

**Two Pieces  
for  
Solo Microtonal Glass Organ**

By Glen Peterson  
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## 23 Note Per Octave Just Intonation Glass Organ

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Photo: the 2 octaves of the glass organ

The glass organ these pieces were written for is a set of wine glasses, brandy snifters, and trifle bowls tuned to various pitches and arranged on a stand so that they can be played without tipping over. Sometimes this instrument is called the Singing Glasses. Generally the rims of the glasses are rubbed with a wet finger producing a clear singing tone. The Glass Harmonicon is a different but similar instrument.

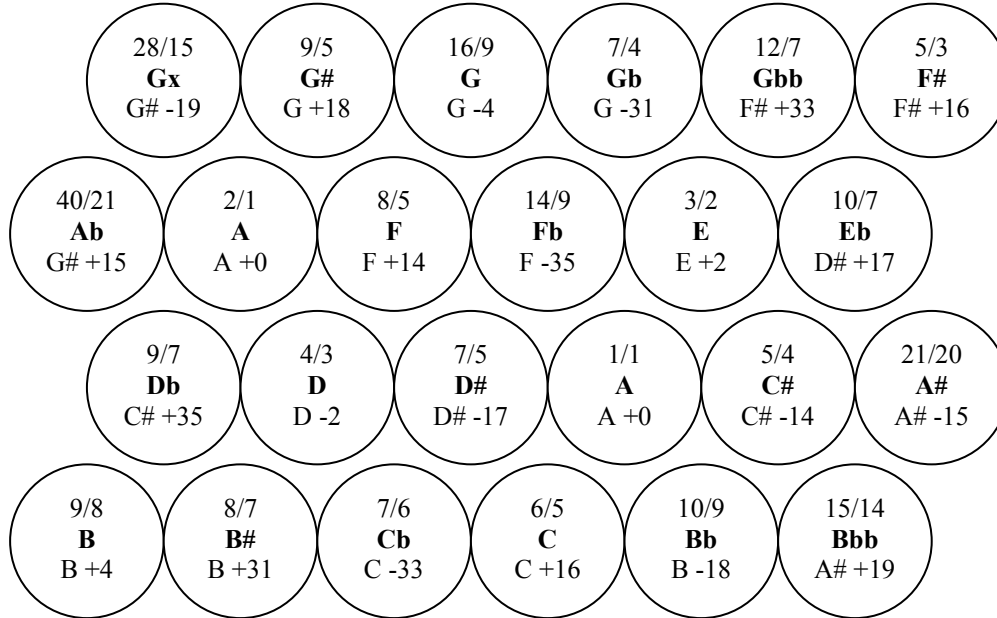
This instrument began as a simple way to experiment with microtonal tuning systems, but I have since settled on a 23-note per octave Just Intonation system. Notes in Just Intonation scale theory are often named by their ratios (fractions): the Hertz (vibrations per second) of the sounding note in relationship to a chosen fundamental. So, E = 660Hz, in the key of A (440Hz) would be  $660/440$  which reduces to  $3/2$ . Partch chose G as his fundamental, I chose A = 440Hz because so much of the world tunes to that note already.

Harry Partch's book, Genesis of a Music and his concepts of Otonality and Utonality had a profound influence on my creation of this instrument. An Otonality is a set of notes played together where the denominators (the bottom of the fraction) share a common prime or odd factor, while the numerators do not (e.g.  $9/5$ ,  $8/5$ ,  $7/5$ ,  $6/5$  would be a "5 Otonality"). Thus the over (with an "O" as in, "Otonality") numbers are different while the under (with a "U" as in, "Utonality") numbers share a common prime/odd factor. Utonality is the reverse: The under-numbers are different while the over numbers share a common factor (e.g.  $7/4$ ,  $14/9$ ,  $7/5$ ,  $7/6$  would be a "7 Utonality").

The notes of the organ are laid out to make Otonalities and Utonalities easy to play. Otonalities form top-left to bottom-right diagonals and Utonalities form top-right to bottom-left diagonals. Within this limitation, the glasses form a more-or-less ascending scale as one plays from the bottom row (closest to the player) to the top.

## Layout of the Notes

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Key:



Where:

- Each circle represents a glass on the organ
- *Ratio* = Frequency of the note/glass (in Hertz divided by 440 (A))
- *Notation* = How the note is represented on paper (on the traditional European musical staff)
- *Cents* = The pitch (in cents) according to an electronic chromatic tuner (for tuning).

**Note:**  $Cents = 3986.313714 \times (\log Ratio)$

where *Cents* and *Ratio* are both in relation to A = 440 Hz.

## Notation

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One of the great difficulties of notating microtonal music in standard European Classical Music is the variety and number of accidentals that can render a piece nearly unreadable. In order to avoid excessive accidentals, all notes in these pieces are played natural unless there is an accidental immediately preceding them regardless of ties. Natural signs appear (parenthesized) in the music only as reminders.

The notated pitches represent the glasses to be played as well as the sounding pitches, but the pitches are not equivalent to standard musical notation. The natural notes sound as marked (in A major Just Intonation) but all sharps and flats raise and lower the pitch of the notes roughly half as much as they normally do. A double-sharp is roughly equivalent to a traditional sharp, similarly with double-flats. No enharmonic spellings are used.

When two staves are given, the top one is for the right hand, and the bottom for the left (as with standard piano notation). However, because of the construction of the instruments, the left hand tends to play higher notes (within an octave) than the right.

Two kinds of chord symbols are included in the Postlude that have more to do with Just Intonation and the layout of the organ than they do with traditional Western European music notation. The first kind of chord symbol is for the theorist. It's a number (2, 3, 5, 7, or 9) and a letter (o, or u) indicating which Otonality or Utonality to play (see my brief description of Otonalities and Utonalities above).

The second kind of chord symbol is for the player. It's a visual representation of the same thing applied to the organ. So instead of drawing a little picture of the layout of the glasses with notes like so:

oooo/o  
oo/oo  
oo/ooo  
o/oooo

Assuming that each "o" represents a glass, the slash goes through the notes to be played: 12/7, 3/2, 1/1, 6/5 or a "3 Utonality"

I abbreviate this as:

oooo/o  
3u

### **Fingering Abbreviations**

R Right Hand (generally the middle finger)  
RT Right Thumb  
RI Right Index finger  
RM Right Middle finger (specifically)  
RP Right Pinky  
L Left Hand (generally the middle finger)  
LT Left Thumb  
LI Left Index finger  
LM Left Middle finger (specifically)  
LP Left Pinky

### **The Pieces**

Prelude I can be played on either manual (octave) although the lower manual gives it a fuller tone. It emphasizes the ethereal floating quality of the organ. The March should be played non-rubato, but each note in the rest of the piece should be savored, and the next note should not be played until the performer feels it is right: the written durations are merely a guide.

Postlude I should be played as quickly as it can be played in time and heard clearly. The tempo marking is only a suggestion. This piece can also be played on either octave, although the higher octave speaks more quickly, facilitating a faster tempo.

# Glass Organ Prelude No. 1

Glen Peterson

♩ = 60  
*Slowly floating, rubatto* RT

Glass Organ

*ppp* *mp*

6

*mf* *p* *f* *let ring* *p* *Slightly Faster* RT

13

*p* *f*

19

♩ = 90

*p* *let ring* *rit. -----*

2  
25 ♩ = 90  
*March*

# Glass Organ Prelude No. 1

Musical score for measures 25-30. The piece is in 2/5 time with a tempo of 90 beats per minute. The key signature has one flat (B-flat). The music is marked *March*. Dynamics include *p*, *mp*, and *mf*. The score consists of two staves with eighth and sixteenth notes.

♩ = 60

31

*rit.* ----- *A tempo*

Musical score for measures 31-36. The tempo is 60 beats per minute. The music is marked *rit.* (ritardando) and then *A tempo*. Dynamics include *f*. The score consists of two staves with eighth and sixteenth notes. A fermata is present over the final measure of the system.

LT

37

*rit.* -----

Musical score for measures 37-42. The music is marked *rit.* (ritardando). Dynamics include *p* and *ff*. The instruction *let ring* is present. The score consists of two staves with chords and sustained notes. A fermata is present over the final measure of the system.

*let ring*

# Postlude No. 1 for Glass Organ

Glen Peterson

$\text{♩} = 70$

7u  
LT LM RT RM LM RT

3u

7u

*mf* *f* *mf*

5

5o

2u

10

7u

no chord

RT RP RI LI LP R L R

*ff*

15

LP LI R L LP LI R LP LI

20

7u

5o

2u

*mf*

25

7u

9o

3u

30

2o

5u

