better served by a more dynamic record, but who don't feel like that option is available to them.
- <http://turnmeup.org/>

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