

Laryn Qi

Kulpa

MUSIC158A

Rhytch

Abstract:

What's the difference between a piano and a drum? Most would say that, on a piano, one can play different notes with unique pitches to generate chords that are layered on top of an underlying rhythm; drums, on the other hand, are solely based in rhythm and have nothing to do with pitch. For most, there is a clear and irreconcilable distinction between rhythm and pitch. Furthermore, in introductory music theory classes, pitch and rhythm are almost always taught separately before being combined. This project explores the connection between pitch and rhythm using Max and ultimately aims to unify the two. Specifically, it uses carefully picked polyrhythms and accelerates the tempo up to unreasonably high levels in order to create traditional chords. Although the main patch contains a demonstration of this transition from the rhythmic plane to the pitch plane and back, much of the potential of this approach to music-making remains uninvestigated; it's encouraged that users explore the possibilities for this tool for themselves!

Resources:

- [“Polyrhythms are Polypitch”](#) by Adam Neely
- *New Musical Resources* by Henry Cowell (see below)

NEW MUSICAL RESOURCES

as is shown below. Equivalent numbers are suggested here for such fractions as are produced by using 24 as a base. It will be noted that the scale as given begins from the octave of the fundamental—namely, 48.

Ratios from C	Tones of Chromatic Scale	Equivalent M. M. Nos.	Second Equivalents (to Avoid Fractions)
	C	= 48	
14 : 15	C#	= 51 3/7	(C# as 5th partial of A = 50—ratio from C, 24 : 25)
8 : 9	D	= 54	
5 : 6	Eb	= 57 2/5	(Eb as 3rd underpartial of Bb = 56—ratio from C, 6 : 7)
4 : 5	E	= 60	
3 : 4	F	= 64	
5 : 7	Gb	= 67 1/5	(F# as 11th partial of C = 66—ratio from C, 8 : 11)
2 : 3	G	= 72	
5 : 8	Ab	= 76 4/5	(G# as 5th partial of E = 75—ratio from C, 16 : 25)
3 : 5	A	= 80	
4 : 7	Bb	= 84	
8 : 15	B	= 90	
1 : 2	C	= 96	

The ratios from C of the second equivalent M. M. numbers are more complex than those of the first equivalents; but, owing to the base of the scale (24), produce whole numbers, whereas the ratios of the first equivalents produce fractions.

Below is given another tempo scale, on a base of 30.

RHYTHM

This base is acoustically more correct, but the scale formed from it contains more difficult fractions than that formed from the base 24. The scale as given begins on the octave C = 60.

Ratios from C	Tones of Chromatic Scale	Equivalent M. M. Numbers
	C	= 60
14 : 15	C#	= 64 2/7
8 : 9	D	= 67 1/2
5 : 6	Eb	= 72
4 : 5	E	= 75
3 : 4	F	= 80
5 : 7	Gb	= 84
2 : 3	G	= 90
5 : 8	Ab	= 96
3 : 5	A	= 100
4 : 7	Bb	= 105
8 : 15	B	= 112 1/2
1 : 2	C	= 120

Although at first sight the fractions in this scale do not seem more difficult to handle than in the scale based on 24, it will be seen that two of the fractions are used in the expression of the tones D and B of the major scale, whereas the fractions incurred in the scale based on 24 are in the less-used chromatic tones; and also that whereas equivalents can be found for the latter, for the former there are none possible, since there is but one correct method of obtaining ratios for the major scale. As has been stated before, however, the numbers and fractions contained in this scale can be accurately determined and marked on a metronome,