

dBs Made Simple

Table 1A—Translation of decibels into power ratios in steps of 10 dB.

Decibels	Power Ratio	Decibels	Power Ratio
10	10	70	10,000,000
20	100	80	100,000,000
30	1,000	90	1,000,000,000
40	10,000	100	10,000,000,000
50	100,000	110	100,000,000,000
60	1,000,000	120	1,000,000,000,000

Note: To translate dB into power ratios, for each 10 dB add a zero to the number a zero to the number 1.

Table 1B—Translation of decibels into power ratios in steps of 1 dB.

Decibels	Power Ratio	Decibels	Power Ratio
1	1.26	6	3.98
2	1.58	7	5.01
3	2.00	8	6.31
4	2.51	9	7.94
5	3.16	10	10.00

Note: Each ratio, except the first, is obtained by multiplying the preceding ratio the preceding ratio by 1.26 (more exactly, by 1.25893).

Table 2A—Translation of decibels into voltage ratios in steps of 20 dB.

Decibels	Voltage Ratio	Decibels	Voltage Ratio
20	10	120	1,000,000
40	100	140	10,000,000
60	1,000	160	100,000,000
80	10,000	180	1,000,000,000
100	100,000	200	10,000,000,000

Note: To translate dB into voltage ratios, for each 20 dB add a zero to the number a zero to the number 1.

Table 2B—Translation of decibels into voltage ratios in steps of 1 dB.

Decibels	Voltage Ratio	Decibels	Voltage Ratio
1	1.12	11	3.55
2	1.26	12	3.98
3	1.41	13	4.47
4	1.58	14	5.01
5	1.78	15	5.62
6	2.00	16	6.31
7	2.24	17	7.08
8	2.51	18	7.94
9	2.82	19	8.91
10	3.16	20	10.00

Note: Each ratio, except the first, is obtained by multiplying the preceding ratio the preceding ratio by 1.12 (more accurately, by 1.12202).

Apparent Loudness	dB SPL	
	-225	12' in front of Cannon
	-210	below muzzle
	-195	
Deafening	-180	Rocket Engines
	-165	Jet Engine, Close up
	-150	Permanent Damage to Hearing
	-135	
	-120	Threshold of Pain
Very Loud	-105	Power Tools Subway
	-90	Heavy Truck Traffic
Loud	-75	Busy Street
	-60	Average Conversation Average Office
Moderate	-45	Subdued Conversation
	-30	Quiet Office
Faint	-15	Quiet Living Room
Very Faint	0	Threshold of Hearing

dBm	+	+	+	+	+	+
	+24	+12	+20	+6	+6	+20
+40	X					
+30	X					
+20	X					
+10	X	X	X	X	X	X
0	X	X	X	X	X	X
-10	X	X	X	X	X	X
-20	X	X	X	X	X	X
-30	X	X	X	X	X	X
-40	X	X	X	X	X	X
-50	X	X	X	X	X	X
-60	X	X	X	X	X	X
-70	X		X			X
-80	X					

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Dynamic ranges of common sounds

Signal-to-noise ratios of various media