

# DYNAMIC RANGE

EMANUELE COSTANTINI

Dynamic Range, the Noise/Signal ratio or the quantization noise can be calculated with the following formula:

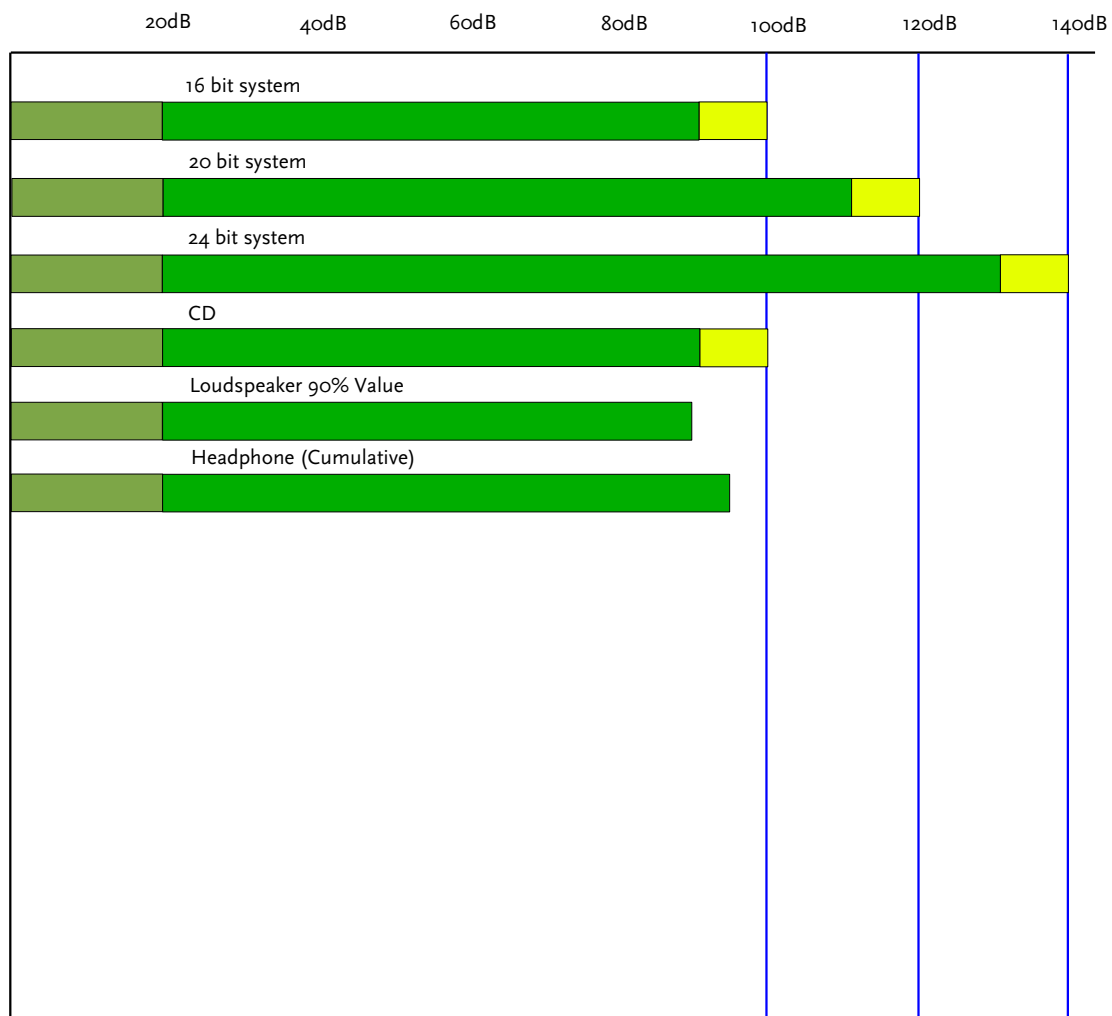
$$S/N[dB] = 6n + 2$$

where “n” is the quantization expressed in bits.

The result has negative value and correspond to the RMS value of the quantization noise referred to  $\text{0dB}_{FS}$  of the program level (clip level of the digital system).

The relationship between the measurements follow the table:

	16 bit	20 bit	24 bit
RMS noise voltage level /dB	-98	-122	-146
Fremdspannungpegel DIN 45 405 /dB	-90	-114	-138
Noise Voltage Level ITU 468 / $\text{dB}_{qps}$	-86	-110	-134



## REFERENCES

### READINGS

dott. Simone Corelli - Appunti (in via di sviluppo) di tecnica del suono: livelli

Gerhard Spikofski and Siegfried Klar – Levelling and Loudness in radio and television broadcasting

### AES PAPERS

Convention Paper 5538: “On levelling and loudness problems at television and radio broadcast studios” - Siegfried Klar, Gerhard Spikofski

### SPECIFICATIONS

ARD HFBL-K Rec. 15 IRT

EBU recommendation R 49-1999

EBU Tech. 3205-E 2nd edition, November 1979 - “The E.B.U. standard Peak-Programme Meter for the control of international transmission”  
Tech 3276 s1

EBU Technical Recommendation R68-2000 - Alignment level in digital audio production equipment and in digital audio recorders

EBU Technical Recommendation R72-1999 - Allocation of the audio modes in the digital audio interface (EBU document Tech. 3250)

EBU Technical Recommendation R91-2004 - Track allocations and recording levels for the exchange of multichannel audio signals

IEC 268-10

IEC 268-18

ITU-R BS.645-2

## LICENSE

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

[http://creativecommons.org/licenses/by-nc-nd/3.0/deed.en\\_US](http://creativecommons.org/licenses/by-nc-nd/3.0/deed.en_US)

