

TECHNIQUES TO OBTAIN MICROTONES ON THE CLASSICAL GUITAR AND HISTORY OF MICROTONAL GUITAR

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In the 12 tone equal temperament system which has been the dominant system in classical Western music since 19th century, the octave is divided into 12 half tones. Accordingly, the frets and keys are half tone apart on conventional guitar fretboards and piano respectively. In classical Western music theory, the term microtone is used for a pitch less than a half tone. In the broadest sense, microtonal music may refer to any piece that has microtones. Microtonal music also encompasses music that has microtonal intervals such as pieces in Pythagorean tuning, just intonation, meantone temperament or well temperament.

An octave can be divided equally other than twelve notes. This type is called ‘Equal Tempered Microtonality’ such as the division of 17, 19, 22, 24, 31 tones per octave. In the 20th century, Mexican composer Julian Carrillo divided the octave into 96 tones and Czech composer Alois Haba into 24 tones.

Traditional music of many cultures includes microtones such as Middle Eastern, Indian, Thai, Vietnamese or Balinese. For instance, in Ottoman/Turkish music theory which is based on modes called *makam*, microtones are essential elements. According to an established but highly controversial theory by Sadettin Arel, a whole-tone is divided into 9 equal parts and there are 24 unequal pitches per octave in Ottoman/Turkish maqam music¹.

¹ For a detailed critique of this theory, Turkish music theorist Ozan Yarman’s PhD entitled ‘79-tone Tuning & Theory for Turkish Maqam Music as a Solution to the Non-Conformance Between Current Model and Practice’ can be read on www.ozanyarman.com/files/doctorate_thesis.pdf

TECHNIQUES TO OBTAIN MICROTONES ON THE CLASSICAL GUITAR

To date, many guitarists/composers have tried various techniques to achieve microtones on the standard classical guitar:

1) Bending: Microtones can be achieved by bending the strings with the left hand fingers. The tone gets higher as the string is bent. For example, Argentinian guitarist Ricardo Moyano used bendings in his Turkish folk music arrangement (*Kara Toprak* by Aşık Veysel) in order to obtain a microtone in Hüseyni mode/*makam* which is 35 cents lower than a half tone.

2) Tuning a string: Microtones can be achieved by tuning an open string for a specific microtone. All the frets on the tuned string sound in accordance with the microtonal open string. For example, one of the guitars has been tuned a quarter tone higher than the other guitar in Turkish composer Tolga Tüzün's piece for two guitars 'Two Miniatures.' Spanish-Austrian composer Agustín Castilla-Ávila has been using this technique for his compositions. He has developed a sixth-of-a-tone system for classical guitar by tuning the strings. In this category, microtones can also be achieved during the course of the performance by turning the tuning peg after plucking the string.

3) Plucking Between the Fretting Finger and the Nut: In this technique, one of the left hand fingers presses a fret and the right hand plucks the string between the fretting finger and the nut. The resulting tone is a microtone. John Schneider called this technique 'Plucked Upper Bittones' (Schneider, 2015: 104). Turkish composer Ceyhun Şaklar used this technique in the introduction of his piece entitled 'Imitations of Anatolia No.3.' In this category, playing the strings on the headstock above the nut also produces microtones.

4) Using a Tool for Glissando: Electric guitar slides, pencils or even pestles can be used to achieve microtones on the classical guitar. These tools are touched gently on any string and obtain microtones when glissando is made. For example, Turkish composer Mustafa Tınç used a pestle to play microtones in his piece for two guitars entitled 'It Takes Two.' Similar effect can be obtained by the left-hand fingers. This technique is generally called 'Surface Pizzicato' (Schneider, 2015: 100).

5) Harmonics: Every sound consists of several resonating partial tones. These notes derive from the harmonic or overtone series of the root note and they are microtones. On guitar, playing harmonics is a common technique. For instance, the harmonic on the guitar's 4th fret is 14 cents lower than the half tone.

6) Vibrato Bending: When a left-hand finger presses a fret and moves the fret to the left or right without releasing any pressure, the pitch gets higher and lower respectively, achieving microtones. The string should not be bent upwards or downwards. On the contrary, the left hand finger pulls the string horizontally as in a vibrato.

HISTORY OF THE MICROTONAL GUITAR

The techniques mentioned above have been used for microtonal effects in many pieces of the repertoire; however they are insufficient to play many genres of microtonal music on the guitar. Therefore, modifications on the fretboard have been made since 19th century.

- 1) Enharmonic Guitar: Perronet Thompson invented the 'Enharmonic Guitar' in 1829. On this guitar's fretboard, there are many holes and small frets can be inserted into these holes for playing microtonal music.
- 2) Movable Fret Guitars with Channels under each String: The first guitar that has movable frets was made by René Lacote in 1852. This guitar's small frets can be moved in a limited way (in short distances) in the channels along the fretboard. In 1977, Daniel Friederich designed a guitar with movable frets that he called 'Meantone Guitar' (Friederich, 2013: 29). In 1985, German luthier Walter Vogt invented another movable fret guitar. Tolgahan Çoğulu designed the adjustable microtonal guitar in 2008, inspired by Lacote's and Vogt's guitars. The guitar was made by Turkish luthier Ekrem Özkarpaz. Different than the other guitars, small frets can be inserted into or removed from the fretboard practically from over the fretboard. On the other designs, all the frets should be removed and reloaded from the end of the fretboard for adding or removing frets which is an impractical and time consuming method.
- 3) Fretless Guitar: American composer Harry Partch's 'Adapted Guitar II' was a fretless guitar he played in 1945. Turkish guitarist Erkan Oğur has been playing fretless guitar since 1970s in order to play microtonal traditional music of Turkey. The fretless guitar has no frets on the fretboard. As on the Arabic necked lute 'oud,' all microtones can be played on the fretless guitar. Fretless guitar's timbre is very different than the classical guitar.
- 4) Use of Small Frets, Additional Standard Frets and Curved Frets: Small frets can be taped or inserted into any part of the guitar's fretboard. Guitarists such as John Schneider, Tolgahan Çoğulu, Lily Afshar, Onur Türkmen have been using small frets on their guitars. These frets are fixed and cannot be moved from the spots where they

are taped or inserted. Additional straight standard frets can also be inserted into the fretboard. Luthier Baudelio Garcia made quartertone guitars by inserting additional frets halfway between each half tone frets in 1925 for the Mexican composer Julian Carrillo (Schneider, 1985: 160). Tolgahan Çoğulu has been using taped frets for teaching polyphonic microtonal Turkish music on the guitar at Istanbul Technical University since 2014.

Tom Stone invented 'Guitar with Interchangeable Fingerboards' in the early 1970s. Various fretboards with small and additional straight frets in various tuning systems can be placed onto a classical guitar's neck without a fretboard. John Schneider and Ron Sword have been playing with this guitar. Changing the standard fret's shape is also a method used by Anders Thidell for achieving different tuning systems. These frets are called 'Curved Frets' (Thidell, website).

CONCLUSION

There are six techniques for achieving microtones on the standard classical guitar. However, in order to play microtonal music such as just intonation, meantone temperament pieces or traditional Middle Eastern music, these techniques are insufficient and modifications on the fretboard are inevitable. Since 1829, there are four different ideas for the guitar's fretboard: holes, channels, fretless and the use of small/additional standard/curved frets. The search for the ideal design has been going on and by the help of these designs; microtonal guitar world keep contributing to the future of music.

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