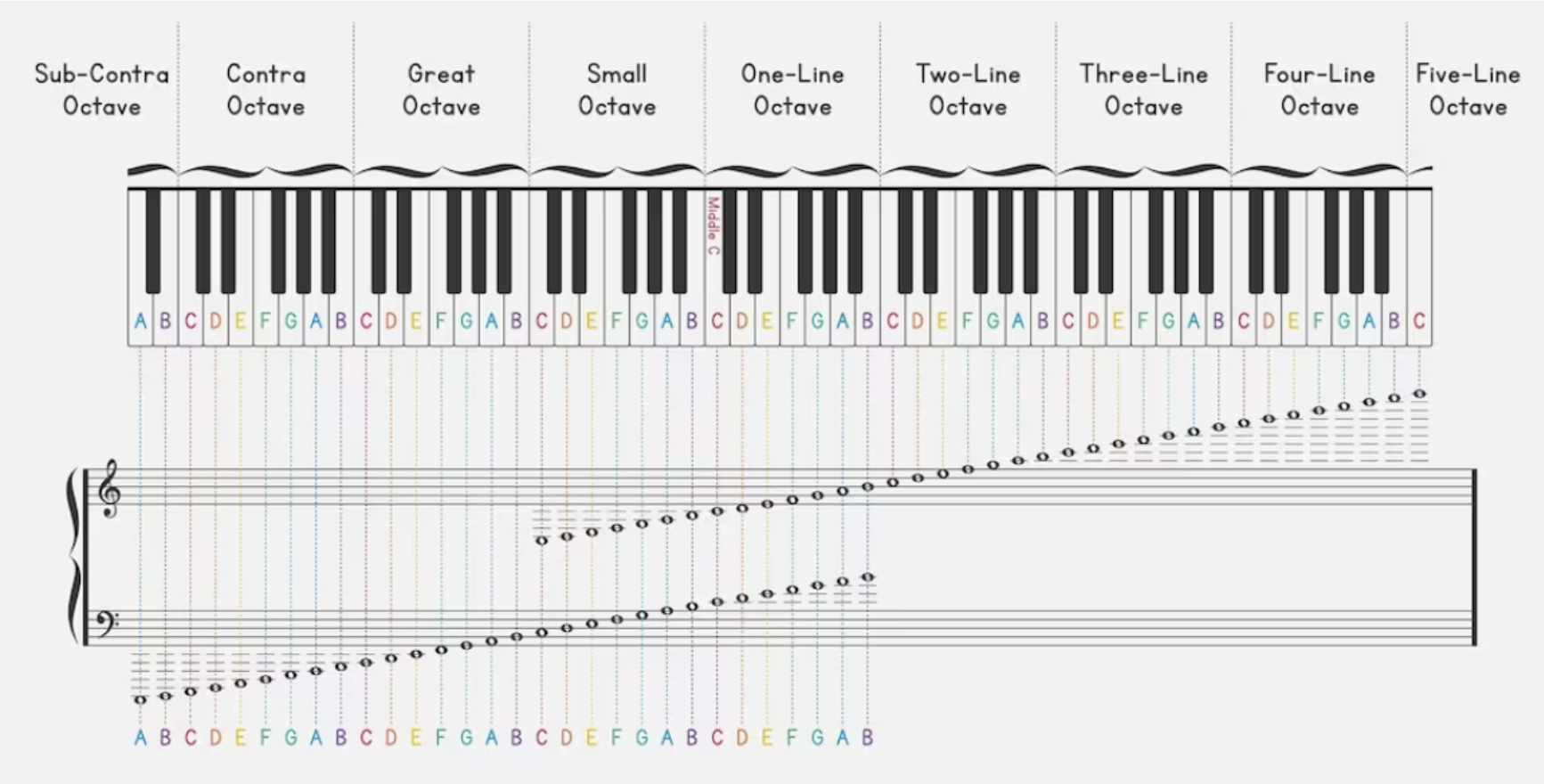


<i>LINES & SPACES</i>	<i>Half-step modulation</i>	<i>Bob Dobbs' Tiny Note Chart - Zeitgeist</i>
LINE "Every"	E1	Official State (Second World)
SPACE F	E#/F1	Hadron
	F#/Gb	Lockdown BobRule
LINE "Good"	G1	Mythic Government (Tetrad)
	G#/Ab	Monad (Patsy Cline's chronic Paranoia & Beatnik's Organization Man)
SPACE A	A1	Lofit (because of Graviton)
	A#/Bb	Orphic Baroque Spirals (because of Four Stages of Apprehension)
LINE "Boy"	B1	Bob (because of X Particle)
SPACE C	C2	Sex (under Lofti)
	C#/Db	Baryon
LINE "Does"	D2	Consciousness
	D#/Eb	Holeopathic TV Satellite (because of Gordie Howe)
SPACE E	E2	
LINE "Fine"	E#/F2	



Note	Frequency (Hz)	Wavelength (cm)
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E ₄	329.63	104.66
F ₄	349.23	98.79
F [#] ₄ /G ^b ₄	369.99	93.24
G ₄	392.00	88.01
G [#] ₄ /A ^b ₄	415.30	83.07
A ₄	440.00	78.41
A [#] ₄ /B ^b ₄	466.16	74.01
B ₄	493.88	69.85
C ₅	523.25	65.93
C [#] ₅ /D ^b ₅	554.37	62.23
D ₅	587.33	58.74
D [#] ₅ /E ^b ₅	622.25	55.44
E ₅	659.25	52.33
F ₅	698.46	49.39

E ₄	323.63	106.60
F ₄	342.88	100.62
F [#] ₄ /G ^b ₄	363.27	94.97
G ₄	384.87	89.64
G [#] ₄ /A ^b ₄	407.75	84.61
A ₄	432.00	79.86
A [#] ₄ /B ^b ₄	457.69	75.38
B ₄	484.90	71.15
C ₅	513.74	67.15
C [#] ₅ /D ^b ₅	544.29	63.39
D ₅	576.65	59.83
D [#] ₅ /E ^b ₅	610.94	56.47
E ₅	647.27	53.30
F ₅	685.76	50.31

Equations for the [Frequency Table](#)

The basic formula for the [frequencies of the notes](#) of the [equal tempered scale](#) is given by

$$f_n = f_0 * (a)^n$$

where

f_0 = the frequency of one fixed note which must be defined. A common choice is setting the A above middle C (A_4) at $f_0 = 440$ Hz.

n = the number of half steps away from the fixed note you are. If you are at a higher note, n is positive. If you are on a lower note, n is negative.

f_n = the frequency of the note n half steps away.

$a = (2)^{1/12}$ = the twelfth root of 2 = the number which when multiplied by itself 12 times equals 2 = 1.059463094359...

The wavelength of the sound for the notes is found from

$$W_n = c/f_n$$

where W is the wavelength and c is the speed of sound. The speed of sound depends on temperature, but is approximately 345 m/s at "room temperature."

Examples using $A_4 = 440$ Hz:

C_5 = the C an octave above middle C. This is 3 half steps above A_4 and so the frequency is

$$f_3 = 440 * (1.059463..)^3 = 523.3 \text{ Hz}$$

If your calculator does not have the ability to raise to powers, then use the fact that

$$(1.059463..)^3 = (1.059463..)*(1.059463..)*(1.059463..)$$

That is, you multiply it by itself 3 times.

Middle C is 9 half steps below A_4 and the frequency is:

$$f_{-9} = 440 * (1.059463..)^{-9} = 261.6 \text{ Hz}$$

If you don't have powers on your calculator, remember that the negative sign on the power means you divide instead of multiply. For this example, you divide by $(1.059463..)$ 9 times.

Relevant Links

Chart Note and their Frequencies <https://pages.mtu.edu/~suits/notefregs.html>

Ultimate Guide to Musical Frequencies <https://www.idrumtune.com/ultimate-guide-to-musical-frequencies/>

Interactive Chart https://alexix.nl/eq_chart/

Note the Pipe Organ http://www.bam.ie/bam_bright_arc_man/universe/dancing_laser_acoustic_spectrum.html