

Audio 3.1 DeltaKompression

d)

i. Fehler bei Quantisierung von 1

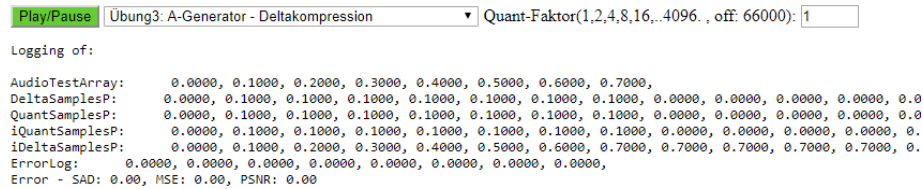


Figure 1: quantisierung: 1

ii. Fehler bei Quantisierung von 8

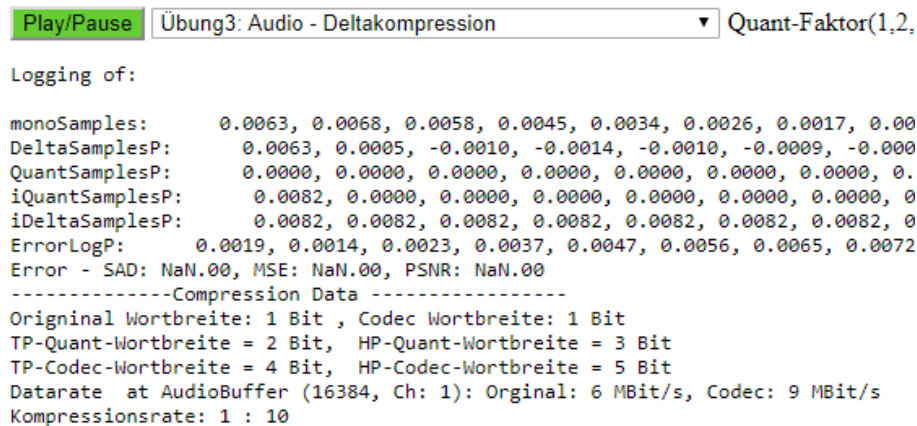


Figure 2: quantisierung: 8

Audio 3.2 SubbandKompression

c)

i. Fehler bei Quantisierung von 1

ii. Fehler bei Quantisierung von 8

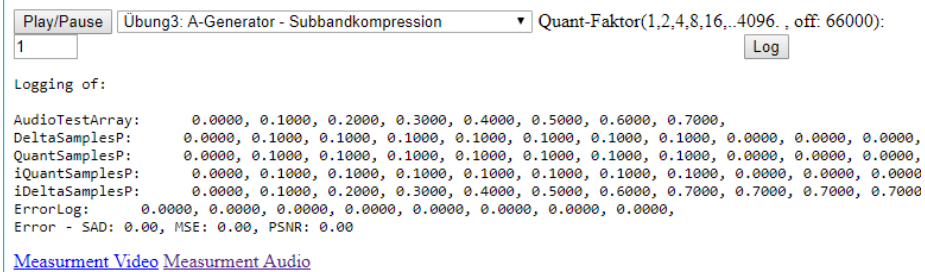


Figure 3: quantisierung: 1

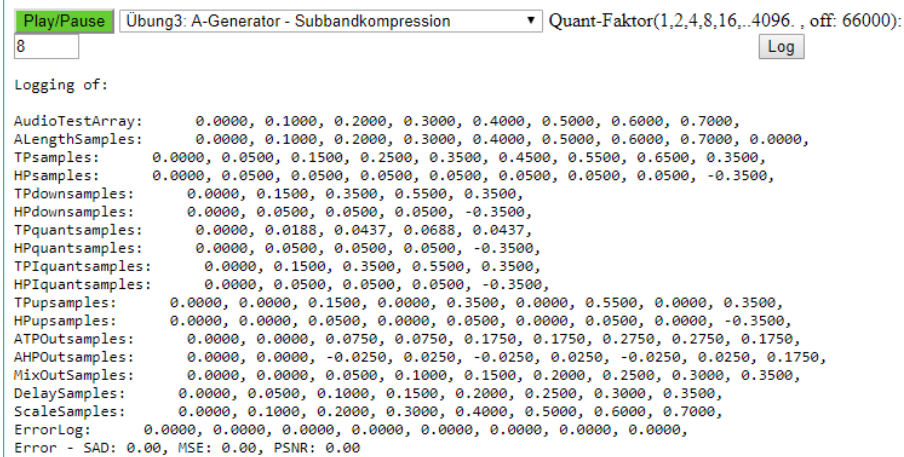


Figure 4: quantisierung: 8

Audio 3.3 FFT

c)

i. Fehler bei Quantisierung von TP: 1 HP: 1 Grenzwert: 1

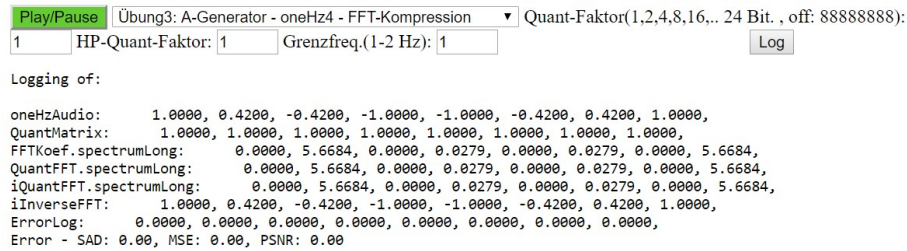


Figure 5: quantisierung: 1

ii. Fehler bei Quantisierung von TP: 16 HP: 32 Grenzwert: 1

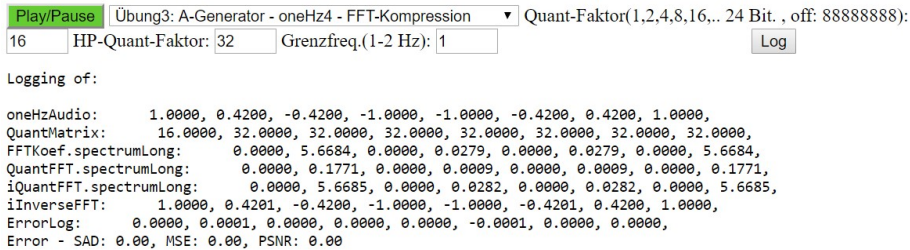


Figure 6: quantisierung: 8

Audio 3.4 Delta

b) höchste Quantisierung bei bester Wahrnehmungs-Qualität

1500

c) Wortbreite bei der optimalen Quantisierung

16 bit

d) Datenrate bei 48kHz

Unkomprimierte Datenrate:

sample rate * word size * channels

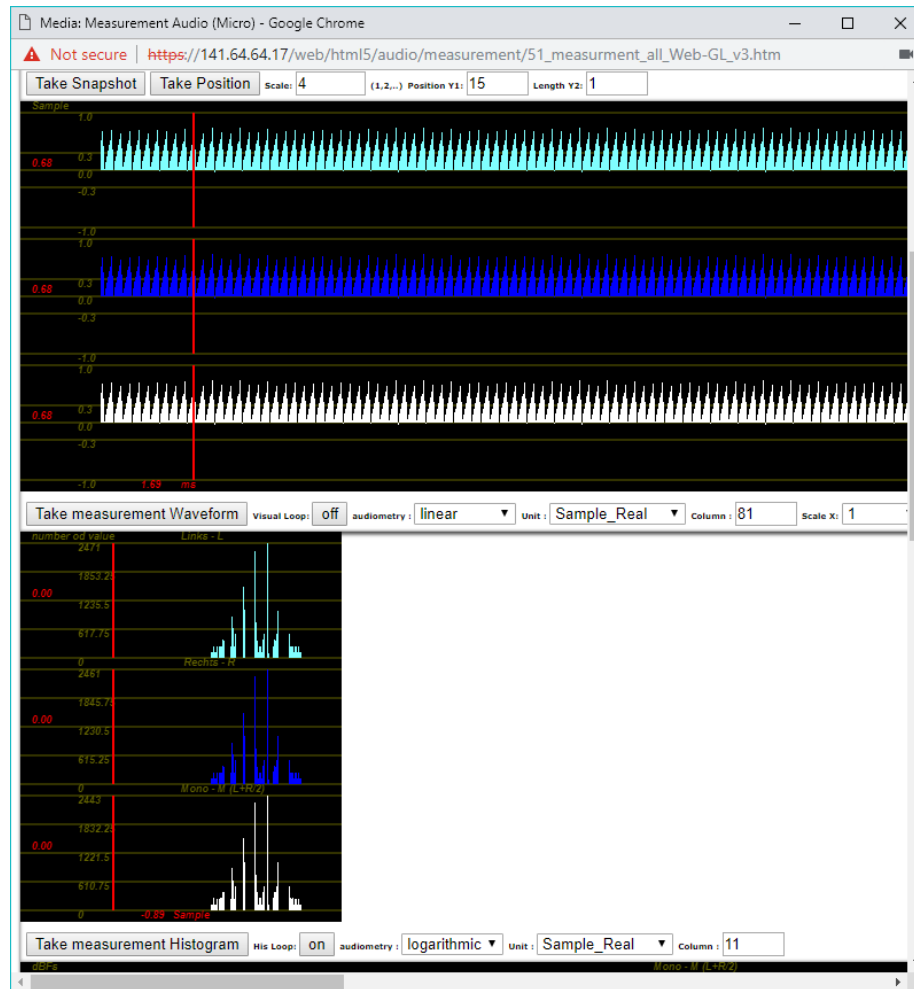


Figure 8: measurement delta 1

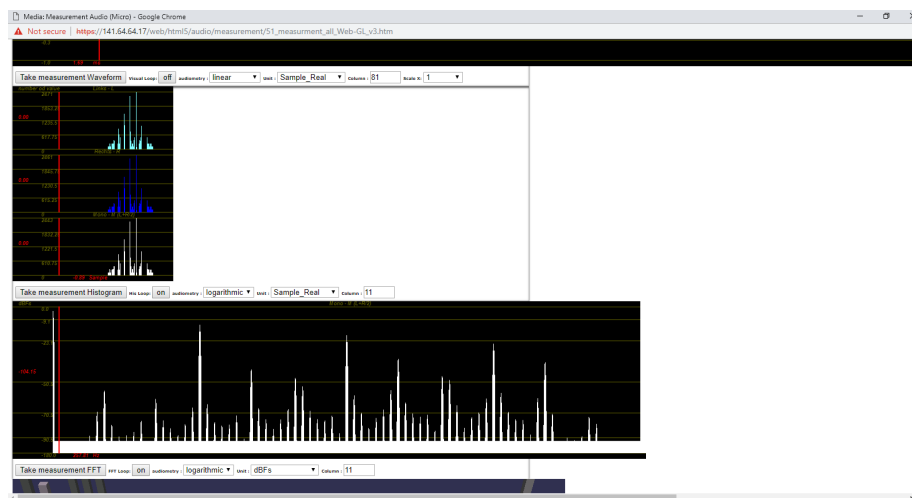


Figure 9: measurement delta 2

Play/Pause Übung3: Audio - Deltakompression ▼ Quant-Faktor(1,2,

Logging of:

```

monoSamples:      0.0063, 0.0068, 0.0058, 0.0045, 0.0034, 0.0026, 0.0017, 0.00
DeltaSamplesP:    0.0063, 0.0005, -0.0010, -0.0014, -0.0010, -0.0009, -0.000
QuantSamplesP:    0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.
iQuantSamplesP:   0.0082, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0
iDeltaSamplesP:   0.0082, 0.0082, 0.0082, 0.0082, 0.0082, 0.0082, 0.0082, 0
ErrorLogP:        0.0019, 0.0014, 0.0023, 0.0037, 0.0047, 0.0056, 0.0065, 0.0072
Error - SAD: NaN.00, MSE: NaN.00, PSNR: NaN.00
-----Compression Data -----
Original Wortbreite: 1 Bit , Codec Wortbreite: 1 Bit
TP-Quant-Wortbreite = 2 Bit, HP-Quant-Wortbreite = 3 Bit
TP-Codec-Wortbreite = 4 Bit, HP-Codec-Wortbreite = 5 Bit
Datarate at AudioBuffer (16384, Ch: 1): Original: 6 MBit/s, Codec: 9 MBit/s
Kompressionsrate: 1 : 10

```

Figure 10: measurement delta quant 8

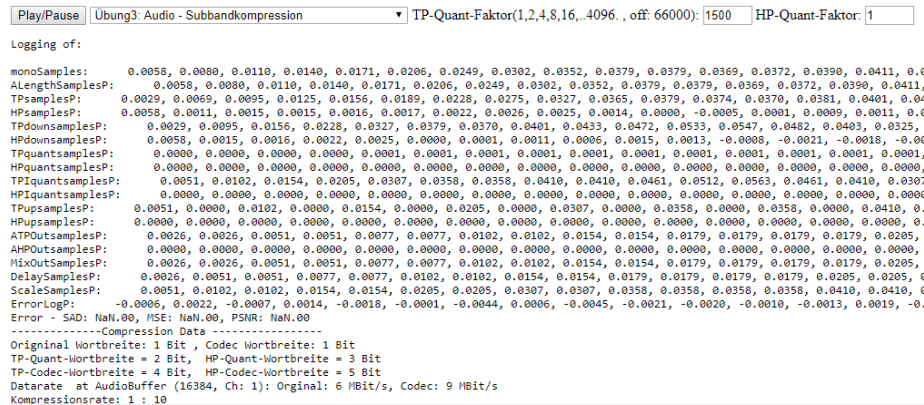


Figure 11: quantisierung: 8

d) Datenrate bei 48kHz

48000hz * 1 channel * 11 bit

Berechnen der Compression Ratio:

e) Kompression

16:11 weil 16 bit auf 11 bit reduziert wurden.

f) Measurement

Audio 3.6 FFT

b) höchste Quantisierung bei bester Wahrnehmungs-Qualität

ca 66000

c) Wortbreite bei der optimalen Quantisierung

TP 24-16bit = 8 Bit

HP = 0 bit

d) Datenrate bei 48kHz

1000 Koeffizienten * 2 (real & imaginär) * 3 Blöcke * 1 * 8 Bit

= 48.000

e) Kompression

2000 * 8 Bit

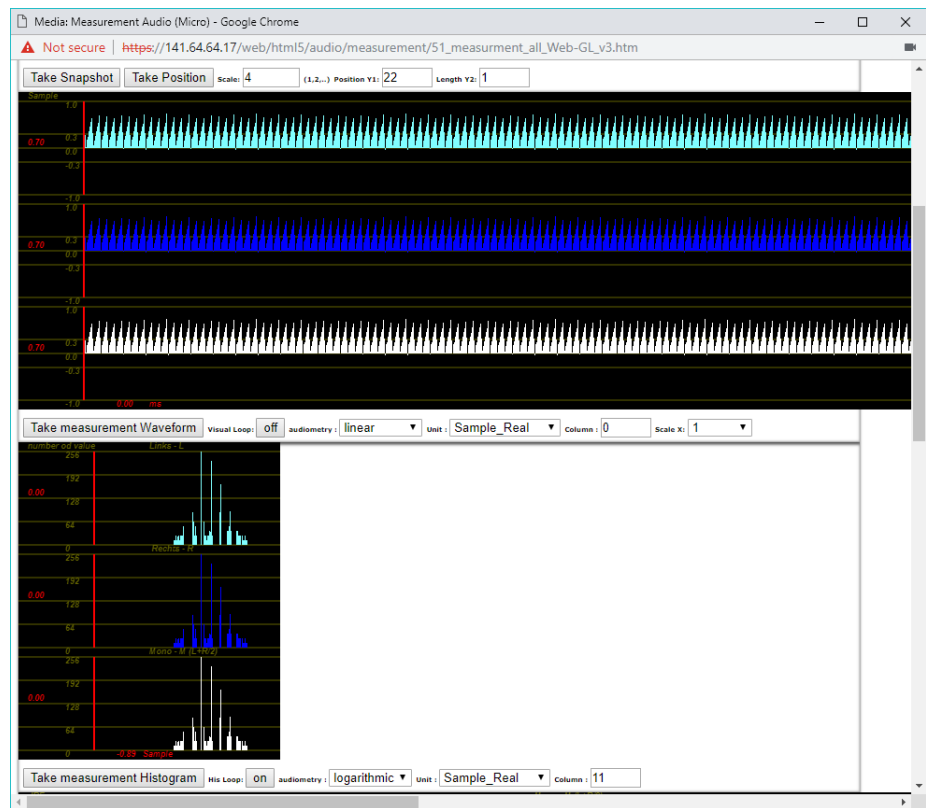


Figure 12: measurement subband 1

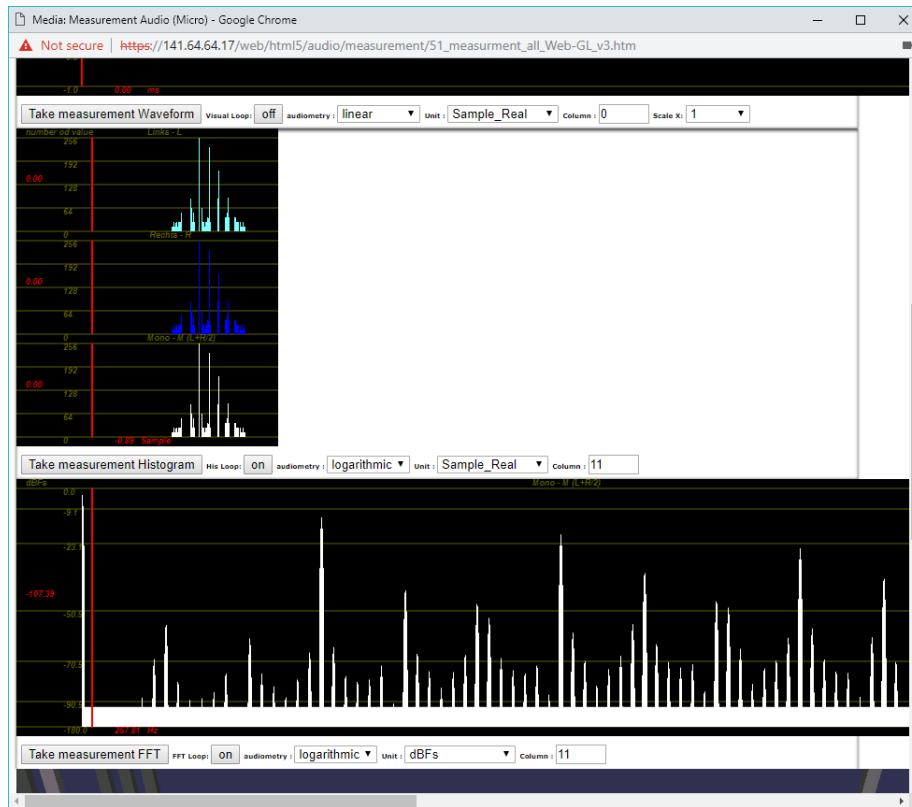


Figure 13: measurement subband 2

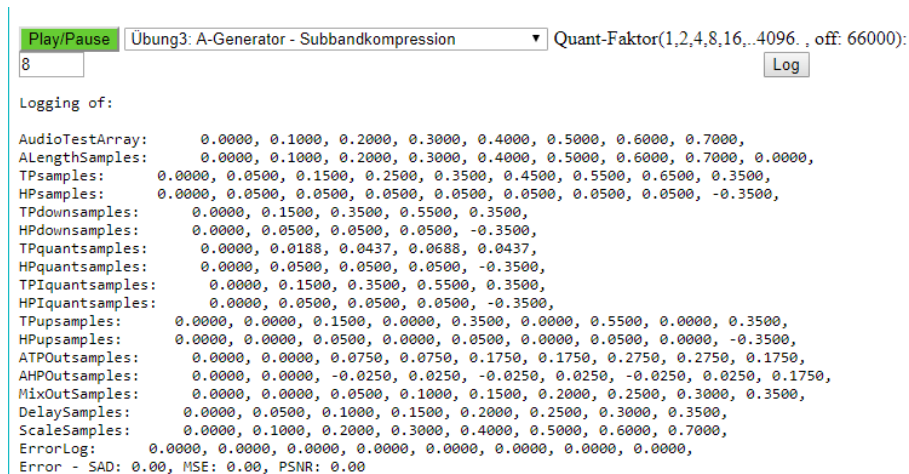


Figure 14: measurement subband quant 8

Übung3: Audio - Audio16384/2 - FFT-Kompression ▾ TP-Quant-Faktor(1,2,4,8,16... 24 Bit , off: 88888888): HP-Quant-Faktor: Grenzfrequ.(1-16000/2 Hz):

Logging of:

```

monoSamples:      -0.0032, -0.0030, -0.0029, -0.0030, -0.0032, -0.0034, -0.0038, -0.0039, -0.0039, -0.0040, -0.0039, -0.0037, -0.0036, -0
QuantMatrixP:      66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000
FFTKoeff.spectrumLong: 0.0763, 0.8991, 0.1085, 0.8462, 0.5685, 0.2943, 0.7600, 0.2304, 0.5446, 0.5107, 0.7018, 0.0653, 0.6209, 0.497
QuantFFTP.spectrumLong: 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.00
iQuantFFTP.spectrumLong: 0.0000, 0.6600, 0.0000, 1.3200, 0.6600, 0.0000, 0.6600, 0.0000, 0.0000, 0.6600, 0.6600, 0.6600, 0.6600, 0.0
iInverseFFT:        -0.0006, -0.0007, -0.0008, -0.0009, -0.0010, -0.0011, -0.0012, -0.0012, -0.0013, -0.0014, -0.0014, -0.0015, -0.0015, -
ErrorLogP:          0.0025, 0.0023, 0.0021, 0.0021, 0.0022, 0.0024, 0.0026, 0.0026, 0.0026, 0.0026, 0.0025, 0.0022, 0.0022, 0.0024, 0.0027, 0
Error - SAD: NaN.00, MSE: NaN.00, PSNR: NaN.00
-----Compression Data -----
Original Wortbreite: 1 Bit , Codec Wortbreite: 1 Bit
TP-Quant-Wortbreite = 2 Bit, HP-Quant-Wortbreite = 3 Bit
TP-Codec-Wortbreite = 4 Bit, HP-Codec-Wortbreite = 5 Bit
Datarate at AudioBuffer (16384, Ch: 1): Original: 6 MBit/s, Codec: 9 MBit/s
Kompressionsrate: 1 : 10

```

Figure 15: quantisierung: 8

1 : 16

f) Measurement

Übung3: A-Generator - oneHz4 - FFT-Kompression ▾ Quant-Faktor(1,2,4,8,16... 24 Bit , off: 88888888): HP-Quant-Faktor: Grenzfrequ.(1-2 Hz):

Logging of:

```

oneHzAudio:        1.0000, 0.4200, -0.4200, -1.0000, -1.0000, -0.4200, 0.4200, 1.0000,
QuantMatrixP:      NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000
FFTKoeff.spectrumLong: 0.0000, 5.6684, 0.0000, 0.0279, 0.0000, 0.0279, 0.0000, 5.6684,
QuantFFTP.spectrumLong: 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
iQuantFFTP.spectrumLong: 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
iInverseFFT:        0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
ErrorLog:           -1.0000, -0.4200, 0.4200, 1.0000, 1.0000, 0.4200, -0.4200, -1.0000,
Error - SAD: 5.68, MSE: 0.59, PSNR: 3.81
-----Compression Data -----
Original Wortbreite: 1 Bit , Codec Wortbreite: 1 Bit
TP-Quant-Wortbreite = 2 Bit, HP-Quant-Wortbreite = 3 Bit
TP-Codec-Wortbreite = 4 Bit, HP-Codec-Wortbreite = 5 Bit
Datarate at AudioBuffer (16384, Ch: 1): Original: 6 MBit/s, Codec: 9 MBit/s
Kompressionsrate: 1 : 10

```

Figure 16: fft1

Übung3: Audio - Audio16384/2 - FFT-Kompression ▾ TP-Quant-Faktor(1,2,4,8,16... 24 Bit , off: 88888888): HP-Quant-Faktor: Grenzfrequ.(1-16000/2 Hz):

Logging of:

```

monoSamples:      0.0137, 0.0361, -0.0106, -0.0623, -0.0313, 0.0531, 0.0655, -0.0076, -0.0639, -0.0404, 0.0049, 0.0104, 0.0069, 0.0096, -0.0005, -0.0166, -0.0260, -0.0150, 0.0021,
QuantMatrixP:      66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000.0000, 66000
FFTKoeff.spectrumLong: 3.1541, 3.3183, 2.4186, 2.4756, 2.4391, 2.8575, 2.2651, 1.9390, 2.6207, 2.4696, 2.7828, 2.9968, 2.2752, 2.0105, 3.7327, 3.2008, 2.8544, 1.7742, 2.6123,
QuantFFTP.spectrumLong: 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
iQuantFFTP.spectrumLong: 3.3000, 3.3000, 1.9800, 1.9800, 2.6400, 2.6400, 1.9800, 1.9800, 2.6400, 2.6400, 3.3000, 3.3000, 1.9800, 1.9800, 3.9600, 2.6400, 2.6400, 1.9800, 2.6400,
iInverseFFT:        -0.0006, -0.0015, -0.0021, -0.0025, -0.0028, -0.0029, -0.0029, -0.0028, -0.0026, -0.0025, -0.0023, -0.0021, -0.0020, -0.0020, -0.0021, -0.0023, -0.0026, -0.0030,
ErrorLogP:          -0.0144, -0.0376, 0.0005, 0.0598, 0.0295, -0.0560, -0.0684, 0.0048, 0.0613, 0.0300, -0.0071, -0.0123, -0.0089, -0.0116, -0.0016, 0.0163, 0.0034, 0.0120, -0.0095, -0
Error - SAD: NaN.00, MSE: NaN.00, PSNR: NaN.00
-----Compression Data -----
Original Wortbreite: 1 Bit , Codec Wortbreite: 1 Bit
TP-Quant-Wortbreite = 2 Bit, HP-Quant-Wortbreite = 3 Bit
TP-Codec-Wortbreite = 4 Bit, HP-Codec-Wortbreite = 5 Bit
Datarate at AudioBuffer (16384, Ch: 1): Original: 6 MBit/s, Codec: 9 MBit/s
Kompressionsrate: 1 : 10

```

Figure 17: fft2

Play/Pause
Übung3: A-Generator - WhiteNoise - FFT-Kompression ▾
TP-Quant-Faktor(1,2,4,8,16... 24 Bit , off. 88888888):
HP-Quant-Faktor:
Grenzfrequ (1-16000² Hz):

Logging of:

```

monoSamples:      0.5472, 0.8186, -0.8860, 0.6838, -0.4255, -0.0135, -0.3372, 0.8877, -0.5637, -0.9682, -0.4231, 0.4750, 0.3372, 0.9736, -0.7438, -0.8986, 0.6872, 0.7917,
QuantMatrix:      NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000, NaN.0000,
FFTKoeff.spectrumLong:  45.0465, 31.3870, 36.2377, 28.2854, 36.4623, 40.7281, 42.5599, 49.9187, 83.6777, 150.1594, 8.3577, 22.6046, 8.6920, 47.4584, 149.6251, 18.1295, 93.8457, 41.9810,
QuantFFT.spectrumLong:  0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
iQuantFFT.spectrumLong:  0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
iInverseFFT:      0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
ErrorLog:         -0.5472, -0.8186, 0.8860, -0.6838, 0.4255, 0.0135, 0.3372, -0.8877, 0.5637, 0.9682, 0.4231, -0.4750, -0.3372, -0.9736, 0.7438, 0.8986, -0.6872, -0.7917,
Error - SAd:      4115.54, MSE: 0.134, PSNR: 8.24

```

Figure 18: fft3