– and, as I was saying, ...

Ezra Sims (1979)
...critical bandwidth varies with frequency. It is a large percentage of the frequency of two tones that are at low frequencies, and a small percentage for two tones of high frequencies. Figure 2.6 shows the change of width of the critical band with frequency. Above about 440 Hz, the width of the band is constant at around one-fourth of an octave, i.e., around the musical minor third (around 19%). The fact that the critical band is larger at low frequencies helps to explain the common usage of larger musical intervals in the bass register in most music. The width of the critical band plays a role in the perception of loudness and timbre, as well.

### Tuning Systems

Computer-music synthesis systems offer the musician complete freedom of with respect to tuning. This situation differs greatly from the fixed intonation of acoustic and some electronic instruments. In the following section, we will the properties of four common systems for tuning: equal temperament, diatonic, mean-tone tuning, and Pythagorean tuning.

Equal temperament with twelve semitonal divisions of the octave is by far the common system of musical intonation used today in Western music for and instruments. In the general case of equal temperament, an interval $I$ is divided into a number of intervals $N$ all of equal size (that is, all having equal...
Movement for Jon Harrison
for just bass quartet
(Staff score)

# This high note, a double step, is optional
The tonal system is its conception of tonalities, and its consonation is not capable of the other common intricate musical tonality identity. The unheard modulation and the arbitrary identities transform Identities into musical identity in that except possible tonalities, therefore a greater uses Equal Temperament and from that—short of a psychic and a practical. The same musical yet practical.

Diagram 9.—The Expanded Tonality Diamond
Movement for Lou Harrison
Larry Polansky
Otonalities (ascending) are found in the six lines of blocks from lower left to upper right, Utonalities (descending) in the six lines of blocks from upper left to lower right (see photograph and Diagram 17). It may be seen and heard immediately that each tone represents at least a dual identity; 5/3, for example, may be considered either the 5 Odentity of the 4/3 Otonality or the 3 Udentity of the 5/4 Utonality.

The total range is nearly three 2/1's, the identities of one tonality being spread over about a 2/1 and a half. The relationship of identities is always 4:5:6:7:9:11 in Otonalities, and 1/4:1/5:1/6:1/7:1/9:1/11 in Utonalities; consequently, the sequence of Odentities or Udentities is 1–5–3–7–9–11, rather than the 1–9–5–11–3–7 of the Tonality Diamond. In specific range, the low 16/11 makes about 285 cycles (just above "middle C"), the middle 1/1 makes 784 cycles, and the high 11/8 makes 2156 cycles.

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1 I built the Diamond Marimba in 1946 in Warren E. Gibson's shop in Madison, Wisconsin, with Gibson's advice and assistance. The height from the floor at the lowest block is 34 inches, at the highest 41 1/2 inches. The center row of 1/1's is 48 1/2 inches long, the terraced top is 27 inches deep from the front edge of the 16/11 block to the back edge of the 11/8 block. Each of the ten steps rises 3/4 inch. The whitepine crosspieces of the base are 33 x 20 1/4 inches; width—5 inches. Four 3/4-inch bronze posts support the instrument on the base.
Precision Piece: A Phrase For Arian's Leap

Poco Agitato

Syrinx 1
Ya Cheng

Metal Strings

Transfer Harp

Troubadour Harp

block

Percussion

struck with metal spike

Transer Harp

Perc.

sweeping angles

deep Tam Tam

To Charles Sheere from

Jou Harrison

15 Dec., 2519
A BRIEF STUDY OF INTERVALS

It becomes clear that there are two ways of composing with them: 1) arranging them into a fixed mode, or gamut, and then composing within that structure. This is known as Strict Style, and it is the vastly predominant world method.

However, another way is possible — 2) to freely assemble or compose with whatever intervals one feels that he needs as he goes along. This is Free Style, and I used this method first in my Symphony in Free Style. Lovely new devices & expressions are possible in this style — for example: sequences in which not only the level of sequence can be richly varied & controlled, but also the exact intervals interior to the figure. From my Symphony in Free Style, a rising & "expanding" sequence:

\[ \begin{align*}
11/12 & \rightarrow 11/13 & \rightarrow 10/9 \\
12/13 & \rightarrow 11/12 & \rightarrow 10/9 \\
10/11 & \rightarrow 9/10 & \rightarrow 8/9
\end{align*} \]

LATIN, "SU"

In modern mathematics, the ratio in which the terms \(3, \frac{16}{5}, \frac{10}{3}, \frac{5}{3} \) are found is known as a surd. Our word "auroch" comes from the Latin, "aurigochus," meaning "from deafness!"

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