

# Performing Microtonal Choral Music, Part 3: Rehearsal Tools for ‘You Were Fought For’

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*composer and musical director*

**The previous two articles in this series described some of the many ways that composers have used microtonal techniques for choral music, and provided some general tools for rehearsing such pieces. Now, this third article is a guide to rehearsing an entire piece. This piece, *You Were Fought For*, was written specifically for ensembles that have never sung microtonal music before.**

This is not a harshly dissonant piece! However, many of the chords are built on stacked 4ths, and this is a good gauge of the piece’s difficulty: if an ensemble can already confidently sing such non-triadic chords, then they are ready to approach the more advanced microtonal intervals in this piece.

The music was commissioned by Mary P. and Paul G. Koss, on a new text by Teré Fowler-Chapman. It was premiered digitally by Camerata Sonora, and can be viewed on YouTube or on [lopezhanshaw.com](http://lopezhanshaw.com). The digital sheet music, as well as the digital rehearsal aids and keyboard files discussed below, are available for free to readers of the International Choral Bulletin by visiting the online store at [lopezhanshaw.com](http://lopezhanshaw.com) and using the code “ICB2020.” A study score is printed along with this article, but it does not include the music for rehearsal keyboard.

After the discussion of *You Were Fought For*, this article briefly explores microtonal choral pieces from four composers, accompanied by some observations from other directors who have conducted microtonal vocal music. These pieces might also be suitable for an adventurous ensemble that is just beginning to explore microtonality.

## WHAT IS MICROTONAL MUSIC?

For those new readers who might be joining us: Microtonality is, very broadly, the use of pitches beyond the standard 12 chromatic tones. There are two main categories of microtonality in Western music: first, the use of intervals that conform to the natural harmonic series; and second, intervals that are smaller than a semitone.

**Figure 1** shows the first 12 partials of the harmonic series on A, with their deviation in cents (1/100 of a semitone) from standard chromatic pitches, and their frequency in Hz. Each subsequent pitch is an integer multiple of the frequency of the fundamental pitch. The harmonic series is present in every pitched sound that we hear. That is, every sung or played note contains its own entire harmonic series, sounding simultaneously, with the higher partials progressively fainter. This is the principle behind combinations of organ stops: when several pipes are sounded simultaneously, and they are tuned to the first few partials of a given harmonic series, it can sound like a single, unified pitch.



Figure 1

You will notice the altered accidentals on some notes of the harmonic series. These accidentals are based on a 72-tone equal division of the octave (abbreviated as “72edo”). **Figure 2** shows the accidentals in sequence, and their pitch deviation in cents from standard chromatic tuning. Coincidentally, it is possible to approximate the pitches of the harmonic series very accurately with 72edo.

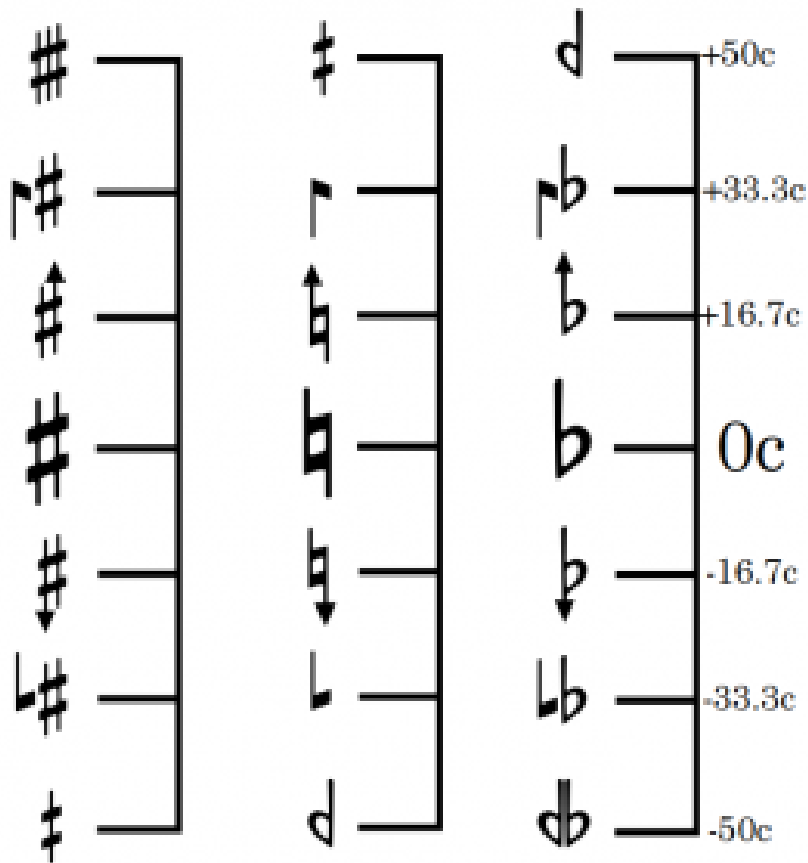


Figure 2

In “Just Intonation,” all intervals are tuned to be maximally consonant. To do this, intervals are selected from within a single harmonic series. The most consonant major 6th possible, for example, occurs between partial number 5 and partial number 3 (which means that the frequencies of the two pitches are in a ratio of 5:3). **Figure 3** shows several of the most common intervals in Just Intonation and their respective ratios. For convenience, they are all transposed so that the bottom note is C.

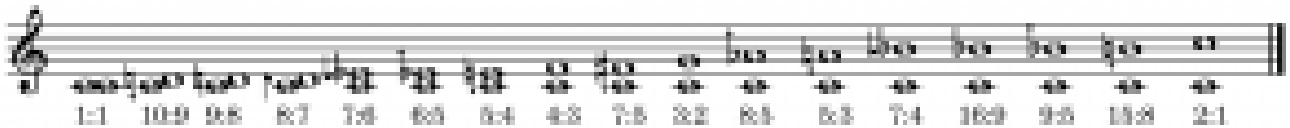


Figure 3

Although all of this background information may seem complex, it is not necessary for every singer to master it. They only need to know approximately how far, and in which direction, to “colour” each interval so that it is perfectly in tune. One step of 72edo is a twelfth of a tone, which is almost the smallest distance that is possible for a singer to control. So, for the most familiar intervals, it can be seen that 4ths and 5ths are unaltered; major 3rds, 6ths and 7ths are *slightly* lowered, as are tritones; minor 3rds and 6ths are *slightly* raised; and major 2nds and minor 7ths each have a few options.

There are only two “new” harmonic intervals used in *You Were Fought For*: the subminor 3rd and the supermajor 2nd, both of which occur between a minor 3rd and a major 2nd. In this piece, they are nearly always the result of a melodic passing tone between one semitone and the next. That leads to the next microtonal technique: small divisions of familiar intervals.

**Figure 4a** shows a semitone that is split into two equal quarter tones. **Figure 4b** shows a whole tone that is split into three equal third-tones. Third-tones can be represented, coincidentally, by the same accidentals that show the 7:6 and 8:7 intervals in Just Intonation. The way to tell the difference is that, in *You Were Fought For*, third-tones always occur as melodic passing tones that fill in a whole tone—in other words, two such accidentals in a row. Subminor 3rds and supermajor 2nds in the piece, in contrast, are isolated (see Figure 8 later on).

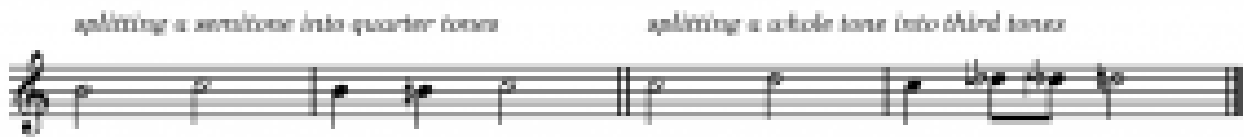


Figure 4

In addition to new melodic capabilities with these passing tones, it is possible to create new ways of resolving chords. **Figure 5a** shows a quarter-tonal progression of triads; **Figure 5b** shows a progression from the piece (mm87-88), using more coloristic chords. Both of these are impossible in 12-tone music. However, both can be readily tuned, even without an accompanying instrument, by using the rehearsal technique explained later in this article: splitting intervals in contrary motion.

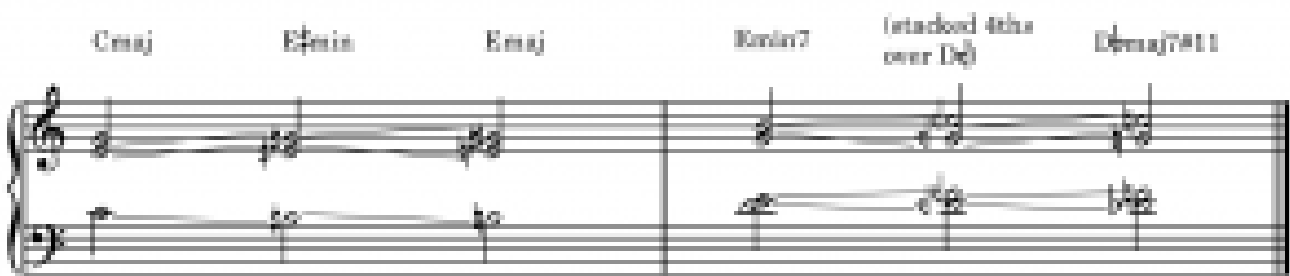


Figure 5

## REHEARSING THE MUSIC

It is important to incorporate these new musical materials into choral warmups at every rehearsal. If they are only practiced during rehearsal time for the piece itself, it will take far too long for singers to internalize them. Below are six strategies that I suggest for warmups.

### 1. Retuning the rehearsal keyboard

I strongly recommend using a MIDI-capable electronic keyboard to rehearse microtonal music in general. There are many programs available that can retune MIDI, but for simplicity, I prefer the free software BitKlavier ([bitklavier.com](http://bitklavier.com)). When the program is installed, and the

keyboard is attached to the computer, the user can load a file containing tuning presets. Each preset can be accessed by pressing a single key in the topmost or bottom-most octave of the keyboard (which is otherwise unused, and does not produce a sound). The accompanist follows a score containing normal fingerings, which are “mapped” to various microtonal pitches. In a very real sense, this is *scordatura* music for the piano. My piece *vokas animo* for choir and orchestra was successfully rehearsed using this method, and **Figure 6** shows a score excerpt. The sounding pitches are shown above what the pianist plays. The circled number indicates a change of tuning preset. Before the preset is activated, the key B4 sounds as B $\flat$ ; after it is activated, the B4 sounds as A twelfth-sharp.

The downloadable rehearsal materials for *You Are Fought For* include such a BitKlavier preset file, as well as sheet music for suggested exercises.



Figure 6

## 2. Practicing Just Intonation intervals

This process could hardly be simpler. One section should sing a drone; another section then sings an interval above the drone, and the goal is to inflect the interval

very slightly so it is absolutely in tune. Figure 3, above, already showed the inflection direction of common intervals. For these exercises, the choir should *not* use a standard piano—that would defeat the purpose, because such a piano can only play in 12-tone equal temperament. The choir should either use the included rehearsal presets for retuned electronic keyboard, or else no keyboard at all.

### 3. **Practicing characteristic chords**

If the choir is not used to singing in a jazz or contemporary idiom, then it would be useful to warm up by building some of the chords that commonly occur in *You Were Fought For*. The basic harmonic language of the piece varies between simple intervals against a drone, standard major and minor tonality, and chords built on fourths; although the latter often appear in inversions that produce seconds or thirds. **Figure 7** shows several common voicings of this last type.



Figure 7

### 4. **Splitting intervals in unison**

This exercise does not require a retuned keyboard; a standard piano could be used. The piano simply plays the outer pitches of a semitone or a whole tone, and then the choir repeats it. With that melodic “goal” in mind, the choir then sings it again, but includes the intervening microtones. Figure 4, above, demonstrates this for quarter tones and third-tones. This exercise is not very difficult! Singers might think of it as an “arrested slide”—a *portamento* into the next tone, but

pausing in the middle. It will take some work to unify the choir's intonation on the middle pitch (or pitches), but with the outer pitches as a guide, the exercise is surprisingly intuitive.

### 5. **Practicing advanced Just Intonation intervals**

When the choir is comfortable with splitting melodic intervals, they are ready for the next step. In the piece, the 7:6 subminor 3rd and 8:7 supermajor 2nd are used as harmonic intervals against a drone, not just melodic passing tones. The new intervals have a very distinctive "flavour" which becomes readily recognizable with experience. **Figure 8** shows these progressions in isolation, though they repeatedly occur in various contexts within the piece.

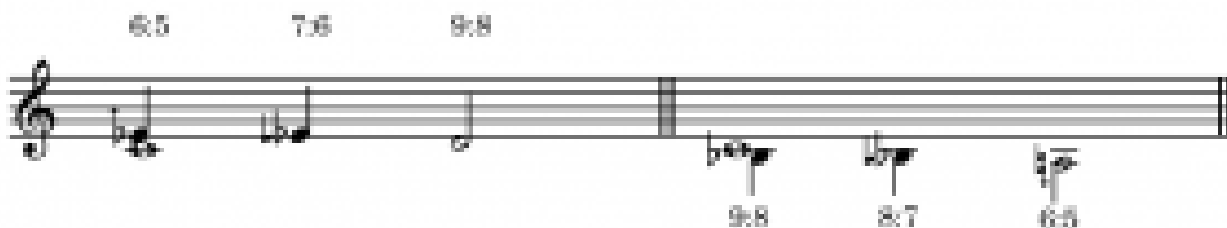


Figure 8

### 6. **Splitting intervals in contrary motion**

Even after some training, a choir will still be tempted to erroneously sing quarter tones as semitones—especially after a gap of some weeks in the rehearsal schedule. However, the very nature of quarter-tonal chord resolutions in *You Were Fought For* provides a potential check against this habit. When two pitches move by quarter tones in contrary motion, they produce an interval one semitone larger than the one they started with. For example, a major 3rd can resolve *outward* to a perfect 4th; a minor 3rd can resolve *inward* to a major 2nd. Practicing these basic interval resolutions strengthens a very useful skill. **Figure 9** shows some of the simple interval resolutions that are



integrated within chord progressions in the piece.



Figure 9

If voices in parallel motion move too far, they may still maintain the correct interval between them, just in the wrong place. However, if voices in *contrary* motion move too far, then it will be impossible to produce their target interval. So, this is a natural limitation on their melodic motion, helping them to only move by a quarter tone at a time. If each quarter-tonal resolution in the piece is first sung by only the voices that move in contrary motion, then the rest of the choir can tune around this nucleus of the chord.

## **LIMITATIONS AND CHALLENGES IN *YOU WERE FOUGHT FOR***

When writing this piece, I used both Just Intonation and quarter-tonal voice leading, but never layered them together. That is, when a chord is based on a quarter-tonal fundamental such as F quarter-sharp, none of its constituent pitches are inflected any further. Such a chord is thus in 12-tone equal temperament (displaced by a quarter tone)—not Just Intonation. I chose to do this in order to simplify the notation.

An additional limitation that I placed on the piece is that *no voice ever leaps by an unfamiliar interval*. All melodic leaps are by familiar intervals (although they might be slightly inflected for Just Intonation). *All microtonal motion is stepwise*, either by quarter tone or by third-tone; either filling in a familiar interval, or occasionally acting as a neighbour tone.

With that said, here are the places in *You Were Fought For* that may need the most work.

**Measures 25 and 28** – The inner voices resolve from a minor 2nd outward to a major 2nd in measure 25, then back inward in measure 28. In m25, this is easier because the alto and soprano are in parallel 5ths with each other, as are the tenor and bass. However, in m28, the alto and soprano resolve outward to a tritone, which is a more difficult target. In mm27-28, it may be helpful for the altos to hear themselves against the bass instead, going from a major 6th role to a minor 6th role.

**Measure 40** – The bass and soprano move in contrary quarter tones, but the alto moves in third-tones at the same time. It happens quickly enough that the precise tuning may not be an issue. However, this voice leading does result in the alto going from a *Just Intonation* minor third to major third against the bass's E quarter sharp.

**Measure 53** – The bass entrance pitch may seem tricky to find, due to the unfamiliar accidental, but it is only a perfect 5th below the soprano or a major 2nd below the alto.

**Measures 58-59** – The soprano goes from an A twelfth-flat to an A twelfth-sharp, which is necessary in order to have a Just major 3rd against the F followed by a Just minor 3rd against the F#. This is a neat trick, which can easily be lost amid general looseness of tuning, but the increased intensity of the crescendo will assist it.

**Measure 64** – The soprano must tune the A extremely sharp (as the accidental shows), an 8:7 over G, without resolving to a lower A afterward. That makes the pitch more difficult to find. However, the resulting half-diminished chord is in Just Intonation, using the *inversion* of the harmonic series (called the "undertone series") below G. This is a somewhat exotic theoretical construct, and the chord does also sound acceptable with a standard A, so don't lose too much sleep over this if it isn't working.

**Measure 73** – The alto goes from a standard A to an A twelfth-flat. If the motion is exaggerated, the resulting chord will be out of tune, so—depending on the progress of the ensemble—it might also have to be ignored.

**Measures 79-80** – Beat 2 of both measures respectively contain a 7:6 subminor 3rd, although the first such interval is read *downward* from the D, and the second is above an A twelfth-flat (so the top note features a quarter tone accidental). These are the only unusual spellings for this interval in the piece. They should be tuned just like the other subminor 3rds.

**Measures 82-83** – The alto and tenor alternate between having major 2nds and minor 2nds between them. Once again, if they can focus on their respective harmonic roles against the bass, rather than against each other, it will aid clarity considerably.

## **A NOTE ON DIGITAL REHEARSAL TECHNIQUES**

Due to the pandemic, in many areas, choirs are unable to meet in person. Many of us have taken to creating digital video collages, and holding virtual rehearsals of various kinds. In the pages of this magazine and elsewhere, we have all encountered advice and thoughts on the best practices in this rapidly changing era, so I only have a few things to add with regard to this piece.

Firstly, for most singers, a rehearsal track *with a voice*, rather than a synthesized instrument pitch, will be easier to follow and more comfortable to sing with. I cannot provide live rehearsal tracks in my digital materials, so the conductor or section leaders could do this themselves for their ensemble, and record themselves singing along to my synthesized tracks. This would also provide choir members the comfort of singing with familiar voices.

Secondly, people enjoy the communal act of practicing together, even when they cannot hear everyone! The sense of

community is somewhat maintained when a conductor holds a digital rehearsal, even when singers are asked to mute themselves and sing along with the conductor for a passage. (This is most adaptable to sectionals.) *For You Were Fought For*, group practice is especially important, because singers will quite likely have an abundance of questions at each step.

## OTHER SUITABLE REPERTOIRE

Most existing microtonal choral repertoire is only suitable for extremely advanced ensembles—perhaps even elite, virtuosic ensembles. However, more approachable music does, also, exist. Below are some works by four composers, which may also provide excellent entry points into microtonal choral music.

### ▪ *Rose and I'm Goin' Away* by Ben Johnston (SATB)

These pieces, written one year apart, have something like a perfect balance of the familiar and the strange. They use recognizable scales, but they add harmonies based on the 7th partial of the harmonic series (chiefly the intervals 7:4, 7:6, and 8:7 over different roots). *Rose*, in particular, is performed with some frequency. It was originally composed for a high school ensemble. The contemporary vocal ensemble Ekmeles (an elite group, to be sure) has performed it; but Ekmeles' director, Jeff Gavett, has also run workshops of that piece with college ensembles. He has this to say about discovering new harmonic intervals:

“For simpler [Just Intonation] relationships, we just know the characteristic sound of the overtone, and I find that flavour carries into other ones. So, if someone has a good 7:4 in their ear, a 9:7 is a major third with a ‘7 flavour’ of buzz to it.” Indeed, although Ben Johnston's notation can be somewhat confusing—and the tuning theory behind it can get quite deep—Johnston himself was not as concerned with the theory as with the execution. Gavett continues: “When I asked Johnston about some accidental questions in

Sonnets [of Desolation, a much more complex piece], he basically brushed the question off and said, 'Make it sound good.' It made me think, 'Oh, right, this is music, and we are performers who need to make it sound good. The math and lattices and everything are just a way in.'"

Ben Johnston's music is available from Smith Publications.

▪ ***Kolme Madrigaalia (Three Madrigals) by Juhani Nuorvala (SSAATTBB)***

These pieces have been performed multiple times by the Helsinki Chamber Choir, which commissioned them in 2007. They are written in Johnston's notation system. Nuorvala was prolific in preparing digital rehearsal materials for the choir, including exercises in Just Intonation intervals with a synthesized accompaniment, as well as renderings of the music itself for study. The character of the music is quite beautiful, and evocative of folk music, although it is more complex than the Johnston pieces above. In the latter, Johnston limited himself to intervals involving the 7th partial. Nuorvala's madrigals include harmonic intervals that involve the 11th partial (see Figure 1); or in other words, true quarter tone harmonies.

Still, the voice leading is very manageable, and the extensive digital rehearsal materials make these pieces potentially approachable, with some individual study on the part of the singers. Singers are not required to make leaps of large, microtonally-altered intervals, but the major novelty of this piece is that singers do often move by a *neutral* second—the quarter tonal interval between a tone and a semitone. The next two pieces also feature melodic neutral intervals between major and minor.

Juhani Nuorvala's music is available from Music Finland.

▪ ***Alleluia* by Aaron Krister Johnson (SAB or AAB)**

This piece, from 2008, was written in a 17-tone equal division of the octave. This may seem exceptionally forbidding, but 17edo has a surprisingly friendly quirk. Perfect fourths and fifths are acceptably in tune; all of the familiar major intervals are included, but inflected sharper than usual; all of the minor intervals are also there, but flatter than usual; and five “neutral” intervals are added: the 2nd, 3rd, 4th, 6th, and 7th. It is a very rational extension of the idea of 12-tone temperament, so it has attracted plenty of theoretical attention through the ages.

The *Alleluia* itself has been performed live multiple times, including a radio broadcast. The piece is “neo-medieval” in character, making heavy use of sonorities built on perfect 4ths and 5ths, but neutral 2nds and 3rds are used frequently in individual melodic lines. Robert Reinhart, a composer and researcher who also teaches ear-training at Northwestern University, shared some strategies for developing familiarity with such neutral intervals:

“One strategy... was attempting to find a quarter-tone interval by ‘surrounding’ it, e.g. singing a major third and a minor third repeatedly so they were rock-solid, then inserting a ‘middle’ third into the repetition, and listening to eliminate its leaning toward either the major or the minor third too much. [...] At times, we also employed the common-sense strategy of simply leaving out the quarter-tone notes, e.g. when rehearsing individually, placing a rest where the quarter-tone pitch was and making sure the passage was otherwise completely secure before attempting the trickiest pitches, or, when rehearsing chords as a group, building them by placing the chromatic pitches first and adding the quarter tones after.”

Aaron Krister Johnson’s music is available by contacting him through <https://aaronkristerjohnson.bandcamp.com/>.

His *Alleluia* is also published in the compilation *The Sagittal Songbook*.

▪ ***Kyrie, Sanctus, and Agnus Dei, by Lillian Hearne***

Lillian Hearne is a researcher in the field of music cognition, as well as a composer. These three movements of a Mass are set in 22-tone equal temperament. Again, it sounds daunting. Yet, once again, familiar intervals are actually well-represented—just with a twist.

Let us go back to Just Intonation for perspective. From Figure 3 above, it's clear that the 10:9 D pitch and the 9:8 D pitch have different functions. The first creates a perfect 5th with the 5:3 A, and the second creates a perfect 5th with the 3:2 G. However, in standard 12-tone equal temperament, the difference is averaged out, or "tempered," and we have only one D that fulfils both functions.

22edo has the capability to "temper out" the difference between some rather exotic intervals. And that's what Hearne has done. In these three very short and quite approachable pieces, she has demonstrated three different schemes of "temperament" that are all supported by the underlying 22edo framework. In *Sanctus*, perhaps the most charming movement, something like a recognizable major scale is used—but most steps are only 163 cents wide, so the major 3rd of one chord may then act as the neutral 4th of the next chord (i.e. the 11th partial, 11:8) without changing pitch. This is made possible for singers by very sensitive part-writing, and again, the availability of digital rehearsal tracks.

These pieces have been performed live, in addition to digital-choir video format. They are available by contacting Lillian Hearne at [lillianhearne@gmail.com](mailto:lillianhearne@gmail.com).

Microtonal choral music is gradually growing beyond the purview of virtuosic ensembles—and these pieces would make an excellent start. The path of microtonality has been very strange and very rewarding for me as a

composer, conductor, and listener. I hope it may be the same for you.

### **Download *You Were Fought For* for Robert Lopez-Hanshaw**



**Robert Lopez-Hanshaw** is the Music Director at Temple Emanu-El in Tucson, Arizona, and Guest Composer in Residence with the Southern Arizona Symphony Orchestra. He is also the editor of “Practical Microtones”, a compendium of fingerings and playing techniques in 72tet for all standard orchestral instruments, to be published in early 2021. Lopez-Hanshaw is a clinician on

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*Edited by Olivia Scullion, UK*