for jim, ben and lou
Three pieces for harp, guitar and percussion

I. Preamble
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for Jim Tenney

For guitar, diatonic harp, "tuner/2nd harp" (three performers), with optional three bass notes on second (concert) harp (played by tuner)

Tempo is relatively fast for the eighth note, (about 360). Except where indicated, the general dynamic level is mezzo forte, or a little louder depending on performance circumstances.

Any harp and any guitar might be used. The harp is diatonic, but a concert harp could be used without pedals. The guitar may be amplified, acoustic, or amplified acoustic, steel or nylon strings. What is important is a general matching of dynamics and timbre between the harp and guitar, though they do not need to be indistinguishable (just compatible).

The third performer's (tuner/2nd harp) main responsibility is to retune the guitar throughout the piece. This performer also plays harp, but only three low notes (C, E, and G) tuned to 1:1, 5:4, and 3:2. These are as low as possible: if a folk harp is used for the main harp part, the tuner might use the lowest notes on a concert harp for these three notes. These notes are always optional where written, and occur at the beginnings of measures as a kind of pedal/accident. If the performer is too busy retuning the guitar at any time, these notes can be omitted.

Harp Tuning
The (diatonic) harp is tuned differently in each of its four and a half octaves. The tuning is specified as harmonics of a given harmonic series, and the three series are related as 1:5:3 (a just major triad).

For example, C₃ is the 3rd harmonic of C, a G-natural 2⁴ sharp of equal-tempered G. E₁₁ is the 11th harmonic on E, which is 11/8 x 5/4 = 55/32, notated as a Bb 62⁴ flat of its tempered namesake (and actually, closer to an "A").

All pitches are referred to by their octave reduced ratios. The three harmonic series, their "note names" (used here) and their cents deviations from 12-ET are given below (only odd harmonics are given):

<table>
<thead>
<tr>
<th>C (1/1)</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>9</th>
<th>11</th>
<th>13</th>
<th>15</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>G</td>
<td>E</td>
<td>Bb</td>
<td>D</td>
<td>F#</td>
<td>Ab</td>
<td>B</td>
<td>C#</td>
<td>Db</td>
</tr>
<tr>
<td>0</td>
<td>+2</td>
<td>-14</td>
<td>-31</td>
<td>+4</td>
<td>-49</td>
<td>+41</td>
<td>-12</td>
<td>+5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E (5/4 to C)</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>9</th>
<th>11</th>
<th>13</th>
<th>15</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>B</td>
<td>G#</td>
<td>D</td>
<td>F#</td>
<td>Bb</td>
<td>C</td>
<td>D#</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td>-12</td>
<td>-28</td>
<td>-45</td>
<td>-10</td>
<td>-63</td>
<td>+27</td>
<td>-26</td>
<td>-9</td>
<td></td>
</tr>
</tbody>
</table>
The difference of \( \frac{5}{3} \) is higher than \( \frac{3}{2} \).

**Recommendation:** If the difference is more than \( \frac{5}{3} \), then the C is higher.

When the C is higher, the C is noted as in Db (-4), C# as in E (-\( \frac{1}{2} \)), the C is higher than the C.

- \( (+) \) (Db) 1 3 9 11 12
- \( (+) \) 9 11 12
- \( (+) \) (C#) 1 3 9 11 12
- \( (+) \) (C) 1 3 9 11 12
- \( (+) \) 9 11 12

When the E is higher than the C, the C is noted as in Gb (-4), G# as in Ab (-\( \frac{1}{2} \)), the C is higher than the G#.

- \( (+) \) (Gb) 1 3 9 11 12
- \( (+) \) 9 11 12
- \( (+) \) (G#) 1 3 9 11 12
- \( (+) \) (C) 1 3 9 11 12
- \( (+) \) 9 11 12

The piece is a continuous modulation through the three harmonics derived by the major (and sharp) c#'s.

The G# (and sharp) c#'s are shown below.

The piece is blend (and defined) through the piece (to these pieces as well).
and the tuner will be tuning (slightly) several strings at once. It may not really be possible to 
completely tune the guitar until the complete harmonic series has been achieved. The several 
measure passages before sections III and V may be repeated until the guitar is tuned to the 
ew harmonic series.

It is important that this performer know by ear the four different tunings of the guitar used, 
and the differences between them (of which the above is a theoretical, not a sonic, 
explanation). The current tuning is notated frequently throughout the piece, with numbers 
referring to the harmonic number of the new or entering series. No tuning is done in 
Section I.
*Gt 1st X only, then tune to C#*

**Guit.**

(tune I (E) → F (E♭3))

(tune III (G) → G♯ (E♯3))

**Tuner**

1st X only

**Harp**

(tune II → C♯ (E♭3))

(tune V → B♭ (E♭3))

*(In section II-IV, low notes on 2nd harp are optional; tuning is more important.)*
III

(G_{19}, E_{9})

(tune V → A\# (G_{13}))

(tune II → B (G_{7}))

Guitar

Tuner

Harp

(G_{19}, E_{9})

(G_{19}, E_{9})

(tune VI → E\# (G_{13}))

(G_{19}, E_{9})

Harp

Guitar

Tuner

Harp

(G_{19}, E_{9})

(G_{19}, E_{9})

(tune VI → D (G_{7}))

(G_{19}, E_{9})

Harp
Note: These three measures, until V, may be repeated to taste.

*In Section V, "leaving" pitches are accented slightly.