

Rhythms of Drum Dance

Roberto Velázquez Cabrera

<http://www.tlapitzalli.com/>

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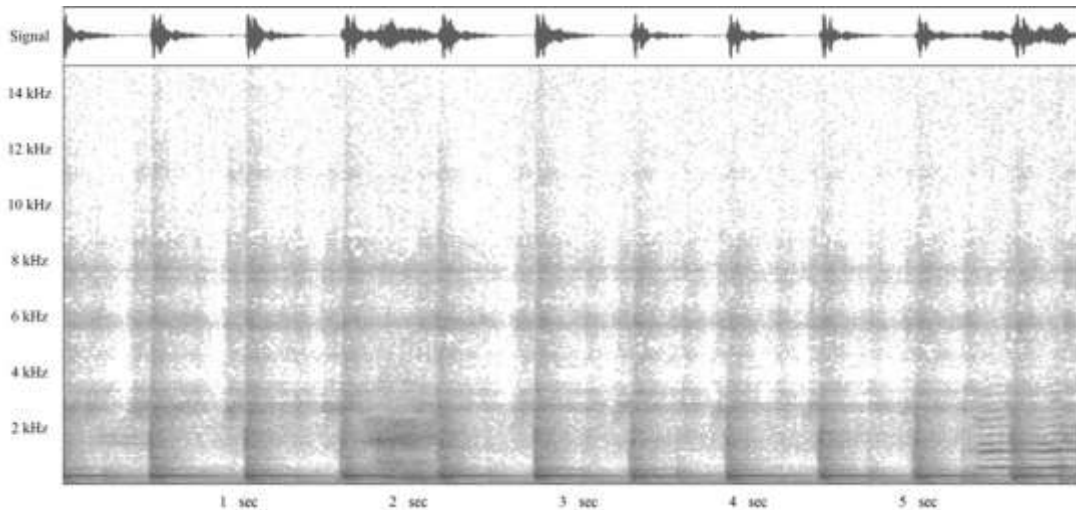


Fig. 1. Spectrogram of 6 seconds segment of Drum Dance

This exemplificative exercise is to characterize the constant monophonic rhythms of beats drum accompaniment included in the open audio track 112. Drum Dance from disc of Smithsonian Folkways [Cry from the Earth: Music of the North American Indians](#). The general information provided of the selected audio track is the following:

TRACK ARTIST Corbett Sundown
COUNTRY(S) United States
CULTURE GROUP(S) Iroquois; Seneca
GENRE(S) American Indian
INSTRUMENT(S) Drum
DURATION 0:36

Additional few data of the audio track 112 is provided in a [pdf](#) (p 5). It has two regular constant monophonic rhythms of the drum accompaniment:

The first spectral window segment of 6 seconds with nearly 11 beats are shown in Fig. 1. With these data, it is possible to calculate the rhythm generated in 60 seconds (11 segments of 6 sec), which is $11 \times 6 = 66$ beats/minute or nearly 1 beats/sec. It could induce in the two brain lobules an electrical signal through the middle of the lowest infrasound frequency range called Delta (1-4/sec). It also reinforces the heartbeat, because is almost equal to the minimum of normal male.

That rhythm was found in other monophonic recordings from the south of the continent at a very long distance (more than 8000 km), as it is shown in [Sonidos de una Fiesta de los Chinos de Chile](#).

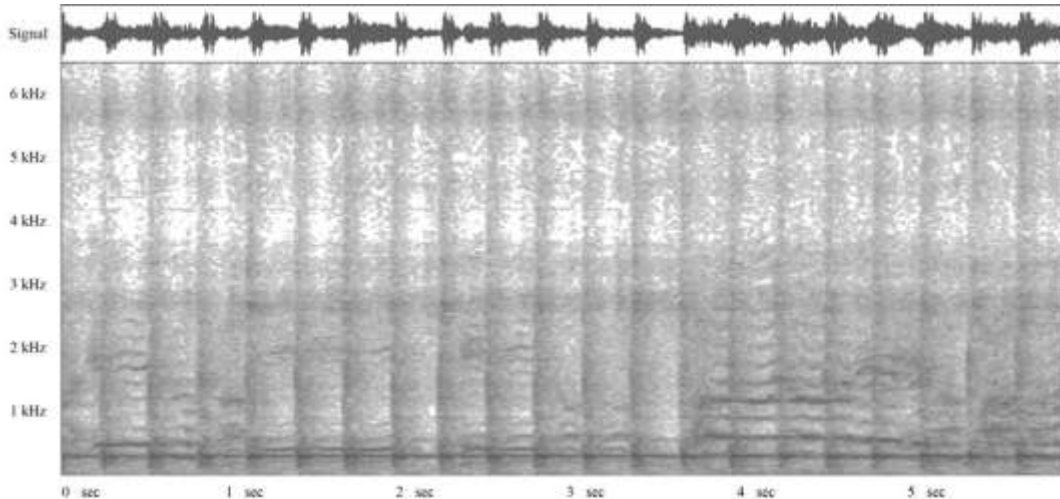


Fig. 2. Spectrogram of other 10 seconds segment of Drum Dance

In the second spectral window of 10 seconds from other segment of track 112 with nearly 20 beats of the drum accompaniment is shown in Fig. 1. The rhythm generated in 60 sec (6 windows of 20 beats) is $6 \times 20 = 120$ beats/minute or 2 beats/sec. It could induce in the two brain lobules an electrical signal through the middle of the lowest infrasound frequency range called Delta. It also reinforces the heartbeat, because is twice the minimum of normal male. It is believed that the total special effect was crossed: first, the frequency in the Delta-Theta range induced in the two brain lobules a state of rest and minimum energy consumption, and secondly, increased heart rate, inducing increased circulation of blood throughout the body. That was what originated not get tired soon and enter into an altered state and could be the cause of its ceremonial, medicinal or shamanic use. It can also be the cause of its use has been maintained for millennia in a very large continental zone. Some even use similar rhythms. It is believed that those rhythms is what most culturally united and more is what can unite them, if those that practice them are aware of it.

It is very interesting to find that 2 beats/sec is the spontaneous, normal or natural *tempo* found in several studies, equal to [500 msec](#). It is also equal to the primitive *tempo* of a disappeared primitive song [Ritmo de un canto selk'nam](#), from Tierra del Fuego, located at the extreme south of the continent.

There is an interesting publication on [The Ojibwa Dance Drum](#), but the rhythm of its beats was not characterized and shown. The basic drum rhythms are very

similar: regular and constant beats; regular but two beats slightly closer together, and; two regular beats as the heartbeat with a beat stronger.

The maximum rhythm of a dance was found in [Análisis spectral de los sonidos de la danza azteca chichimeca](#), equal to 240 beats/minute or 4 beats/sec. It is located in the upper limit of the infrasonic range Delta. It also may reinforce the heartbeat, because is equal to 60 multiplied by 4. It is the maximum rhythm that can be followed by the steps of a war dancer and the beats of a big drum as the huehuetl. In the Abstract of a thesis a comment of Theta frequency is provided¹:

“A pattern that incorporates approximately 4 to 4 1/2 beats per second is the most inducing for Theta gain. (Theta frequency is usually associated with drowsy, nearunconscious states, such as the threshold period just before waking or sleeping. This frequency has also been connected to states of "reverie" and hypnogogic or dream-like images.)”

Other analyzed rhythms are located near the middle of a multiple of the normal heartbeat, as in the [Ritmos yumanos](#) of 3.5 rattle beats/sec or 210 beats/minute. 210 are equal to 70x3. It is interesting the comment on the effect of this *tempo* included in a paper²:

“...the sounds of a rattle or (frame drum) of approximately 210 bpm (beats per minute) produce a spontaneous burst of energy in the body; this burst of energy allows to induce in the subject a controllable hallucinatory experience on all levels of perception (vision, auditory sense etc.)”

The exercise proves and shows the importance of the numeric characterization of beats rhythm and *tempo* from the first recordings to compare and find relations between the sonorous uses and tastes of their ancient cultures.

It is possible to design or to find a computer program for the automatic extraction of the regular *tempo* or beats per minute (BPM) of digital audio tracks, but it is not useful if the hundreds of thousands of ethnological recordings are not openly available for their analysis.

The main limitation to investigate, characterize and compare more widely the recorded rhythm or *tempo* of dances of the original cultures of the continent, is that scholars were not interested in their formal study, since they has been more interested in their songs and melodies.

¹ Melinda C. Maxfield, Abstract effects of rhythmic drumming on EGG and subjective experience. [Abstract](#) of Ph. D. thesis.

² Jörg Fachner Sabine Rittner. 2004. [Sound and trance in a ritualistic setting visualised with EEG Brainmapping](#). Music Therapy Today Vol. V (2) p3 & 4