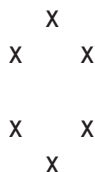# diamond rotations
for Tacet(i) Ensemble
John Eagle, 2020

For six mobile instrumental (preferably sustaining instruments) performers with a treble range (wide ranges are fine so long as the treble range is represented) and computers:

Six stations are arranged in a diamond shape with at least several feet (equally spaced) between each station:

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              x
          x       x

          x       x
              x
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At each station a laptop with speakers (internal or external) is set atop a small table or stand, positioned at a height for a standing performer to read from. The laptops must be on the same wifi network, with the free program SuperCollider installed (https://supercollider.github.io/) running the client script provided. One of the computers (or an additional computer) must be running the server script provided.

To begin, each player selects a starting station (any one is fine). The server computer triggers the beggining and each successive rotation/iteration. If this computer is one of the six, then whomever is at that station at the end of each iteration is responsible for triggering the next rotation. If it is an additional computer, then a seventh person is required to operate it and trigger each rotation.

A tone will be played at each station and each computer will display notation with four notes: a "root 1", "root 2", a "summation tone", and "difference tone". The summation and difference tones are derived from the two roots. The sounding tone is "root 1" and "root 2" is one of the sounding tones at another station. The player selects either the summation tone or difference tone (or whichever one is in range if only one is possible on the player's instrument) and plays it, sustaining with a pure tone, against "root 1". Using the printed cents deviations and harmonic ratio as aids, the player adjusts the intonation, constantly trying to refine it. The player may search for the pitch, moving up or down—testing different possibilities. The player may softly sing/hum to themself if this is helpful (to represent an octave of the fundamental if not present in the ratio, for instance). Once the desired intonation is acheived, the player goes off in search of "root 2" present at another station. When approaching another station, appoach from the side or back as to not view the screen and see the notation (the idea is to find the desired root aurally). Leave space for other players. When the correct root has been found, move to the front of the station to visually confirm the pitch. Then continue sustaining the selected pitch to acheive the new harmonic ratio, gradually refining the intonation as before. Once all the players have found their second station and tuned for a time, a new set of pitches are generated, starting the process over again with the current station becoming the player's new starting point. Each of these iterations is a rotation as at least one of the pitches will be in common.

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The notation below is an example of what each player will see displayed on a computer at each station. The exact pitches will vary between each section and with every performance. Pitches will always be in C—transposing instruments must transpose for themselves.

At player's station a tone will be playing electronically (the note "root 1"). Two additional notes are displayed ("summation tone" and "difference tone"). The player selects one of these notes to play—sustained and constantly adjusting to refine the intonation in relation to the electronic tone (if one of the notes is outside the range of the player's instrument, then the player must select the other one). After taking enough time to tune the selected pitch to the player's satisfaction, they search out the location of the tone in the second column (the note "root 2") which is sounding at another station. When approaching a new station, approach from the side or back as to not view the screen and see the notation (the idea is to find the desired root aurally). Leave space for other players. When the correct root has been found, move to the front of the statioin to visually confirm the pitch. Continue playing the same pitch as before, adjusting the intonation if necessary to achieve the indicated harmonic ratio. Once all the players have found their second station and tuned for a time, a new set of pitches are generated, starting the process over again with the current station becoming the player's new starting point.

Cents deviations are printed above each note. The harmonic ratio of the root to the summation tone and difference tone is printed in between the notes.