

EAR | WAVE | EVENT

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*The subaudio wholetone scale*  
*7 : 8 : 9 : 10 : 11 : 12 at 120 bpm*  
BY MARC SABAT

*an 11-limit modulation for tamburas in changing scordature for Catherine  
Christer Hennix and Marcus Pal*

This piece is part of an ongoing research branch of just intonation music, drawing on instruments and idiomatic characteristics of the Indian classical musical tradition. In particular, it references a line of work which has evolved out of the teaching of Pandit Pran Nath, manifested in numerous compositions by La Monte Young, Terry Riley, Catherine Christer Hennix, and various younger musicians.

In Berlin, I came to know the tamburas of Pandit Pran Nath in Catherine Christer Hennix's studio whilst assisting Marcus Pal in making recordings of her ongoing composition for these two instruments tuned pa-sa-sa-SA, and played at once. Astounded by the rich variety of spectral interactions of the instruments, which are normally heard in an accompanying role while producing the harmonic drone in Indian music, I was inspired to create a new piece for this wonderful instrumentation.

For a number of years, in conversations with my composer colleague and friend Jeremy Woodruff, we would discuss the possibility of composing harmonic "modulations" of the traditionally fixed drone in Indian music. Might it be possible, we wondered, to compose harmonic changes (structurally and formally significant movements between gamuts of tones) in a way which could also be relevant to the development of new Indian raga forms? Could this also be heard as an interesting new form of music from other listening perspectives?

I began to consider the most commonly used consonant tambura tunings (sa-ma, sa-pa, sa-ni). I found a way of harmonically relating two very distant patterns a quarter-tone apart by considering just intonation ratios from a common subaudio fundamental (2 Hz). The composition is a gradual transformation between these two drones.

I imagine a realization of this piece as a recording played over multiple loudspeakers distributed in a large space, or in a network of connected rooms. Each bar of the music, and each of the two tamburas in changing scordature, is recorded independently, cycling its repeating pattern for a long time. These are then edited into a sequence of gradually changing harmonies. Each pair of loudspeakers reproduces a slow loop through the score, offset from the next pair by one or more bars. In this manner, the entire piece — one “dissonant” harmony beating at 120 bpm — is always sounding all at once, but by walking past the loudspeakers, one may play/hear through the piece as a modulation between two consonant drone tunings, running the harmonic changes forwards or backwards in time.

Berlin, November 2014

*Marc Sabat*

**The subaudio whole-tone scale  
7:8:9:10:11:12 at 120 bpm**

*an 11-limit modulation  
for tamburas in changing scordature*

**PLAINSOUND MUSIC EDITION**

# The subaudio wholetone scale

7 : 8 : 9 : 10 : 11 : 12 at 120 bpm

*an 11-limit modulation for tamburas in changing scordature  
for Catherine Christer Hennix and Marcus Pal*

Moderato

Marc Sabat

plucking in the ordinary direction (pa-sa-sa-SA)  
Hz : 128

64 96 112

+ indicates a change in tuning

Difference  
Tones

Hz : 64

64 96 112

plucking in the reverse direction (SA-sa-sa-pa)  
Hz : 128

+ indicates a change in tuning

88 152 66 110

64 48 40 32 24 16

68 64 36 40 30 24 20 16

62 68 46 40 30 24 20 18 20

62 68 46 40 30 24 20 18 20

62 68 46 40 30 24 20 18 20

44 46 40 30 24 20 18 20

14 8 4 2

14 8 4 2

14 8 4 2

14 8 4 2

subaudio Hz : 8

66 62 66 66 66

44 36 40 22 30 44 22

22 30 18

14 8 4

14 8 4

66 132 88

plucking in the reverse direction (SA-sa-sa-pa)

I

66 44 44 66

22 22 22

DT

plucking in the ordinary direction (pa-sa-sa-SA)

II

I

66 66 62 66 68 62 44

44 40 46 40 46 40 44

22 36 22 18 30 22 22

DT

SA

14 8 4

14 8 4

14 8 4 2

II

I

68 48 68 64 68 64

46 46 40 36 40 36 40

30 30 24 20 24 20 24

20 18 16 20 16 16 16

14 8 4 2

14 8 4 2

14 8 4 2

16 16 16

64 48 40 36 24 16

DT

SA

II

return to beginning,  
play Tambura (II)

I

64 64

32 32

DT

return to beginning,  
play Tambura (I)

II

Berlin, April-October 2014

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Canadian composer **Marc Sabat** (\*1965) has been based in Berlin since 1999. He has made pieces for concert and installation settings, drawing inspiration from investigations of the sounding and perception of Just Intonation and of various music traditions — folk, experimental and classical. His pieces are presented and broadcast internationally at festivals of new music including the Donaueschinger Musiktage, MaerzMusik, Huddersfield, Darmstadt, Musica Viva and Carnegie Hall. Scores and artist editions are available from Plainsound Music Edition. Recent recordings include the LP “Les Duresses”, released by care of editions (Berlin) as well as discs on the labels Populist Records (Los Angeles) and World Edition (Köln). Sabat studied composition, violin and mathematics at the University of Toronto, at the Juilliard School in New York, and at McGill University, as well as working privately with Malcolm Goldstein, James Tenney and Walter Zimmermann. He teaches at the Universität der Künste Berlin, and has been a guest artist at the California Institute of the Arts, at the Escola Superior in Barcelona and the Paris Conservatoire. In 2010, he was an artist-in-residence of the Villa Aurora in Los Angeles, followed in 2011 by a one year residency at the German Academy in Rome, Villa Massimo. <http://www.marcsabat.com/>