CirSeq Inception

http://sdfphd.net/cirseq

Autumn 2008; as a counterpart to the spiroid frequency-space, a circular representation for a pattern looping time-space was sought.

Pattern looping -> think step sequencer.

Time-space -> think clock-face. On a standard clock face there are two angular markers; one, the 'minute hand', moves around the circle once per hour, while the other, the 'hour hand', travels in a 12-hour cycle.

In the formalisation of the Spiroid, the idea of seeing the pitch frequency continuum as a spiral was taken through to find mathematical formulae that describe the geometry of that space, and it was with a polar-coordinate system that the Spiroid frequency-space set.

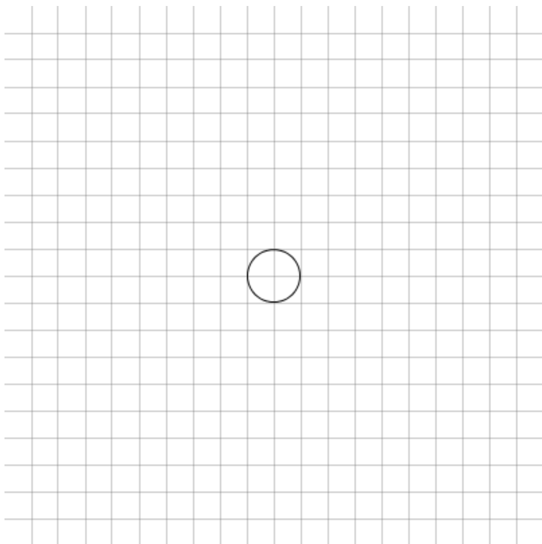
Embarking upon a quest to define a circular time-space representation the decision was made to start on a Cartesian plane.

An intriguing, but beautifully simple, discovery was made through the geom'ness of circles manifest on a Cartesian grid, in relation to divisive rhythms of common music notation (CMN).

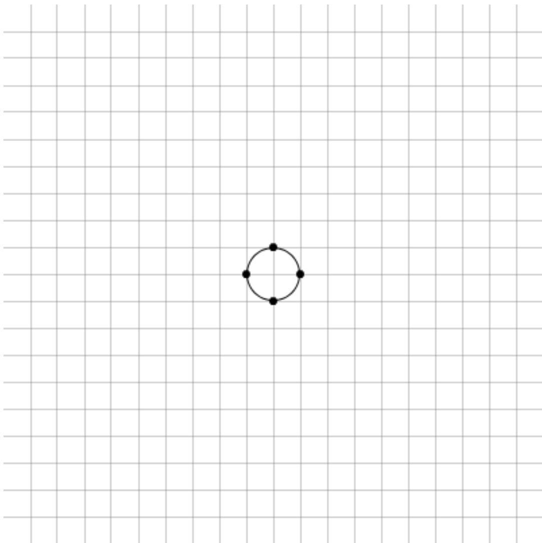
CirSeq Geometer Consciousness Sequence

If we begin with a Cartesian grid of unit divisions (the grid is infinite but bounded because we can imagine it continuing outward forever, but the bit of it we can see is limited by size of the image file):

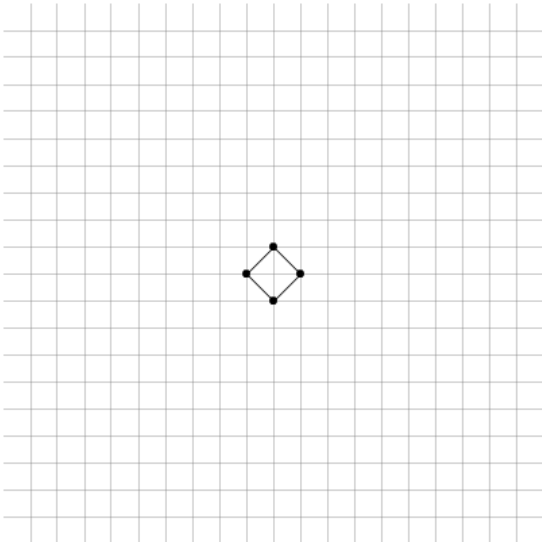
and then draw a circle of radius = one unit, on the grid:



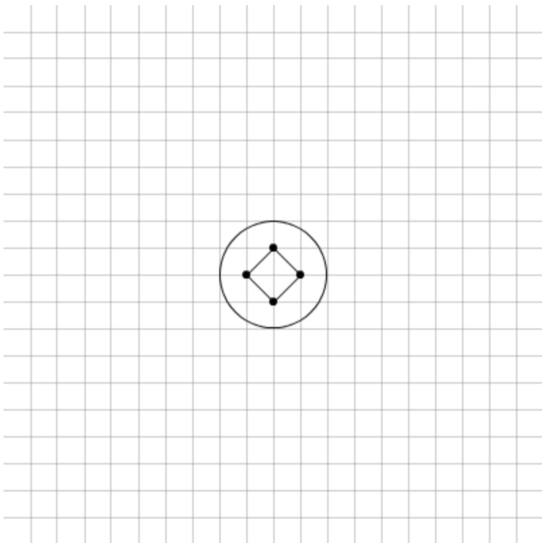
Notice that the circumference of the unit-radius-circle, by definition, touches the Cartesian unit-divided-grid at four vertices:



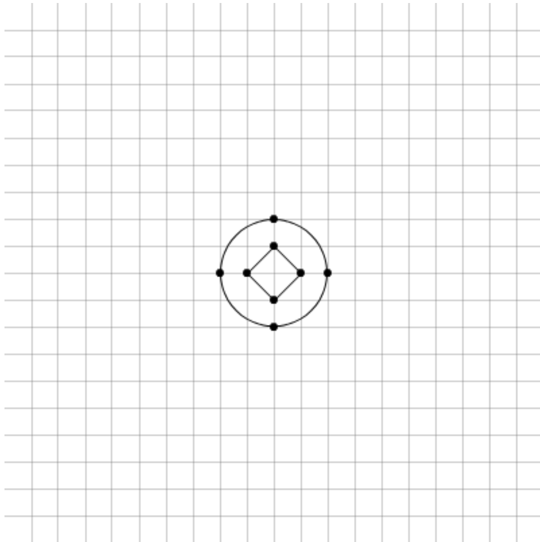
If the circle is to represent one measure of time, traversed in the way of a clock-face, then at it's most fundamental level the measure of time is divided into four equal steps. The linear distance of each step = sqrt(2) :



What happens when the radius of the circle is doubled? Here added is a concentric circle of radius = two units:

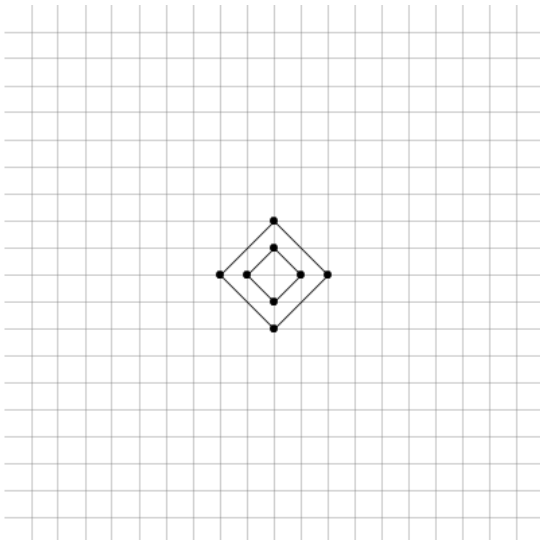


Again the circumference of the circle touches the grid intersections at four angles, corresponding to twelve, three, six and nine of the clock-face, or North, East, South and West of a compass-face:

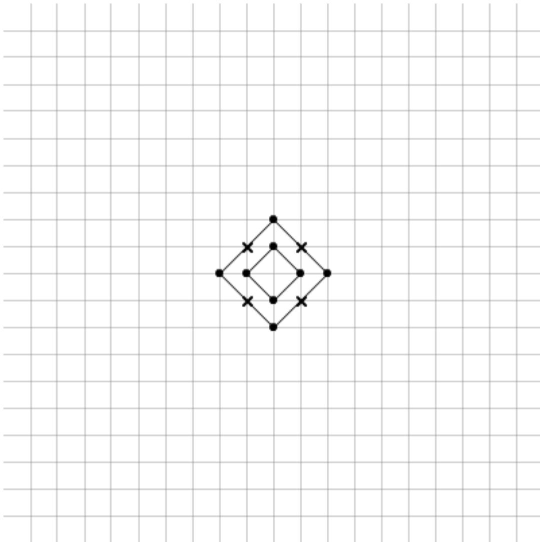


The angular positions of these four vertices, or, to put it another way, their phases within the cycle, are identical to those of the four steps on the one-unit-radius-circle.

The four steps on the two-unit-radius-circle are next, as was done before, connected linearly:

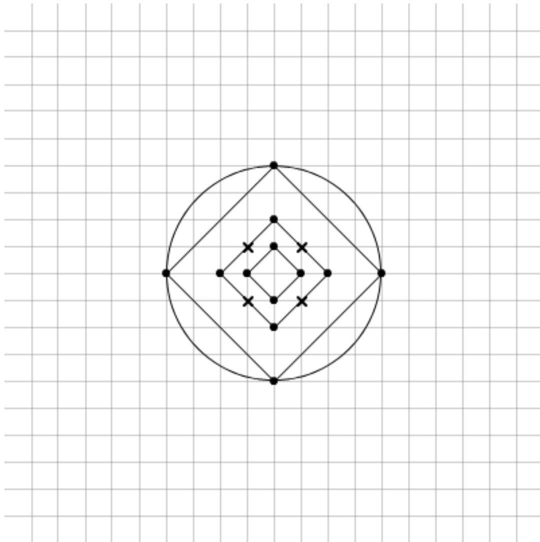


When drawn this is way there is another intersection with the Cartesian unit-grid at the mid point of each step. These newly found vertices are marked with a differently shaped 'dot':

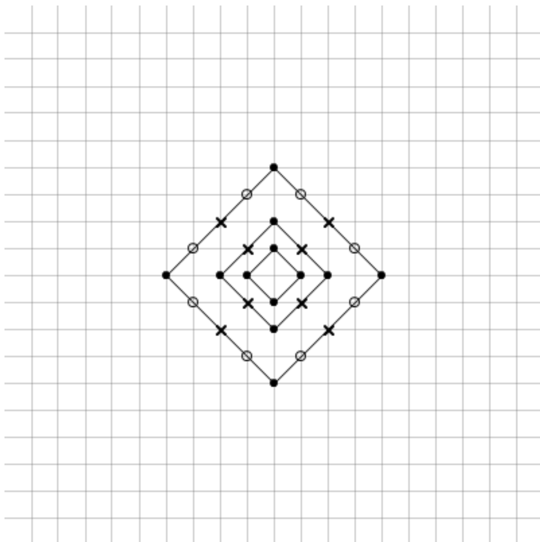


And so it is that this second track, which is based on a circle with a radius double the radius of the first, has double the number of steps. Every step is graphically manifest as a linear distance of sqrt(2) units, but the amount of time represented by each step is dependant on the base radius of the track. In track one, there are four steps so each step equates to a quarter of the measure of time represented by the circle. In track two each step represents an eighth of the cycle.

For the next track, the radius is again doubled, so this is track four:

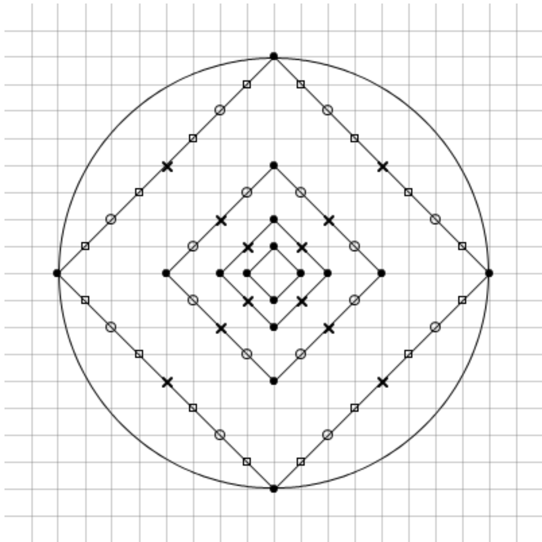


As might be expected, there are now twice as many steps as defined by intersection of the linear path formed by the unit-grid vertices of the circle and the unit-grid (That could be written more clearly, but the logic does work):



The passage of time in the time-space representation being developed here is angular about the common centre of the tracks. Thus all North aligned dots, for example, occur at the same moment.

In track four there are 16 steps. In track eight (circle radius = 8 units) there are 32 steps:



To be continued… for example in track three the manifestation is that of triplet-eighth notes in CMN terms…

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