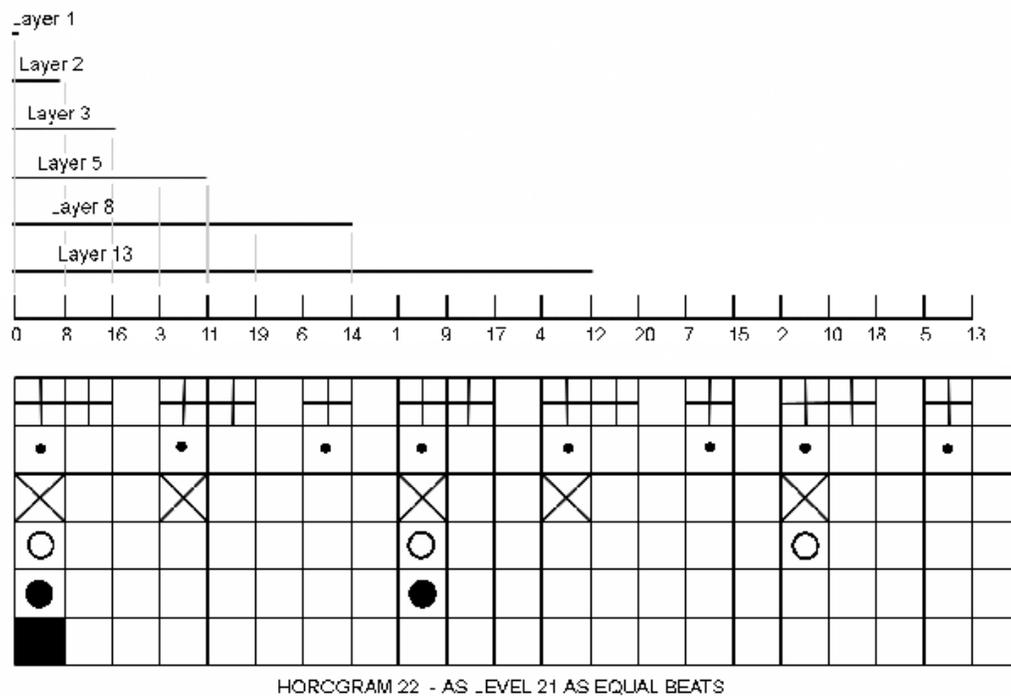


More on Horogram Rhythms

See <<http://anaphoria.com/hrgm.PDF>>

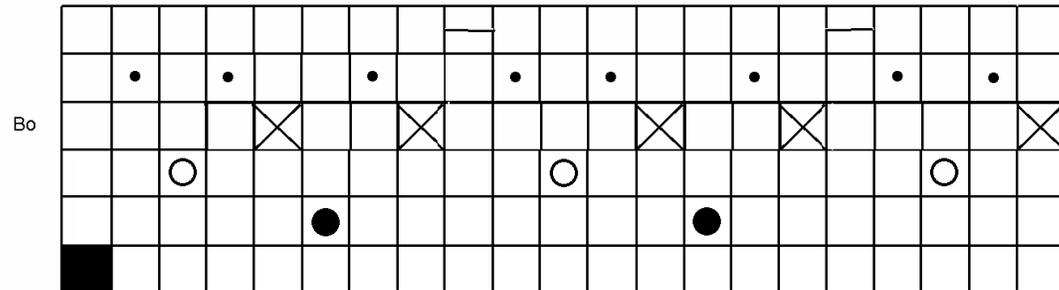
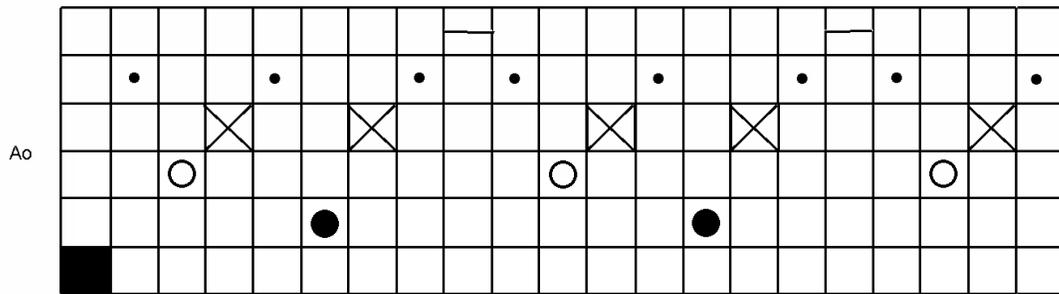
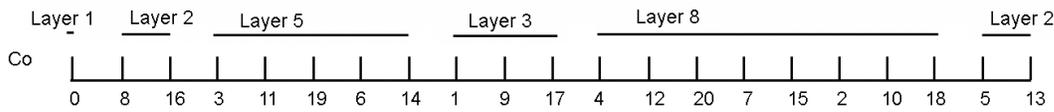
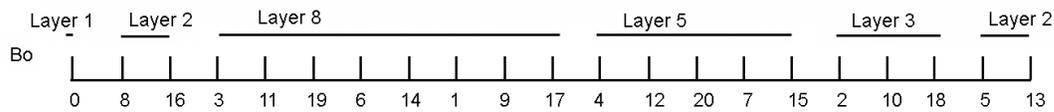
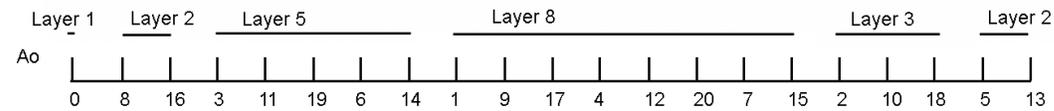
There is more to say and possibly to clarify what was put forth in the first paper <<http://anaphoria.com/hora.PDF>>.

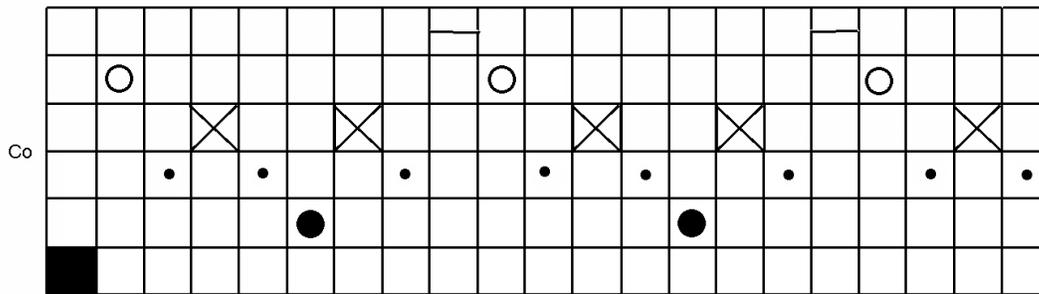
Since each Horogram is formed from a single generator, each layer can be visualized as a chain. Let us use the first diagram up to layer 21 from the preceding article and show the basic layers.



Working directly with the chains above, the Greatest Isomeric Symmetries (GIS), a term invented as a piece of humor, are perhaps easier to comprehend where each layer has no shared members with other layers.

In the chart below, the chain formed by an 8-unit generator illustrates how the layers in the previous article look from this new perspective. This view also shows how paired layers fit together to generate by their summations the equivalent of other layers. For example, the diagram below illustrates how layer 5 and 8 together make the same pattern as 13 or how layer 1, 2 plus 5 equal layer 8. A pattern labeled Co below, overlooked in the first article, was discovered once it was viewed as a chain.



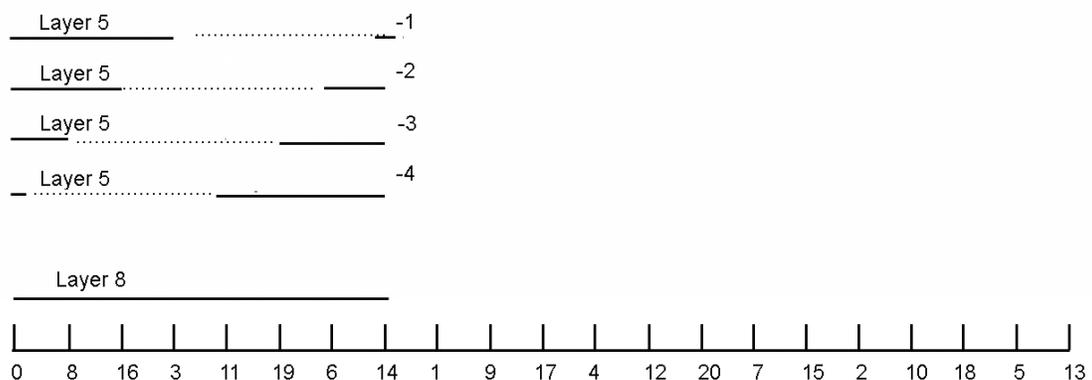


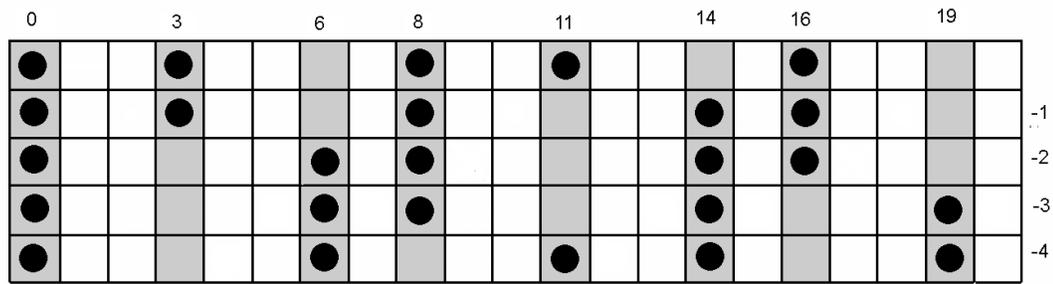
With the perspective of a chain we can also investigate the secondary or sub-moments patterns, which give us even further variations for rhythms. These secondary patterns are ‘symmetries of the symmetries’. It is best to refer to Wilson’s original description in his Moments of Symmetry paper <<http://anaphoria.com/mos.PDF>>. Here is a list of possibilities in the pattern discussed above.

8 out of 13 written:

- 8)13
- 5)8
- 3)5
- 2)3
- 1)2

Lets us look at how 5)8 looks using this chain followed by an illustration. Here a further notation, a minus (-), is used to designate stepping backward a generator unit confined within a layer. -5 thru -8 are just transposition of 0.

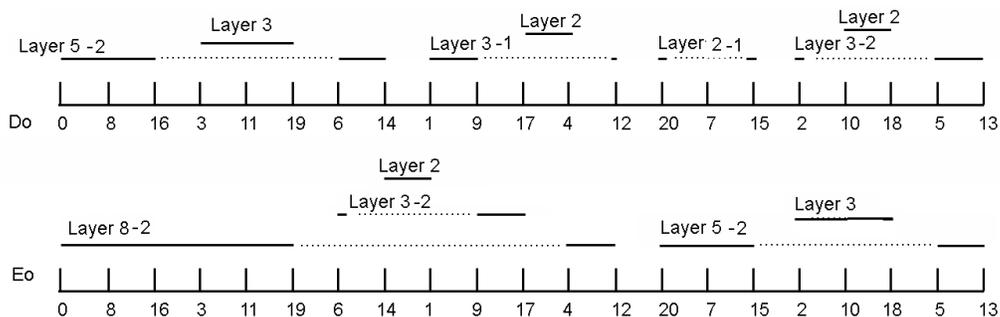


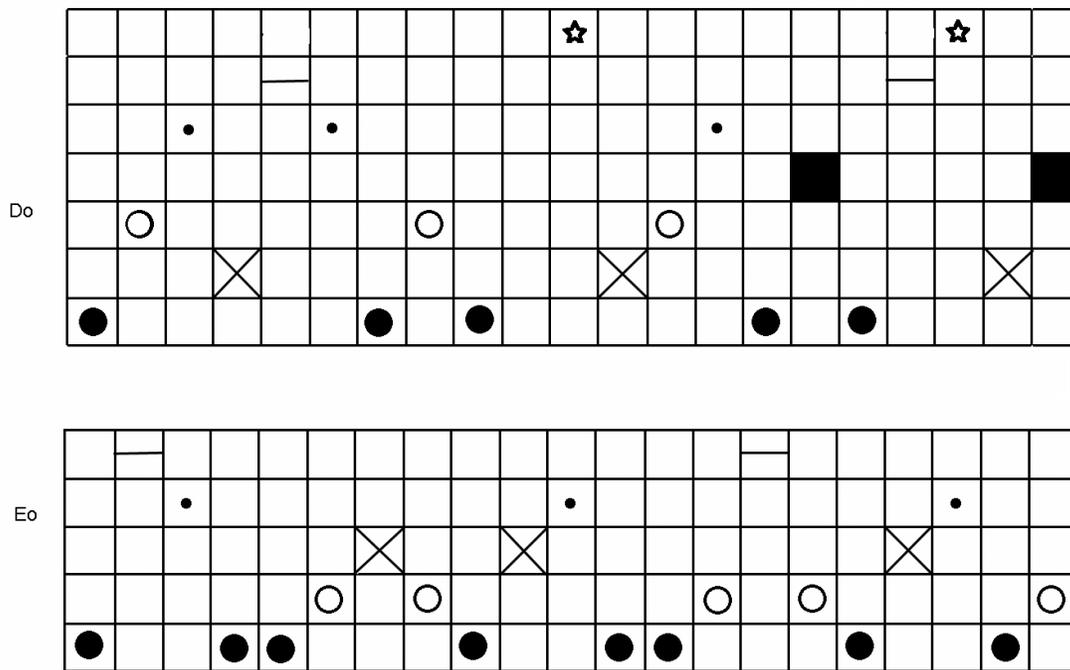


In investigating these secondary patterns, a few properties have come to my attention that I thought I would share. First the number of secondary formations is always equal to the number of units that make up the layer, e.g. 5)8 = 5 different secondary patterns. Of all the possible formations, one occurs more frequently than others, and this is the formation that already occurs as a basic layer. If we represent the subsets as y)z, the number of times this formation occurs can be predicted by z-y +1, e.g. for 5)8, 8-5+1=4.

Formations that are different from basic layers are those that include the disjunction. These can occur only once, but generally they can be paired with a retrograde version of itself. In the middle of these mirrored pairs are formations with the greatest difference between the biggest and smallest durations. The total number of different sizes though will never exceed 4.

Next we have 2 illustrations, Do and Eo as examples of how secondary can apply. Even though a pattern such as 8)13 takes up more horizontal space, it is possible to insert other patterns in the middle of this pattern, e.g. either 5)5 or 3)5 sequences. It may not be desirable to fill every beat, but it is a potential variation.





This type of layering was the method I used in my *Gendhing Canright* <<http://anaphoria.com/music.html>> applied to a meter of 108 with 29 being the generator. With a larger number, one has more possibilities to work with. I put this forward to give an idea of my compositional process as well as hinting at what others can do. It is possible with the use of computers to not round off a layer to equal steps and one could use pure proportions. Likewise these patterns can break up scale material into different groupings for timbre, panning or whatever way one wishes to apply.

The application of Horograms to rhythmic structures as outlined in this paper is a far journey from its original application to scales, but the methods suggested may offer new insights into organizing pitch.

[revised 19-5-2011]
 [revised 3-11-2012]