"Three Beats for Beatbox Flute" by Greg Patillo

In 2011, the National Flute Association (NFA) commissioned the piece "Three Beats for Beatbox Flute", composed by Greg Patillo, for the NFA Convention, High School Competition. The piece was "specifically written to bridge the gap between the traditional western flute style and the growing art of Human Beatboxing." For this analysis, audio from the competition winner, Annie Wu, will be used. A recording of this performance can be found on Patillo's YouTube channel[1]. This piece is interesting because of its full and varying sound, despite being performed by just one flautist.

The piece has three movements: the first movement is to be played mysteriously, with gradual and enticing diminuendos and crescendos. The second movement has a brisker pace and

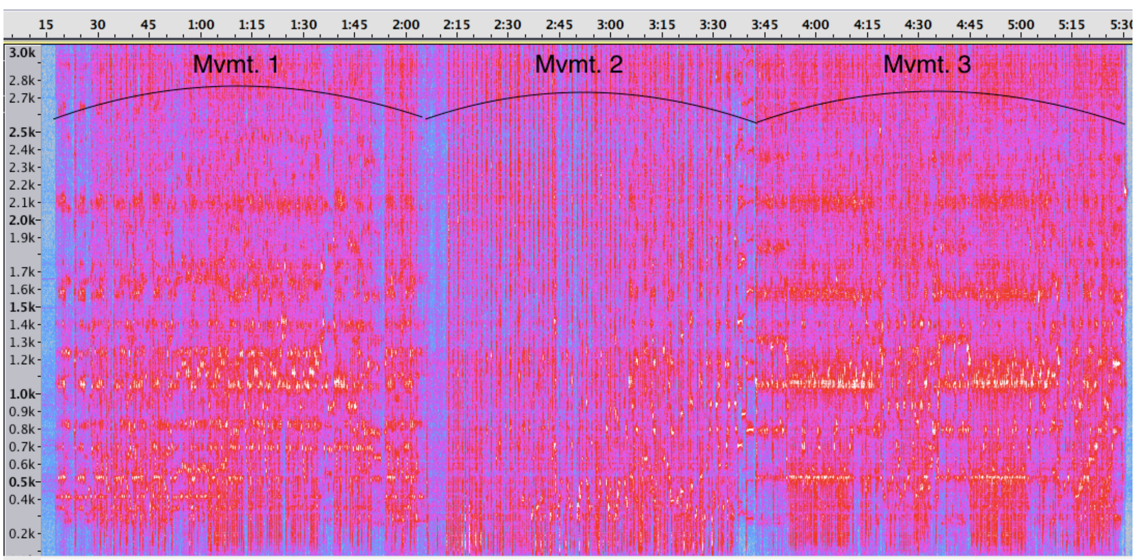


Figure 1. *The entire spectrogram is shown to highlight the contrast between movements.*

style, with greater emphasis placed on the vocal percussion while the third movement is punky and wild, with a driving beat and a rough edge. The changes between movements are clear in the spectrogram; the second movement differs starkly from the first and third as it lacks the high frequencies provided by the flute. Because the first and third movements both have fast flute

[1] Link to Annie Wu's performance of "Three Beats for Beatbox Flute" can be found here .

tones, they look quite similar on a large scale. However, the energy and disorganization of the third movement is evident by the lack of space between notes, indicated by the almost solid red appearance of the spectrogram (see **Figure1**).

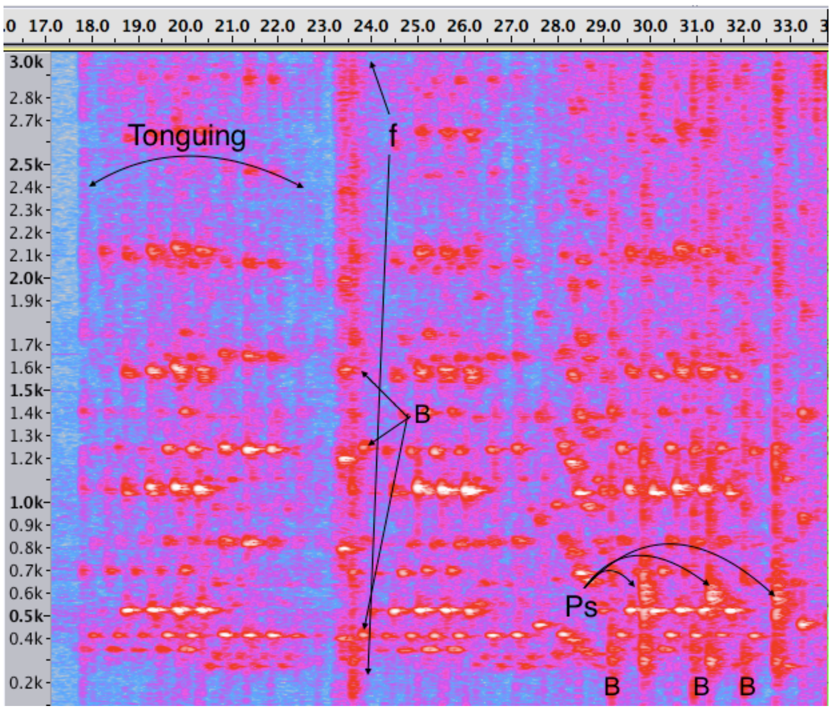
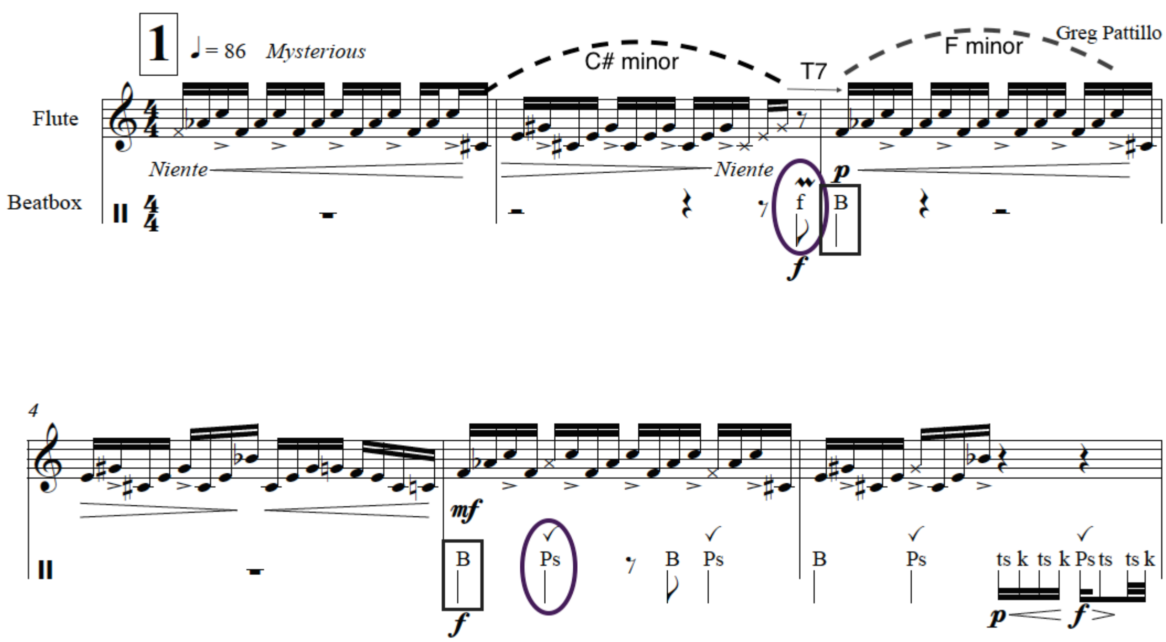


Figure 2a. (*left*) *Measures 4-6 are shown, with the individual tonguing in the first 2 measures, the f beat in the second measure, and the Ps beats in measures 5 and 6 marked.*

Figure 2b. *(bottom) The same features are marked in the score of the music.*



The first movement begins with flute tones alone. The accented tonguing on approximately every third sixteenth note provides softer percussion noise visible in the spectrogram. In measure 5, the beatbox line picks up and gives a harsher sound to the accented notes. This is visibly darker on the spectrogram and mirrors the percussive strikes created by drums and cymbals. The differences between beats is clearly shown as well, in **Figure 2a**; the Ps sound, as indicated in the score (**Figure 2b**) creates a louder sound, brighter on the spectrogram, while the vibrated f sound is less intense but very clearly sounded through a wide range of

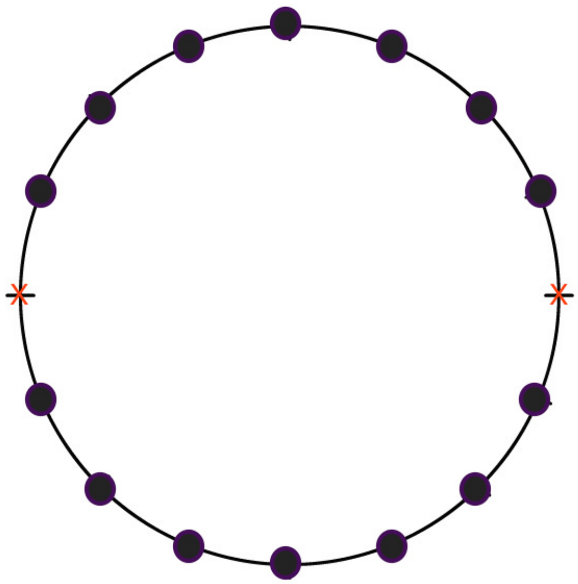


Figure 3. *The 12 o'clock position marks the first beat in measure 14. The red x indicates the vocal percussion beat. This rhythm is repeated in measures 16, 18, 19, 20, 23, and 27.*

frequencies. Both the f and Ps sound are followed by a B sound, indicated in the **Figures 2a** and **b**. The sound of a bass drum kick is meant to be produced by this sound, thus it appears in the very low frequencies of the spectrogram.

These flute tones are eighth notes played in ascending groups of three, creating an arppegiated chord. In measure one, the F minor chord (F-A$^{\flat}$-C) is arppegiated and repeated five times. In the last beat, the arppegiated chord undergoes a T_{-4} transformation. Measure two repeats the arppegiated C$^{\#}$ minor chord (C$^{\#}$-E-G$^{\#}$) five times, although the fifth repetition is replaced by vocal percussion. A T_4 transformation occurs and the F minor chord is played again. This is shown in **Figure 2b**. The arppegiated F and C$^{\#}$ minor chords alternate every measure until measure 13.

In measure 13, the first movement begins to build in excitement. The piece continues to build until measure 28. This is achieved by a repetition of rhythm in conjunction with a continually rising pitch and volume. The rhythm clock shown in **Figure 3** indicates the rhythm first appearing in the last beat of measure 13 and continuing until measure 28. In measures 15 and 17, the same rhythm is repeated but the second sixteenth note is replaced by a vocal percussion beat. Measures 19, 22, and 26 feature a long run going down the F harmonic minor scale. Although the piece is written in the key of C, the A, B, and D flats, and E natural indicate that the run is the F harmonic scale. This run keeps the energy through the sixteenth notes, but delays the onset of the climax, as the descending scales causes a natural decrescendo. Volume over 10 measures is difficult to see on the spectrogram, but it is clear that the notes are getting higher. As notes get higher, a natural crescendo occurs; Wu uses this to her advantage as she interprets the piece and plays with increasing volume until measure 28. At measure 28, the peak is hit with the F_6 note. This note was played in measure 24 and although this is also a point of high energy, it is clear that this is not the peak of the movement. Measure 24 is distinguished from measure 28 because measure 24 has a beat in the vocal percussion line directly after it, pushing the music forward. In measure 28, the beatbox line drops out causing energy and pitch to decrease. The beat later picks up, but the piece is declining from the climax in measure 28.

Before the climax is reached in measure 28, there are other indicators of its arrival in the beatbox line. Measure 13 begins with minimal vocal percussion, using the lighter ts sound in addition to the B and Ps sounds. In measures 15-17, the use of percussion increases until measure 18. Here, a consistent beat pattern is set, using B and Ps, and can be see in **Figure 4**. This pattern continues until measure 28, with slight variations appearing in measures 20, 27, and 28. In measures 22, 24, and 26, the rhythm is the same but the last beat, a B sound, is replaced by a rest. The relatively uniform pattern helps push the music to the climax.

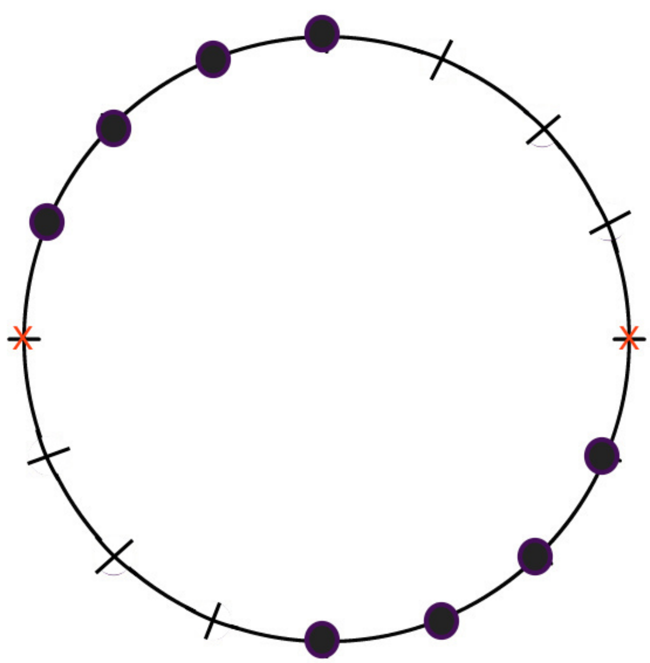


Figure 4. *12 o'clock marks the first beat in the beatbox line of measure 18. The circle mark the B sound while the X indicates the Ps sound.*

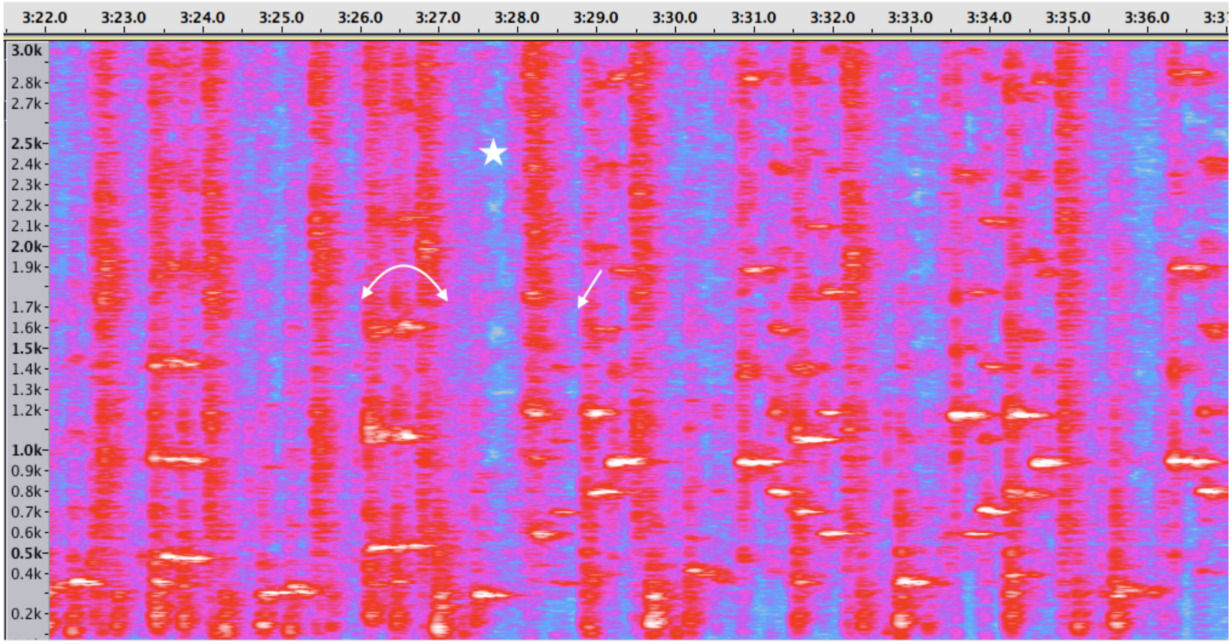


Figure 5. *The curved arrow indicates eighth notes played without space; note the lack of blue (very quiet/no sound). The star marks the time at which the flautist is instructed to "hold back". The straight arrow indicates space between eighth notes, clear by the presence of blue.*

Towards the end of the second movement, it is possible to hear the strain Wu places on the notes' forward momentum. This is indicated in the score (measure 71) with the instructions for the flute notes to be "held back". Each note is played with a greater individual intensity, giving the illusion of space and reluctance. Further analysis of the space between the notes seems to reveal more space between the held back notes. See **Figure 5**. In the first beat of measures 67-70, two eighth notes are played; in 71, eighth notes are played again, but the flautist has been instructed to hold back. When comparing the spectrogram to the score, it is clear that some of the "extra" space between notes can be attributed to the change in the beatbox beat. Although this is not something done by the flautist, Patillo's choice of beat adds to the style of the second movement and enhances the flautist's interpretation of space between notes. The vocal percussion in measure 71 is used to cause a noticeable change in the notes.

Figure 6. *Measures 74 and 75 are shown. The top line represents notes played on the flute and the bottom line indicates the note to be sung.*

The space between these eighth notes causes the music to slow down, indicating the near end of the movement. The eighth notes are followed by three long tones played on the flute in conjunction with vocal notes. The two instruments, voice and flute, create a dyadic chord. The first long note is an F_5 on the flute and an F_4 sung. The interval

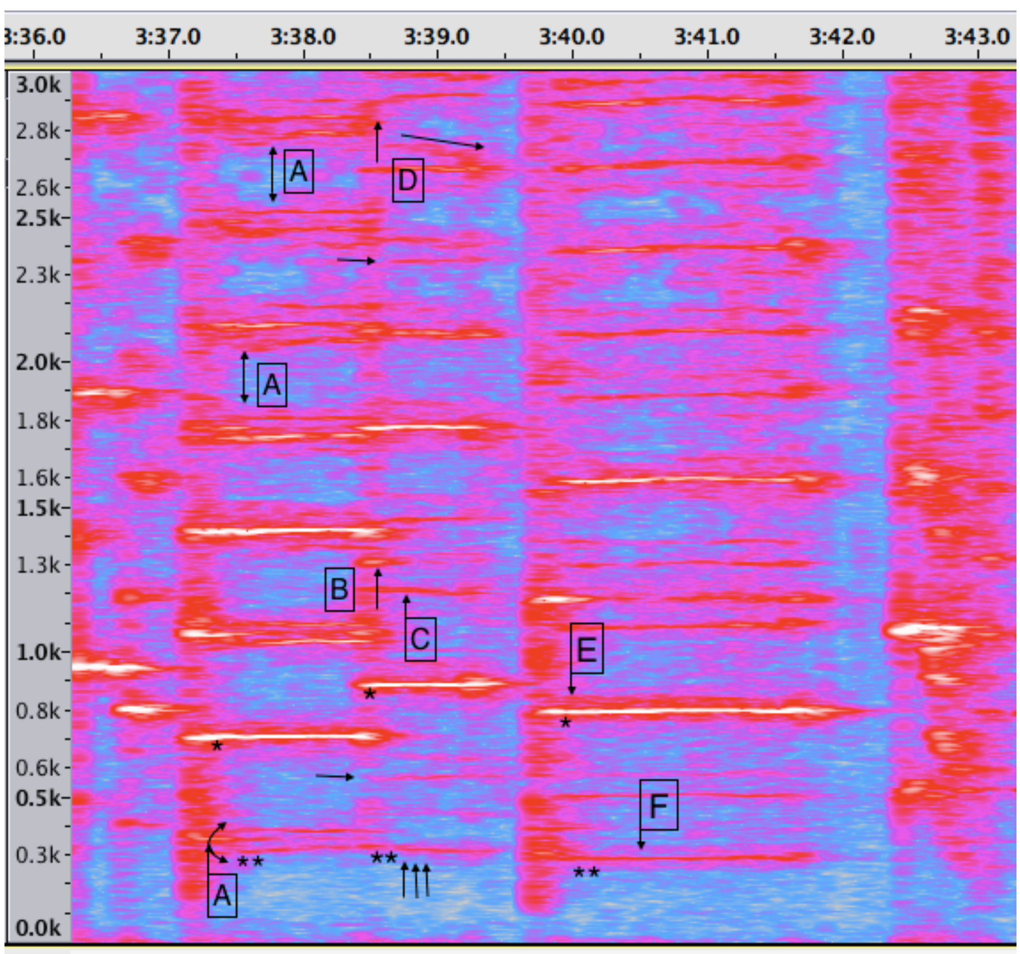


Figure 7. *The long tones from measures 74 and 75 are analyzed. Labeled arrows indicate note frequencies identified. The single * indicates a flute tone while the ** indicates a vocal percussion tone.*

created by these two notes is an octave. On the spectrogram, however, frequencies of other than that of the note F can be seen in the fundamental and higher frequencies, labeled by arrows A in **Figure 7**. The lowest arrow A shows a group of dissonant harmonics. When listening to the recording, this makes sense as dissonance can be heard; without the spectrogram it is difficult to describe the dissonance because the score indicates an octave between the sung and played notes. Between the first and second tone, the change in fingering creates a different pitch as indicated by arrow B. The second long note is written in the score as an A_5 on the flute, which agrees with the spectrogram, and F_4 sung, which does not agree with the spectrogram. These two notes create the harmonic interval of a major third so it makes sense that the sung note does not sound as it is written because dissonance can be heard. In the spectrogram, the pitch F_4, which begins near the lowest arrow A, bends down to the pitch $D^{\#}_4$ at the location of the three grouped arrows. This pitch that goes from F_4 in the first two beats of measure 74 to $D^{\#}_4$ in the last two beats of the measure is the sung note. These would account for some of the dissonance heard by the listener, but not produced by the chord written in the score. In addition, the two horizontal arrows indicate where harmonics of $C^{\#}_5$ can be seen, adding to the dissonance. In the upper frequencies, pitch bending can be seen (arrows D) that also contribute to the dissonance. This bending probably resulted as Wu strained to hold a sung note and played note. The last tone, which is held with a fermata, is a G_5 on the flute and a D_4 sung (arrows E and F, respectively). Together, this is perfect fourth.

Throughout measures 74 and 75, it is also worth noting that the fundamental frequencies for the sung tones (marked by a double **) are significantly less intense than those for the flute tones (marked by an *). The vocal sounds appear in fuzzier lines, similar to the fuzziness seen with the vocal percussion. Both instances, although stylistically and musically very different, use vocals as a sort of sound-filler or backdrop for the flute.

In measures 101 and 102, other notes that are not being fingered can be heard. The same seven sixteenth notes are repeated, but in the second set they are written down an octave. In the audio, however, the overblown tones can be heard an octave above the written tones, which can

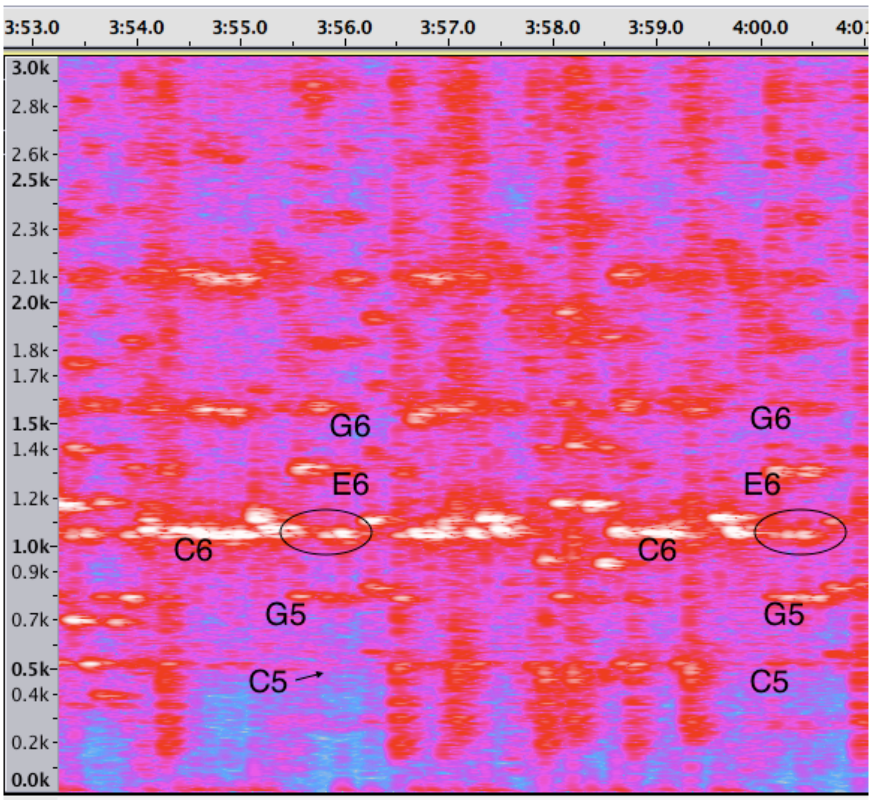


Figure 8. *The notes written in the score, C_6 and C_5 are marked. A circle encloses the overtone that sounds C_6 with almost as much intensity as the note actually played at that frequency. The fingered notes being overblown cause this noticeable sound.*

also be heard an octave lower. See **Figure 8**. Although this technique is not a form of beatbox, it is a style that is not typically implemented in classical flute music. In modern pieces, such as this one, unique styles add interest to the music. It is not entirely clear from the score whether this sound was intentional or an accidental result of vocal percussion sung with the flute tone. However, it adds to the chaos of the movement and does not sound out of place. It is interesting that some of the loudest overblown tones create the C major chord (C_6-E_6-G_6). This explains why although the overblown notes sound different, they do not sound dissonant. The frequencies produced by overblowing created a major chord, which is composed of consonant intervals.

The third movement's chaotic sound is also characterized by the rhythm produced in the beatbox line. Here, a combination of eighth notes, dotted eighth notes, sixteenth notes, and thirty-second notes played in 2/4 time compliment the rhythm played by the flute. Although this movement has is characterized by is rowdiness, measure 155 marks a section that is to be "more relaxed, but pushing towards the end". The push is caused by two main beatbox rhythms. The punky feel is not completely lost, however, as measures varying slightly from the main two rhythms and the flute tones break up the pattern. The two main beatbox patterns that are found can be seen in **Figures 9a and 9b**. Both begin with one longer sound, with faster sounds coming toward the end of the measure. This helps push the music forward while the long sound adds a relaxed feeling.

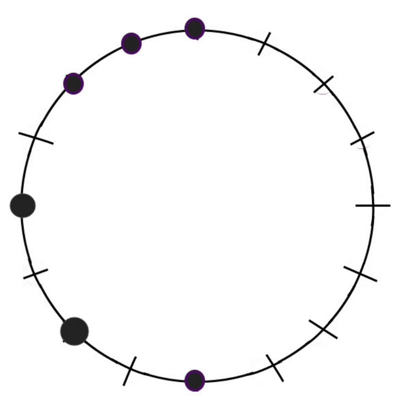


Figure 9a. *This pattern appears in measures 155-157, with variations in 158.*

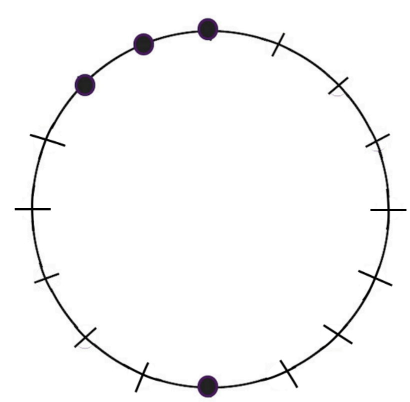


Figure 9b. *This pattern appears in measures 160-161 and 164 with variations in measures 159, 162-163, 165-167, and 168.*

The flute is usually confined to one tone, but the addition of vocal percussion and sung notes allows for interesting sounds to be produced. Patillo uses three movements to highlight three different styles of playing and beatboxing. Within these movements, rhythmic patterns and natural dynamic changes contrast the contemporary additions of vocal percussion and other, techniques, like the simultaneously sung and fingered notes, that create sounds beyond those created by only fingering the notes. These additions are reminiscent of jazz flute techniques, which began emerging in the mid 20^{th} century. As a composition for a competition, this piece intentionally includes a variety of styles and techniques. Annie Wu's performance is one interpretation of the piece; her beatboxing and vocals are that of a young woman. In other performances, different sounds are made depending on the voice of the performer. This leaves many of the piece's characteristics up to the performer; because of the vocals, this flute piece becomes a much more personal interpretation.