

# The World of Harry Partch on Adapted Classical Guitar.

*Arranging Two Studies on Ancient Greek Scales and The Letter.*

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## Foreword

The music of American composer Harry Partch (1901-1974) seems to arrive from another planet. Yet, as John Schneider comments: “it is somehow deeply familiar”.<sup>1</sup> Partch’s unique repertoire continues to fascinate musicians around the world. Even punk icon Iggy Pop acknowledges that Partch’s music had a musical impact on him.<sup>2</sup> When I heard *The Letter* (1943) – for voice, Adapted Guitar and Kithara – for the first time I was intrigued by these new, offbeat sounds. I also imagined playing this piece on my classical guitar while intoning the voice part. But I was still unaware of the fact that Partch’s music is exclusively performed on his self-made just intonated instruments.

I have to confess that I started this paper without any notion of different intonation systems, let alone of instrument building. I anyway delved into Partch’s music theory and his instruments. The discovery was fascinating, but at times I got really confused. Every time I got hold of one of the theoretical concepts it made a lot of sense, but then a new concept would arrive that did not. In the end I would need a lifetime to grasp the composer and his music completely. The music mirrors his scientific theory, and is at the same time poetic and expressive. *The Letter* for example is a timeless composition: it is humorous, yet bitter and depressive; it uses minimal means, yet has a very profound meaning and social critique. Furthermore, the sound is incredible, but very absurd when you are only used to hear Western music (classical, pop, jazz.. etcetera.).

The arrangements for classical guitar try to stay close to Partch’s philosophy and primitive sounds of his instruments. At the same time the compositions will be made performable for a classical guitar. They resulted from a thorough research of the original scores, Partch’s instruments and theory. They would not have been possible though without the help and shared knowledge of Partch’ researcher and London-based steel-string guitarist Chris Rainier with whom I stayed in touch during the process of this thesis. I started having contact with Rainier in March 2019 after I had just discovered his work on Partch online. He then shared the different versions of *The Letter* with me that enabled me to transcribe the work for guitars. Furthermore, he explained many Partch’s instruments and how to decipher their specific tablatures. In the end, he had me reconsider re-fretting or adding extra frets (see Chapter 4) and launched the idea of playing two guitars in different tunings by only one musician. Thanks are also in order to luthier Koen Fonteyne who painstakingly re-fretted the instrument; Pieter-Jan Vercaemmen for having the courage to play the arrangements with me on recordings, and my supervisor Nico Couck for the guidance and advice during the writing process.

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<sup>1</sup> Schneider (Regenesis: 15).

<sup>2</sup> *Gimme Danger*. Dir. Jarmusch, J. Amazon Studios, 2016, DVD.

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## 1 Introduction

It is a challenge to translate Partch's otherworldly musical language for the classical guitar. When arranging the music of Partch there is no denying his escape from equal temperament. The music is composed exclusively for his self-built instruments in a forty-three just intonated scale.<sup>3</sup> Therefore, any attempt to arrange his music for traditional equal tempered instruments is contradictory.<sup>4</sup> Nevertheless, an attempt to arrange Partch's music for an 'adapted' classical instrument can shed light on both Partch's repertoire and on the sound prospects of the guitar – so let this research not be for nothing! An arranger of Partch's music must try to grasp his musical theory described in *Genesis of a Music* (1943, 1949).<sup>5</sup> Next, one is obliged to work from the original scores and to decipher Partch's hand written notation. There remains the task to scan the possibilities of playing the non-western tones on a traditional instrument. Obviously, the frets in equal temperament of the guitar caused some problems, but they were there to solve.

The problems were mainly solved by preparations of retuning, restringing and re-fretting the classical guitar. Partch took his first steps as an instrument builder in just intonation adapting traditional instruments. The first one was the Adapted Viola (1930) which was a viola with a cello's neck fitted on it. Next, he had adapted steel string guitars that I will discuss further in detail because they serve as a guidance for my own alterations of the classical guitar. Although I did not intend to rebuild the classical guitar in such a drastic way as Partch's steel string guitars, in the process of the research I came to the realization that I needed extra frets for the pitches from the 43-tone scales. The underlying idea for all preparations apart from being able to reach the tones, is also to imitate the timbre of Partch's instruments.

The two compositions for my arrangements date from Partch's beginning period as a so-called 'hobo composer'. The different periods of the composer's life and his works will be discussed in §2.1. These works demonstrate Partch's journey towards just intonation with his self-made instruments. I selected next works: *Two Studies on Ancient Greek Scales: 1. Olympos' Pentatonic 2. Archytas' Enharmonic* for the Harmonic Canon and Bass Marimba (1946) which became part of the cycle *Eleven Intrusions* (1946-1950) and are composed in modes (pentatonic, Phrygian, with tetrachords); and *The Letter - A Depression Message from a Hobo Friend* in its original version is for voice,<sup>6</sup> Kithara

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<sup>3</sup> All original instruments are preserved at The Harry Partch Institute at the University of Washington, Seattle, under direction of Charles Corey.

<sup>4</sup> Although he had also written for string quartet, and for the clarinet.

<sup>5</sup> I used the second edition throughout the research: Partch, Harry, *Genesis Of A Music: An Account Of A Creative Work, Its Roots, And Its Fulfillments*. Second Edition, Da Capo Press, Paperback, 544 p, 1979.

<sup>6</sup> The voice according to Partch does not have to adapt its intonation to the piano, but the piano needs to fit to the human speaking voice.

I and Adapted Guitar I. *The Letter* is an archetypical Partch composition because of its intonation and sound. Partch's theory of intonation from his magnum opus *Genesis of a Music* is then examined in §2.2 together with the different self-built instruments from the aforementioned compositions and the various notation systems. The process of arranging these two pieces for the classical guitar are discussed in Chapter 4 (*The Letter*) and 5 (*Two Studies*). Each of these chapters consist of a description and analysis of the original music and the specific notation of Partch's instruments on the music sheets (§4.1 and § 5.1). Next, the preparations in terms of tuning, re-fretting and objects attached to the strings, are explored (§4.2 and §5.2). Finally the original tablatures with the frequency ratios are set to a tablature that fits the classical guitar, but at the same time one that keeps reminding of Partch's alternative notation. At the end of Chapters 4 and 5, a summary is made of the points of attention for performance, regarding the techniques used and the interpretation on the classical guitar(s).

Very helpful to my research were the scholars treated in §3.2. Most of them perform(ed) Partch's repertoire in ensembles that are in the possession of the original instruments or replicas. They have often built the replicas themselves with or without the help of instrument builders. An important figure is John Schneider who has dedicated himself to building replicas such as the Adapted Guitar (I and II) and to performing Partch's repertoire solo or with his PARTCH ensemble (see §3.1.1). Others might rework Partch's music into arrangements, such as Ben Johnston (see §3.1.5) who had studied and recorded with Partch.<sup>7</sup> He had reworked *Barstow, Eleven Intrusions* with the *Two Studies on Ancient Greek Scales* for string quartet (1994). Next, contemporary composers and musicians like Chris Rainier and the Scordatura Ensemble (§3.1.2), Dean Drummond and the Newband Ensemble (§3.1.3), Charles Corey and the Harry Partch Ensemble (§3.1.4), are included as well. These musicians are quintessential for this research because they show the possibility for Partch's music and his unique instruments to travel beyond its museum walls and to tour around the world. §3.2 will be devoted to the classical guitar and its various preparations with objects, tuning, refretting and the playing techniques used during the twentieth and twenty-first century.

The research was done to found out whether or not an arrangement and performance of Partch's music can be made possible on a classical guitar and which specific alterations the classical guitar(s) would need.<sup>8</sup> In any case, this paper also tries to introduce any musician into Partch's music, starting off in the first part of the research with a description of Partch's life, his repertoire, theory, self-built instruments, and his entourage of musicians and ensembles during his life and after his death. The

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<sup>7</sup> Partch detested the idea of having pupils.

<sup>8</sup> I had started this research without having any certainties to whether his music could be played on one guitar, maybe a guitar duo, trio or quartet?

second part of the paper then focusses on the classical guitar and its modifications in order to play the compositions and finally my experience of performing the pieces. To conclude, the scores of the arrangements of *The Letter* and *Two Studies* are revealed in the Appendix.

## 2 Harry Partch

The reputation of Harry Partch often precedes his music. While scholars generally refer to Partch as ‘the hobo composer’<sup>9</sup> this alias does not capture his innovating composing praxis.<sup>10</sup> The so-called maverick that contradicted the Western societal and musical institutions of his time, was a determined craftsman who had designed a forty-three tone system for a new orchestra of self-built instruments.<sup>11</sup> He was also a philosophic music-man, who had elaborately studied exotic and ancient music cultures and music theories and then decided on his own music theory in the pioneering manifest *Genesis of a Music*. He was a theatrical man who looked for new expressions. At the end of his career he lead huge ensembles of musicians, actors and dancers for his later corporeal music plays.<sup>12</sup>

In short, Partch is an artist worth discovering and his music is worth listening and performing. However, it does not surprise that the cult around Partch has been rather small. Even most of the contemporary music world have been ignoring the composing praxis of the outlaw composer. Not mentioning the fact that the music is hardly performed at all, as John Schneider vouches:

I made the mistake of falling in love with Partch’s music, with no possible way of consummating my affection. There was nowhere to go to rent or buy the appropriate instruments, no teachers from whom to learn the scales, techniques & repertoire, nowhere to touch and feel the music except through the loudspeakers of my stereo [...] having sworn to learn it, [I] had to build my own harpsichord, teach myself the rules of notation, the keyboard technique to perform it and interpretational skills to bring it to life.<sup>13</sup>

Schneider calls his own research a “Regenesis of a Music” and says that who wants to get into his music or wants to “consume the love”, needs to fully dive into all sources that Partch has left behind: his complex music theory, the instruments, the scores and the recordings of his music.

Fortunately, there are keys to enter Partch’s secret musical realm.

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<sup>9</sup> ‘hobo’ is a term used during the Big Depression in the USA for the people living on the streets.

<sup>10</sup> Granade (2014).

<sup>11</sup> As Partch stated himself in his introduction of *Genesis of a Music*: “It also seems self-evident that if his [the composer’s] attitude is vigorous and individualistic, his practical requirements are not necessarily satisfied by the traditions he was born to; they may even require direct antitheses [...] Mine is a procedure more of antithesis than of simple modification, and the statement of this fact is essential as a groundwork for the pages that follow. Further, it is chronologically correct. The break came first, by intuition; the justification came second, by critical and historical analysis (Partch 3-4).”

<sup>12</sup> Partch opposed to the abstract music of symphonies because their composers, musicians, and conductors are solely .concerned with form, technique, and virtuosity (Partch 8-9; 49).

<sup>13</sup> Schneider (Regenesis: 2).

## 2.1 Life and Works

In this Chapter a description is given of Partch's life connected to his works as a composer, music theorist and instrument builder. The subchapters are ordered according to the different works he had accomplished: firstly the compositions he had written during his hobo years on adapted traditional instruments (§2.1.2), then, his research of *Genesis of a Music* and so he puts the theory into practice and starts building instruments and composing for these instruments (§2.1.3), followed by larger music-drama's at the end of his life and career (§2.1.4).

### 2.1.1 Musical Upbringing

Harry Partch was born in Oakland, California, at the very beginning of the 20th century. First, his family lived in Arizona, the 'Wild West' inhabited by tribes of Yaqui Indians.<sup>14</sup> In 1913 the Partch family moves towards the Mexican border, to Albuquerque. Partch grew up in this multicultural place and time. Furthermore, his eccentric parents had enlivened their home with Chinese culture. They had been missionaries in China, so at times they even spoke Mandarin to each other. Surely, his mother singing Chinese lullabies must have fueled the young Harry Partch's imagination and interest in oriental music.<sup>15</sup> In *Genesis of a Music* Partch sums up the music that had influenced him during his childhood and he includes: Christian hymns, the Chinese lullabies his mother sang, Yaqui Indian ritual, Congo puberty ritual, Cantonese music hall, and Okies singing in California vineyards.<sup>16</sup> At the same time, it had become harder to identify with the many Americans who "get together and then turn on the radio for their music."<sup>17</sup> This said, Bayley explains that Partch is nevertheless "quintessentially American" just because his music has "a solid grounding in American roots music: folks songs by whites, blacks and American Indians, work chants, popular tunes and jazz."<sup>18</sup>

Partch pursued his musical studies as an autodidact and taught himself many instruments such as the piano, guitar and clarinet. He had written a large amount of music during his youth, but in 1930 he burns all the scores, in all probability as a statement against equal temperament and its manipulative instrument, the piano.<sup>19</sup> The young wayward student drops out of the University of Southern California's school of music in 1922 – which he had attended since 1920 – and so he leaves behind equal temperament for good. Shortly after dropping out, he reads Hermann Von Helmholtz'

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<sup>14</sup> Johnston (1983: 228).

<sup>15</sup> Johnston (1983: 228) – Cott (2002: 280).

<sup>16</sup> Partch (1979: VIII).

<sup>17</sup> Lentjes, Rebecca, "Harry Partch's Bitter Music & Delusion of the Fury", accessed on: 30 october, 2018, <http://www.musicandliterature.org/reviews/2015/9/12/harry-partch>.

<sup>18</sup> Bayley, Lynn, Bayley, Lynn René, "More Wacky Music from Harry Partch", accessed on 20 september <https://artmusiclounge.wordpress.com/2019/05/15/more-wacky-music-from-harry-partch/>.

<sup>19</sup> Cott (2002: 280).

theory *On the Sensations of Tone* (1862/77) and also Helmholtz' translator A.J. Ellis's works on 19th-century experimental keyboards, and these works pave the way to just intonation.<sup>20</sup> encouraged by Helmholtz' theory during the years 1923-28, the period in which "his theoretical ideas were crystallizing", as Gilmore confirms, Partch, researches the harmonic series.<sup>21</sup>

The basis of his work is the intonation of the voice. According to the flections of the voice he starts adapting traditional instruments.<sup>22</sup> In 1925 he had already written a string quartet with fingerings in just intonation, but the first true just intonated work was in 1928 when he had added a fingerboard of a cello to a viola to be able to play twenty-nine tones in an octave; the viola was then played between the knees.<sup>23</sup> He used the adapted viola in *Seventeen Lyrics of Li Po* (1930/31) and started performing around the USA, first in San Francisco, then Los Angeles. He kept singing and accompanying himself on one instrument for sixteen years (1930-1947).<sup>24</sup>

Under a grant-in-aid from the Carnegie Corporation of New York Guggenheim Partch studied the history of intonation at the British Museum in London.<sup>25</sup> After a year of travelling around Dublin, Italy and Malta he returned to his home country that was in a deep economic crisis.<sup>26</sup>

#### 2.1.2 Hobo Years

From 1929 onwards the Great Depression was felt all over the country. When Partch returns in 1935 from Europe he chooses a life of roaming and 'trainhopping' cross-country as a hobo together with all other victims of the depression.<sup>27</sup> His compositions of the 1940s deal directly with the misfortunes of the hobos he met. Even though the life on the road was hard, Partch felt inspired and started to collect everyday speech of the various street personas. The hobos in the end became intrinsic to the music of this period and it gave him the famous title of 'the hobo composer'.

In this period his fascination for voice inflections reached its height.<sup>28</sup> He admitted that he had felt a true spontaneous human contact with the hobo's and something of this spontaneous human contact is felt in the compositions as well. Living on the streets brought the kind of freedom from (Western

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<sup>20</sup> Kassel, Richard, "Partch", accessed on: 15 october 2018 <https://vpn.ap.be/grovemusic/view/10.1093/gmo/9781561592630.001.0001/Danainfo=www.oxfordmusiconline.com+om-o-9781561592630-e-0000020967>.

<sup>21</sup> Gilmore (1995: 260).

<sup>22</sup> Schneider (Regenesis: 11).

<sup>23</sup> Schneider (Regenesis: 11).

<sup>24</sup> Partch (1979: 14).

<sup>25</sup> Gann, Kyle, "Keynote Address for the 2012 Harry Partch Conference in Boston", in: *blog*, Boston, 2012, accessed on 20 august 2019 <https://www.kylegann.com/PartchKeynote.html>.

<sup>26</sup> Partch (1979: 323).

<sup>27</sup> Bowes and Hall (2012).

<sup>28</sup> Mitchell, David & Jonathan Glasier, Accessed on 12 August 2019, <http://archive1999-2006.mendel.earth/deu/text/partch.htm>

music) society which allowed him to write, think and compose fully independently.<sup>29</sup> As Partch wrote in *Genesis of a Music*: “Having decided to follow my own intuitive path I began to write music on the basis of harmonized spoken words, for new instruments and in new scales, and to play it in various parts of the country.”<sup>30</sup> And further on:

Drawing on my experiences as a wanderer, I wrote music exploiting the speech of itinerants (*Bitter Music*), hitchhiker inscriptions copied from a highway railing (*Barstow*), a cross-country trip (*U.S. Highball*), and newsboy cries (*San Francisco*), generally using an ensemble of my own instruments. This autobiographical introduction [...] (will) provide a grasp of the conscious and unconscious fulfillments represented by movements and individuals. The examination of even a small part of the world’s music.<sup>31</sup>

In hindsight, these four prolific works are brought together in ‘a suite’ called *The Wayward* (1941-1955). The first of the cycle was *Barstow: Eight Hitchhiker Inscriptions from a Highway Railing at Barstow, California* (1941, revised 1968), followed by *US Highball: A Musical Account of a Transcontinental Hobo Trip* (1943, revised 1955), *San Francisco: A Setting of the Cries of Two Newsboys on a Foggy Night in the Twenties* (1943, revised 1955), and finally *The Letter: A Depression Message from a Hobo Friend* (1943, revised 1972). *The Wayward* brought him to the attention of the New York musical society.<sup>32</sup> A review writes: “His concert of these pieces for the League of Composers (April 22, 1944) established for him a small but permanent reputation as a musical maverick who had wandered off well-worn tracks and had developed a sort of lateral extension of his art, independently of any of the main circles of American music.”<sup>33</sup>

In *Genesis of a Music* he explains how he had always sought to do “dramatic work in music”, but nothing like opera.<sup>34</sup> *The Wayward* is an example of this dramatic work and not in the least of social critique. It is also “a piece of Americana”, as Johnston terms it, because the suite is composed in the style that American hobo’s talk on the streets.<sup>35</sup> Partch uses the fragments from real conversations on the road, as well as graffiti signs and hitchhiker inscriptions which then are “all recited, sung, intonated, and chanted against microtonal moans, instrumental imitations of railway noises, snatches of bar tunes, pentatonic shouts, and seventh- and ninth-chord guitar riffs.”<sup>36</sup>

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<sup>29</sup> Johnston (1983: 87).

<sup>30</sup> Partch (1979: 6).

<sup>31</sup> Partch (1979: 6).

<sup>32</sup> N.N., accessed on 2 september 2019 [http://www.newworldrecords.org/album.cgi?rm=view&album\\_id=80622](http://www.newworldrecords.org/album.cgi?rm=view&album_id=80622).

<sup>33</sup> N.N., accessed on 2 september 2019 [http://www.newworldrecords.org/album.cgi?rm=view&album\\_id=80622](http://www.newworldrecords.org/album.cgi?rm=view&album_id=80622).

<sup>34</sup> Partch (1979: 322).

<sup>35</sup> Johnston (2006: 91).

<sup>36</sup> Cott (2002: 217).

During the first year of his life on the road Partch had kept a personal diary.<sup>37</sup> The various texts from this diary are chronicled in *Bitter Music* (1969). It was then published posthumously. This edition also contains a rewriting of *The Letter*. It is true that Partch's Americana works centre the reality of the fallen figures of the country. But the focus lies on the musicality, not perforce the social situation of the people. As Partch suggests the emphasis lies on a world music in just intonation, guided by speech inflections.<sup>38</sup> He also started designing instruments or adapting traditional ones to fit to the voice. In fact, the instruments used in the first versions of these compositions are from a small collection of his instrumentarium built around 1943, namely: the Adapted Viola, Adapted Guitar, Chromelodeon, and the Kithara. The versions recorded later often have other instrumentation, and are mostly expanded to larger ensembles (see Chapter 4 and §4.1.1).

### 2.1.3 Genesis of a Music

In 1944 Partch had obtained residence at the University of Wisconsin and worked non-stop lecturing, performing and recording his music. He painstakingly began piling up his theoretical research *Genesis of a Music* (finished in 1947, published in 1949, and republished in 1974).<sup>39</sup> In 1949, the year of the publication of *Genesis of a Music* he moved to an isolated ranch in the primitive village Gualala, on California's north coast. The ranch had a studio in which Partch could further elaborate on his music and record independently.<sup>40</sup> It would become an application of Helmholtz to music.

In *Genesis of a Music* the composer shares all fundamental concepts of his composing praxis. He narrates his personal and scientific journey into just intonation and how he finally decides on a 43-tone scale. The chapters on his self-built instruments provide the reader with elaborate descriptions of the instruments or as John Schneider jokingly puts it: "It is [...] a Cookbook! When read closely, Partch's descriptions of his wonderful instruments include dimensions, materials and tunings... almost enough information to reproduce them exactly."<sup>41</sup> Furthermore, Partch's writing style is remarkable. He shows a big talent for writing, that Gann describes as follows: "[Partch] pounds away at his thesis with a macho forcefulness and yet can also pause to be gracious [...]"<sup>42</sup> Gann then emphasizes the scientific dimension of the theory: "What is always at stake is that *Genesis of a Music* relies on the assumption that music is a science. Inspired by ancient Greek as well as ancient

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<sup>37</sup> Partch (1979: 322).

<sup>38</sup> "He wrote a folk music that was assimilating traditions from all over the world." (Johnston 92).

<sup>39</sup> Partch, Harry, *Genesis of a Music*, New York: Da Capo Press Inc., 1974.

<sup>40</sup> Johnston (2006: 93).

<sup>41</sup> Schneider (Regenesis: 3).

<sup>42</sup> Gann, Kyle, "Keynote Address for the 2012 Harry Partch Conference in Boston ", In: *blog*, Boston, 2012, accessed on 20 august 2019 <https://www.kylegann.com/PartchKeynote.html>

Chinese philosophy."<sup>43</sup> Even though no one knows how the music sounded, there have derived some mathematic and musical theories from these ancient times. As a contraposition Partch discusses all European musical traditions from the Middle Ages to the avant-gardism's of the 20<sup>th</sup> Century that he criticizes.<sup>44</sup>

The important concepts of his composing praxis in *Genesis of a Music* will be discussed more in detail in §2.2.1

#### 2.1.4 Music-drama's

After the '50, Partch's determination as a composer and artist seemed to have grown. Different from the minimal dramatic settings of one voice and accompaniment in his earlier works, the music-dramas are for the whole orchestra of self-built instruments and stages many performers who at them same time dance, sing (intone), act and play the instruments. Partch also worked with different choreographers, actors, dancers, musicians and directors. Ben Johnston acknowledged that it is highly probable that Partch acted as "the sole creator of all the artistic components, like Orson Welles. Only he was not equipped to do that successfully", referring to the fact that Partch was quite difficult to work with.<sup>45</sup> Still, according to long-time Partch collaborator Danlee Mitchell, Partch was a romantic, furthermore, performing in his large ensembles was an amazing experience: "We [the performers] were the music—we were not the color, we were the actual music—so it was really a satisfying experience to be in those ensembles."<sup>46</sup>

Central is the physicality or 'Corporeality' of everything present on stage, as well as the music. The music is not to set the mood, but has a body, it is part of the story while the abstract music of symphonies is only mental or spiritual.<sup>i</sup> The expressiveness of the musician is crucial with Partch, yet he barely indicates dynamics such as crescendo's or fortes. Important is to search for natural ways to play an instrument, not to interpret the music as concert solo music in terms of contrasting dynamics and so on. Moreover, the visual appearance of the beautiful instruments, the movements of the performers, the sounds of the instruments and the voice are a oneness.<sup>47</sup> Partch means with Corporeality something "emotionally 'tactile'".<sup>48</sup> Schneider explains that according to Partch

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<sup>43</sup> Ekman (s.d.: 15).

<sup>44</sup> Johnston (2006: 92).

<sup>45</sup> Johnston (2006: 91).

<sup>46</sup> Johnson, Jake, "Two Studies on Harry Partch: Conversations with Danlee Mitchell and Betty Freeman", Accessed on 3 May 2019 <http://www.echo.ucla.edu/two-studies-harry-partch-conversations-danlee-mitchell-betty-freeman-jake-johnson/>

<sup>47</sup> Cott (2002: 282).

<sup>48</sup> Partch (1979: 8).

Corporeality is “as old as music itself; musicians do not get the point if they only care about playing the right notes.”<sup>49</sup> Or else: the musician must be acting as the *dramatis personae*, as part of the scene.<sup>50</sup> Furthermore, the musicians must be able to play all kind of Partch’s self-built instruments. Participating in his music-drama’s means to be flexible and to engage in the totality of the performance.

Johnston considers the music-drama’s a “visual theater” and so it is obsolete to experience them live.<sup>51</sup> The effect of only listening to recordings, though, is very interesting. Without the visual scene, there is a sensation of grotesqueness on part of the listener. The passionate engagement of the participants is nevertheless also felt on the recordings alone. As if one hears tribes in rituals, as Cott analyzes: “All of Partch’s later music-dramas are at once rituals of enormous emotional charge and allegories presenting the force of the unrepressed body and spirit in its progress through the abstract world.”<sup>52</sup>

The stories are all based on Eastern Noh-theatre and Greek tragedies.<sup>53</sup> Unfortunately, an analysis of the different musical drama’s fall beyond the scope of this research, nevertheless they will be mentioned briefly here: *Oedipus* (1952);<sup>54</sup> *The Bewitched* (1957); *Revelation in the Courthouse Park* (1960);<sup>55</sup> *Water! Water!* (1961); and finally, *Delusion of the Fury* (1963-69).

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<sup>49</sup> Schneider (Regenesis: 14).

<sup>50</sup> Ibid. (Regenesis: 14). A musician must be an actor, performer and dancer at the same time.

<sup>51</sup> Johnston (2006: 85).

<sup>52</sup> Cott (2002: 275).

<sup>53</sup> Noh-theatre is traditional Japanese drama. The Noh performers are storytellers more than they are actors. They tell stories while making movements with the body. The spectacle becomes more of a visual experience full of symbols and allusions to Japanese history. (N.N., accessed on 29 November 2019, <https://www.britannica.com/art/Noh-theatre>).

<sup>54</sup> Partch had visited Dublin before and had heard Yeats reciting poems. Yeats had shared the same philosophy with regards to words in music that approaches the natural speech. Later Partch would ask permission to use Yeats translation of Sophocles’ Oedipus. Unfortunately the permission never came, not because of Yeats himself, but because of his heirs. In the end Partch made his own translation of Sophocles’ drama, but it was not very succesful as Johnston asserts: “The texts of U. S. Highball are beautiful but Partch’s translation of Oedipus, leaning heavily on the expertise of a Bay-area Greek scholar and on Yeats’s translation, leaves much to be desired.”

<sup>55</sup> Partch was determined to make this adaptation of Euripides’ The Bacchae “an American here-and-now drama.”

## 2.2 Partch's Theory and Instruments

This chapter deals with the main concepts from Partch's music theory in *Genesis of a Music*. Further on in the Chapter, his self-built instruments are discussed, moreover the instruments from the compositions that I am arranging for classical guitar: the Adapted Guitar, the Kithara, the Bass Marimba, the Harmonic Canon and the Chromelodeon. The Chapter ends with an explanation on the role of the intoning voice in his music.

### 2.2.1 Concepts from Genesis of a Music

It would be impertinent to explain a complex music theory of 466 pages in only a short summarizing Chapter. Still, the important concepts from his work like just intonation and the harmonic series are illustrated here because they are crucial for an understanding of his music and instruments. Without this step Partch's music can never be understood, let alone arranged.

#### 2.2.1.1 Ratios and Just Intonation

According to Partch the only clear terms to describe the distance between tones is with numbers or frequency ratios.<sup>56</sup> Just intonation is in fact a mathematical division based on the harmonic series.<sup>57</sup> The harmonic series imply that any fundamental or root tone will produce multiplications (partials) of itself that result in pure intervals.<sup>58</sup> When dividing a string of the guitar by touching it lightly at the twelfth fret (octave) and then into smaller and smaller equal parts (fifth, third, etcetera..), the overtones heard produce a scale of partials in unequal divisions.<sup>59</sup> These are the just intervals that are unequal in distance but acoustically in tune.

The character of a tone is therefore decided by its relationship to the fundamental – so never by a single tone.<sup>60</sup> For example, the tone expressed by a  $3/2$  ratio ('a perfect fifth'), or a  $2/1$  ('an octave'), etcetera. is found by the frequency of  $1/1$ . If  $1/1$  is a G, as in Partch's scale,  $3/2$  is a D or 'a perfect fifth' above the fundamental.<sup>61</sup> Terms such as 'third' or 'octave' in fact are rejected in just intonation because they only describe the physical distances on the equal tempered keyboard.<sup>62</sup> Just intonation is also a system that is unlimited. Snyder asserts that: "the initial interval [...] is  $2/1$ , and stemming from this are the wealth of musical intervals inherent in small number tonal relationships [...] and

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<sup>56</sup> Ekman (s.d.: 15).

<sup>57</sup> Silverman, Accessed on 12 November 2019, <https://forum.makemusic.com/attach.aspx/6229/Partch.pdf>.

<sup>58</sup> Ekman (s.d.: 12).

<sup>59</sup> Schneider (2004: 1).

<sup>60</sup> Ekman (s.d.: 15).

<sup>61</sup> Snyder (2010: 5).

<sup>62</sup> Ekman (s.d.: 15).

could continue into infinity, producing a system with an unlimited number of pitches.”<sup>63</sup> Therefore just intonation is never a closed system.<sup>64</sup> Yet composers tend to use a limit of tones within the octave. In Partch’s case he chose the 11-limit (see further §2.2.1.2.).

#### 2.2.1.2 The Tonality Diamond and U/Otonalities

Schneider explains: “Just intonation matches the notes of a scale with the harmonics generated by the key of that scale.”<sup>65</sup> So Partch constructed his forty-three tone scale starting from this monophonic idea of a key or fundamental pitch 1/1 (G) and then derived the pitches from the harmonic series of this fundamental. In just intonation the possible amount of tonalities is infinite, as mentioned before. Partch had introduced the concept of the ‘limit’ to determine the maximum and the complexity of the ratios, which in his scale is an 11-limit, with eleven being the highest odd number of the ratio.<sup>66</sup> While in equal temperament the partials 7 and 11 do not exist,<sup>67</sup> Schneider asserts that: “Partch’s basic harmonic unit is the hexad based on the Roots 3<sup>th</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup> tuned to the 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup> harmonic of the Overtone series.”<sup>68</sup>

Partch then derived twenty-eight tonalities from the Identities 1-3-5-7-9-11.<sup>69</sup> The term ‘Identity’ is to describe what in tonality is heard as ‘major’ – which Partch calls an Oidentity or over number- and ‘minor’ -Uidentity, under number.<sup>70</sup> Comparing with equal temperament, Ekman clarifies this division as follows: “Partch used this pseudo-minor/major polarization even in ratios without the traditional major/minor defining numbers 5 or 3rd of a triad.”<sup>71</sup> Next, he organized the pitches in a tonality diamond that conveys the chordal relations within the ratios.<sup>72</sup> It is constructed according to O- and U-tonalities that form the diagonals of the diamond. O- and Utonality are also derived from the harmonic series, in which Utonality is indeed an inversion of Otonality. Basically, Otonality has in the numerator the highest odd number: in 7/5 the seven is the highest odd number. Vice-versa Utonality has the highest odd number in the denominator: for instance, 8/11 with 11 being the highest. Partch’s final tonality diamond was an 11-limit diamond. Partch explains that each line of six ratios in his diamond is:

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<sup>63</sup> Snyder (2010: 12).

<sup>64</sup> Ibid. (2010: 12).

<sup>65</sup> Schneider (2004: 1-2).

<sup>66</sup> Sknyder (2010: 16).

<sup>67</sup> Ekman (s.d.: 8).

<sup>68</sup> Schneider (Regenesis: 9).

<sup>69</sup> Partch (1979: 158).

<sup>70</sup> Ibid. (1979: 71).

<sup>71</sup> Ekman (s.d.: 11).

<sup>72</sup> Gilmore (1995: 262).

A representation of tonality ingredients and they hold the potentiality of the maximal consonance that can be achieved by the Identities 1-3-5-7-9-11. If the orthodox manner of building a chord in “thirds” is followed, the identities are in this order:1-5-3—7-9-11. The fact of tonality is the fact of maximal consonance for a stipulated number of different identities.<sup>73</sup>

Or as Ekman states: “the 11-limit is a hexachord; the five limit is a development of triads.”<sup>74</sup> While Partch was studying at the British Museum in London in 1934, he had observed a small pipe organ in the South Kensington Museum which according to the builder was to prove the downside of just intonation that it prevents even the simplest modulation.<sup>75</sup> The benefit of having twelve equally distanced tones in the ET is the possibility of modulation and that on all 12 degrees of the chromatic scale tempered major and minor triads can be built.<sup>76</sup> In just intonation instead “no multiple of an interval will go into another interval in such a way as to form a ‘cycle’”, because the distances between degrees are unequal to each other.<sup>77</sup> Partch obviously disapproved of “the traditional western practice of producing tension through chromaticism.”<sup>78</sup> Instead of using chromatism to create tension in music, Partch creates tension with dissonance of 7-limit and 11-limit ratios and chords for which generally: “[t]he smaller the number, the greater the consonance; the larger the number of the two numbers of the frequency ratio, the greater the dissonance [...]” This is furthermore confirmed by the harmonic series.<sup>79</sup>

Contradictory, Snyder claims that the music written in just intonation is most of the time harmonically static.<sup>80</sup> Also Gann observes that “tuning harmonies was a relatively minor concern in Partch's compositional thinking. So much of his music is percussion-based, so rarely did he sustain novel harmonies, so little time did he devote to the exotic chord progressions that his scale renders possible.”<sup>81</sup> When thinking of Partch’s music as ritual this fits about right – think of a drones and raga in Indian music and the repetitive percussion in many primitive musical cultures. Hypnotic rhythms are also featuring in Partch’s repetitive, but not tiresome compositions.<sup>82</sup> On the other hand, Partch chose the pure intervals of just intonation to break out from the limited harmony (I – IV – II -V - I) and moods in equal temperament. He goes as far as the 11-limit to find new dissonances in music, as

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<sup>73</sup> Partch (1979: 160).

<sup>74</sup> Ekman (s.d.: 13).

<sup>75</sup> Partch (1979: 190).

<sup>76</sup> Ekman (s.d.: 7).

<sup>77</sup> Partch (1979: 135).

<sup>78</sup> Ekman (s.d.: 8).

<sup>79</sup> Ibid. (s.d.: 8).

<sup>80</sup> Snyder (2010: 12).

<sup>81</sup> Gann, Kyle, “Keynote Address for the 2012 Harry Partch Conference in Boston”, accessed on 20 august 2019, <https://www.kylegann.com/PartchKeynote.html>.

<sup>82</sup> Partch (1991: 222-3).

seen in his final scale. In this scale all notes can be tonic, dominant, sub-dominant etcetera. Finally, his music remains most of the time quite tonal.

### 2.2.1.3 The Final Scale

I have been called the 43-tone man, which is (or I've called it), a half-truth, or a quarter-truth. I suppose it is, but actually, I have never set a number and said I'm going to stick to that number of tones because in an expanding tonal system one can't do that.<sup>83</sup>

Table 1 Partch's 43-tone scale

step	1	2	3	4	5	6	7	8	9	10
factor	1/1	12/11	11/10	10/9	9/8	8/7	7/6	6/5	11/9	5/4
step	11	12	13	14	15	16	17	18	19	20
factor	14/11	9/7	4/3	11/8	7/5	10/7	16/11	3/2	14/9	11/7
step	21	22	23	24	25	26	27	28	29	
factor	11/7	8/5	18/11	5/3	12/7	7/4	16/9	9/5	20/11	

Partch did not design this scale to set a new standard. Snyder remarks moreover that in just intonation “one may select pitches from this infinite fabric that serve the purposes of a particular body of work.”<sup>84</sup> Consequently, Partch had selected and ordered the tones into a mirror structure: from the center point there are familiar intervals also seen in western musical theory, but also unusual microtonal ones with the prime number 11.<sup>85</sup> The scale first showed some large gaps – for example between the ‘minor third’ 6/5 and the ‘septimal minor third’ 7/6 – and so to fill up these gaps, Partch rather intuitively picked extra ratios by multiplying two simple others and then finished his scale of 43 pitches.<sup>86</sup>

For an overview of the different 43-tones in frequency ratios with reference to standard tones in ET I regularly consulted the scheme that is presented in the form of a stairway.<sup>87</sup>

<sup>83</sup> Mitchell, David & Jonathan Glasier, “Harry Partch lectures, An edited transcription of a series of lectures given by Harry Partch between 1950 and 1970”, Accessed on 13 September 2019, <http://archive1999-2006.mendel.earth/deu/text/partch.htm>.

<sup>84</sup> Snyder (2010: 18).

<sup>85</sup> Snyder (2010: 14).

<sup>86</sup> Ibid. (2010: 14).

<sup>87</sup> Partch (1979: 134).



$\flat\flat$ $\flat$ $\natural$ $\sharp$ $\times$	<i>Pythagorean series of fifths – the open strings (... c g d a e ...)</i>
$\flat$ $\natural$ $\sharp$ $\times$	$\flat\flat$ $\flat$ $\natural$ $\sharp$
<i>lowers / raises by a syntonic comma 81 : 80 = circa 21.5 cents</i>	
$\flat$ $\natural$ $\sharp$ $\times$	$\flat\flat$ $\flat$ $\natural$ $\sharp$
<i>lowers / raises by two syntonic commas circa 43 cents</i>	
$\flat$	$\natural$
<i>lowers / raises by a septimal comma 64 : 63 = circa 27.3 cents</i>	
$\flat$	$\sharp$
<i>lowers / raises by two septimal commas circa 54.5 cents</i>	
$\sharp$	$\natural$
<i>raises / lowers by an 11-limit undecimal quarter-tone 33 : 32 = circa 53.3 cents</i>	
$\sharp$	$\sharp$
<i>lowers / raises by a 13-limit tridecimal third-tone 27 : 26 = circa 65.3 cents</i>	
$\natural$	$\natural$
<i>lowers / raises by a 17-limit schisma 256 : 255 = circa 6.8 cents</i>	
$\flat$	$\flat$
<i>raises / lowers by a 19-limit schisma 513 : 512 = circa 3.4 cents</i>	
$\sharp$	$\flat$
<i>raises / lowers by a 23-limit comma 736 : 729 = circa 16.5 cents</i>	

Figure 2 Helmholtz-Ellis Accidentals<sup>90</sup>

New instruments on the other hand may need new notations. Consequently, Partch's task as an instrument builder implied also to develop a new notation system for the self-built instruments. In earlier manuscripts he had proposed possible notation systems for his instruments.<sup>91</sup> In the end, he had for each individual instrument different tablatures.<sup>92</sup> Basically, he kept notating his music on staves, and even admitted that staves are convenient. The Adapted Guitar has a musical staff that shows the player which string to play.<sup>93</sup> For the remainder the notation is very visual. With only the musical scores, so without having access to the original instruments, the musician does not have a clue about the sound. Every new reader of Partch's scores is therefore presented with mysteries to unravel.<sup>94</sup> Schneider observes that Partch's scores look like pages of algebra.<sup>95</sup> Indeed, the tablature of the Adapted Guitar is as complex as lute tablatures during the renaissance.<sup>96</sup>

<sup>90</sup> Sabat (2005: 14).

<sup>91</sup> Snyder (2010: 18).

<sup>92</sup> Ibid. (2010: 18).

<sup>93</sup> Schneider (1985: 161).

<sup>94</sup> Silverman, "Preface", Accessed on 12 November 2019, <https://forum.makemusic.com/attach.aspx/6229/Partch.pdf>

<sup>95</sup> Schneider (Regenesis: 6).

<sup>96</sup> Schneider (1985: 96).

In my own arrangements I used the Partch-like approach of tablatures for each instrument describing the precise actions on the instrument.<sup>97</sup> The notation is purely visual without referring much to the standard twelve semi-tones from equal temperament. I could have chosen to write in twelve semi-tones that approximate given ratios adding accidentals, as Ben Johnston with extended just intervals in his own arrangements of Partch (see §3.1.6). Instead different tablatures that immediately translate the actions on the instruments prove very helpful for adapted traditional instruments like a classical guitar with a new organized fretboard (see Chapter 4 and 5).

### 2.2.2 Partch's Instrumentarium

After his studies in London Partch was determined to write significant music in just intonation.<sup>98</sup> He started to design the instruments that would fit the just intonated music he had in mind.<sup>99</sup> Partch stated in *Genesis of a Music* that "if I had an idea for an instrument, I also had an idea for music for that instrument."<sup>100</sup> At times an original instrument is adapted for one single composition. For example, he tunes extra reeds on the Chromelodeon for one specific work.<sup>101</sup> During his life Partch keeps altering the original instruments to fit new compositions so there is always a clear interaction between his instruments and his musical compositions. Besides, Partch does not include many different tones from the 43-tone-scale in his works. Ben Johnston remarks that "each of his instruments has a different finite selection of pitches from the potentially infinite tuning system he uses."<sup>102</sup> So when arranging Partch's music of a specific instrument one needs to know the range of tones of the instrument

The Partch instrumentarium is made up of twenty-six instruments all of which mostly built in California: Chromelodeon I (1945), Chromelodeon II (1950, retuning in 1959), Adapted Viola (1928), Adapted Guitar I (1934), Adapted Guitar II (1945), Kithara I (1938, new in 1972), Kithara II (1954), Surrogate Kithara (1953, for the work *Petals* two new canons are added in 1966), Bloboy (1958), New Harmonic Canon I (1945, new in 1972), Harmonica Canon II Castor and Pollux (1953, new pexiglas base in 1959), Harmonic Canon III Blue Rainbow, Koto (1966), Chrycord (1959-60), Diamond Marimba (1946), Quadrangularis Reversum (1965), Bass Marimba (1949-50), Marimba Eroica (1951), Bamboo Marimba I Boo I (1955), Bamboo Marimba II Boo II (1971), Cloud-Chamber Bowls (1950), Spoils of War (1950), Mazda Marimba (1963), Zymo-Xyl (1963), Gourd Tree & Cone Gongs (1964) and

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<sup>97</sup> Except the *Study on Olympos' Pentatonic* is kept in standard western notation.

<sup>98</sup> Schneider (Regensis: 3).

<sup>99</sup> Partch (1979: 194).

<sup>100</sup> Mitchell, David & Jonathan Glasier, "Harry Partch lectures, An edited transcription of a series of lectures given by Harry Partch between 1950 and 1970", Accessed on 15 August 2019, <http://archive1999-2006.mendel.earth/deu/text/partch.htm>.

<sup>101</sup> Mitchell, David & Jonathan Glasier (Ibid.)

<sup>102</sup> Johnston (2006: 43).

the Eucal Blossom (1964).<sup>103</sup> Partch had found the inspiration for all of his instruments in ancient tradition (Chinese and Greek); they are more than often percussive; and are not suitable for playing complex concert music but are intended for ritual music. Besides they are always decorated very beautifully and on stage they are very nice to look. On the recordings of *The World of Harry Partch* (1969) Partch himself gives details about each specific instrument he had built.

For the sake of this research the focus lies on the Adapted Guitars.

#### 2.2.2.1 Partch' Adapted Guitars

In 1934 he began adapting a second-hand Koa-wood *Martin* parlour guitar (#36860) from 1927. after gradual alterations the first version of the Adapted Guitar with frets in just intonation was completed.<sup>104</sup> Partch had changed the low, wire-type frets into high stainless-steel frets and had screwed them into slots in brass plate onto the neck."<sup>105</sup> He had restrung the guitar into following scordatura of three justly tuned 2/1 (octave)-pairs:

Table 2 Original Tuning of the Adapted Guitar I

[low]	E <sub>b</sub>	8/5
	E <sub>b</sub>	16/5
	G	1/1
	G	2/1
	B	5/4
[high]	B	10/4

This is a just tuned augmented chord. The third string is still a G (1/1) like in regular guitars and the B-string is tuned a just major third above (5/4) as is the D-string retuned to a E<sub>b</sub> (8/5).<sup>106</sup> The playing technique of the Adapted Guitar reminds of a mandolin tremolo with pick.<sup>107</sup> Also because Partch had narrowed the fingerboard by 1/4th on each side to even make it physically resemble the

<sup>103</sup> Partch (1979: 488).

<sup>104</sup> Schneider (1985: 161).

<sup>105</sup> Partch (1979: 203).

<sup>106</sup> Schneider (Regenesis: 6).

<sup>107</sup> Ibid. (Regenesis: 3).

mandolin. Furthermore, there is a large gap in the middle of the neck because he used this guitar to perform *Barstow* and so only needed the tones from this piece, for “[w]ith so many notes to choose from, cutting down the field lessens the chance of error and when other pieces demanded other notes, frets were simply added or taken away”, as Schneider asserts.<sup>108</sup> This guitar was generally used to compose and perform all his Americana works.



Figure 3 Partch's Adapted Guitar in 1943, in Ithaca, New York. Photograph courtesy of the Harry Partch Archives, University of Illinois at Urbana-Champaign.

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Partch adapted another guitar in 1945. He altered it with a smooth and narrow fingerboard and filled the slots. In the same year he replaced this guitar with a fretless electrified archtop guitar “with pinheads and brass rivets delineating an even greater number of microtonal pitches.”<sup>109</sup> This new Adapted Guitar I was without octave-pairs and so Partch had only three strings on them: Eb/G/B. Partch used this guitar to perform the second version of *The Letter* in 1950. Interestingly, Schneider claims that Partch would be the first composer in musical history to integrate an electric guitar (his Adapted Guitar II) in concert music.<sup>110</sup> Ultimately, this three-stringed guitar got lost and so the name Adapted Guitar I was used only to refer to the one with six strings or three octave pairs. Then, Adapted Guitar II was constructed.

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<sup>108</sup> Schneider (Regenesis: 6).

<sup>109</sup> Rainier, Chris, *Partch's Guitars*, accessed on 20 September 2019, [http://www.chrisrainier.net/p/home\\_28.html](http://www.chrisrainier.net/p/home_28.html).

<sup>110</sup> Schneider (Regenesis: 2).



Figure 4 Adapted Guitar II (left) and the electric Adapted Guitar I (right), 1945. Photograph courtesy of the University of Wisconsin Archives.

Consequently, we distinguish three different guitars: the Adapted guitar I (with six strings, acoustically, played with a slide); the Adapted Guitar II (with ten strings – six guitar tuners and four mandolin tuners- a brass -later Pyrex- rod, electronic amplification, played with a slide and in Hawaiian-style).<sup>111</sup> This Adapted Guitar II was a 1940's Hawaiian guitar of Oahu squareneck model that Partch had adapted in 1945-46.<sup>112</sup> Adapted Guitar II was used in many masterworks such as *King Oedipus* (1951), *Eleven Intrusions* (1940/1950). Still, Rainier has proved there is an Adapted Guitar III as well, that basically is Adapted Guitar I again, but transformed into a fretless lap steel strings with colors painted on the fingerboard and all strings tuned into G (unisons or octaves).<sup>113</sup> This guitar is used in the *Dreamer that Remains* (1972) a film for which occasion Partch had arranged *The Letter* for a larger ensemble<sup>114</sup> and so the guitar used in this version is the Adapted Guitar III.<sup>115</sup>

<sup>111</sup> Rainier, Chris, *Partch's Guitars*, accessed on 20 september 2019, [http://www.chrisrainier.net/p/home\\_28.html](http://www.chrisrainier.net/p/home_28.html).

<sup>112</sup> Ibid., accessed on 20 september 2019, [http://www.chrisrainier.net/p/home\\_28.html](http://www.chrisrainier.net/p/home_28.html).

<sup>113</sup> Ibid., *Partch's Guitars*, accessed on 20 September 2019, [http://www.chrisrainier.net/p/home\\_28.html](http://www.chrisrainier.net/p/home_28.html).

<sup>114</sup> For Schott's publication, see Chapter 5 that discusses the different versions.

<sup>115</sup> Personal E-mail communication Chris Rainier 7 April 2019.

#### 2.2.2.2 Other Partch Instruments

The instruments discussed in this paragraph are from the compositions I arranged for the guitar. In successive order they are: the Kithara, the Harmonic Canon, the Bass Marimba and the Chromelodeon. Although the Chromelodeon is not used physically in the pieces it is included because the voice notation in *The Letter* is with a keyboard layout for Chromelodeon I that guides the vocal intonation.

##### 2.2.2.2.1 The Kithara

Partch had built his first Kithara in 1938 in a woodshop in Los Angeles. The model was based on the ancient Greek Kithara as depicted on the beautifully decorated vases.<sup>116</sup> In ancient Greek theatre the kithara (or aulos) accompanies note per note the recitative in the dialogue to enhance the drama.<sup>117</sup> The Kithara from 1938 will go through many alterations in time: Carmel (1941), then Ithaca (1943), Madison (1945) and finally at Urbana (1959).<sup>118</sup> In the second edition of *Genesis of a Music* Partch refers only to the last version (1959) when mentioning (New) Kithara I. It is important to keep in mind that in all compositions between 1938-1954 the kithara I has a different tuning than the 'alto kithara' or New Kithara I after 1954. He then again retuned the New Kithara I for the last version of *The Letter* (1972). That is why when he writes in *The Letter* (1972) hexads 3 and 5, they coincide with hexad 1 and 6 from the first version (1943). More about this in Chapter 5.<sup>119</sup>

In *Genesis of a Music* Partch describes his "behemoth of a harp"<sup>120</sup> and its 72 strings grouped into twelve distinct series of six strings. Some of these hexads represent the 1-3-5-7-9-11 Identities, but they do not ever appear in that order.<sup>121</sup> The strings are from a guitar or tenor guitar. Johnston calls the playing technique of the Kithara "three dimensional"<sup>122</sup> as the performer needs to take into account the "parallel banks of strings tuned in alternating otonality and utonality hexachords; so because of reaching in and out to gain access to various 'tonalities'".<sup>123</sup> The Kithara player can create sliding sounds by moving the Pyrex glass tubes or rods between the strings and soundboards.<sup>124</sup>

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<sup>116</sup> Partch (1979: 220).

<sup>117</sup> Ibid. (1979: 9).

<sup>118</sup> Ibid. (1979: 488).

<sup>119</sup> Personal e-mail communication Chris Rainier 7 April 2019.

<sup>120</sup> Partch.la. *Alison Bjorkedal - Kithara, Surrogate Kithara, Harmonic Canons, Voice*. accessed on 10 Oktober 2019 <http://www.partch.la/partch-member-spotlight/14288046/v1i6>.

<sup>121</sup> Partch (1979: 220).

<sup>122</sup> "Many of [his instruments] call for a three-dimensional performing technique, as contrasted with the predominantly two-dimensional techniques of most common instruments. This is not a new idea. It is a basic feature of percussion technique when a mixed set of instruments is used. But Partch designed such setups into his instruments (Johnston 95)."

<sup>123</sup> Johnston (2006: 96).

<sup>124</sup> Partch (1979: 220).

[ KITHARA I  
 (old tuning, 1943-1953/54?) \* ] \* restring/re-tuned 1952?

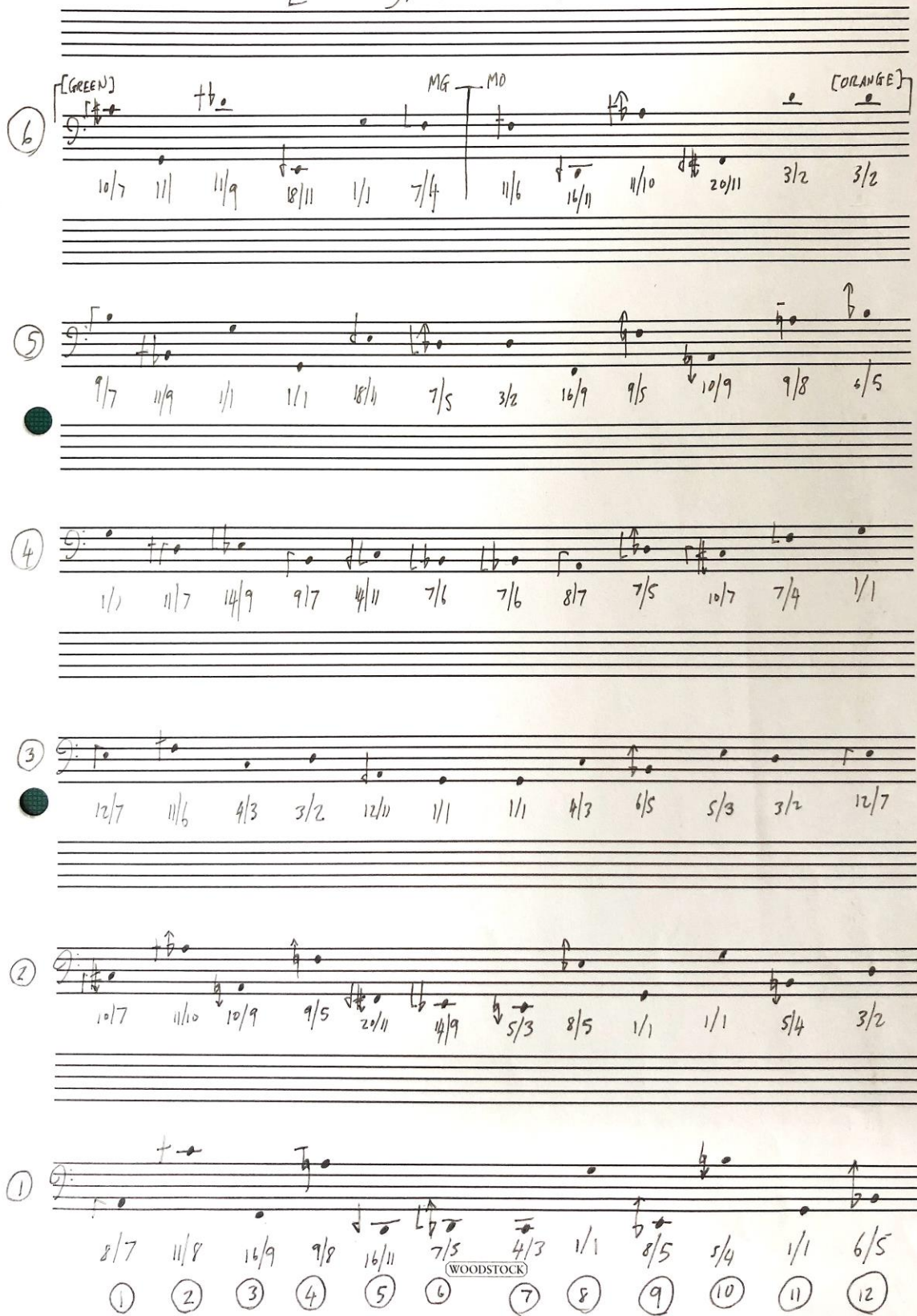


Figure 5 Tuning Chart Kithara I of the twelve hexads

The ratios at the bottom of the page are the ones closest to the player, even though some hexads ascend in pitch away from the player, and some descend away from the player.

There is also a surrogate Kithara built at Saussalito in 1953. A surrogate Kithara of 1966 has two new canons (tuning for *Petals* and *Delusion*). Finally, in 1972 another New Kithara I got built.



Figure 6 Kithara I, Wisconsin 1946, playing side

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#### 2.2.2.2.2 Bass Marimba

Partch has built a great deal of percussive instruments of which various marimbas. A bass marimba was built at Gualala in 1949-50 and rebuilt in 1951 with eleven vertical Sitka-spruce blocks.<sup>125</sup> This marimba only has a minimal selection of pitches because they occur in a loop.<sup>126</sup> On right-to-left diagonals the pitches are otonalities. On left-to-right diagonals the pitches are utonalities. The musician needs to stand on a riser because the top of the bars of this large marimba are one and a half meter above the floor. The marimba is played with large, diagonal movements and with four different types of mallets and the finger tops as well.<sup>127</sup> The hands of these musicians have to move in “lightning speed” for the many arpeggio’s and glissandos on the blocks.<sup>128</sup>

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<sup>125</sup> Partch (1979: 274).

<sup>126</sup> Ibid. (1979: 272).

<sup>127</sup> Johnston (2006: 95).

<sup>128</sup> Partch (1979: 229).



Figure 7 Bass Marimba (1951), © Charles Corey All Rights Reserved photo by Steven Severinghaus

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#### 2.2.2.2.3 Harmonic Canon

The Harmonic Canon I has forty-four monochords and was built in 1945 at the University of Wisconsin. Partch calls the harmonic idea of this instrument “a glorified multiple monochord.”<sup>129</sup> The strings are played with a pick held as flat as possible against the strings.<sup>130</sup> There are moveable bridges that are placed differently for each piece. The Harmonic Canon II (1953) was constructed for the composition *Castor and Pollux* and has two boxes, or canons, with each containing forty-four strings: the left is called Castor (its strings are guitar seconds and guitar fifths), the right is Pollux (its strings are guitar seconds).<sup>131</sup> The Harmonic Canon II uses a thick redwood base from the Harmonic Canon I combined with a new Pleiglass base and it has its bridges beneath the strings.<sup>132</sup> The settings of the bridges of the Harmonic Canon II are also those of the *Two Studies on Ancient Greek Scales: 1. Study on Olympos’ Pentatonic; and 2. Study on Archytas’ Enharmonic*.<sup>133</sup> The outline of these bridges will be discussed in Chapter 5 for the arrangement of the *Two Studies*. The Harmonic Canon I got reconstructed between 1953-1959.<sup>134</sup> The Harmonic Canon III was named the Blue Rainbow and was built at Venice 1965. It was intended for a standing player that could enhance percussive techniques on the canons.<sup>135</sup> The final New Harmonic Canon I then was built in 1971.

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<sup>129</sup> Ibid. (1979: 244).

<sup>130</sup> Ibid. (1979: 241).

<sup>131</sup> Ibid. (1979: 242).

<sup>132</sup> Ibid. (1979: 244).

<sup>133</sup> Ibid. (1979: 244).

<sup>134</sup> Partch (1979: 235).

<sup>135</sup> Ibid. (1979: 226).



Figure 8 The New Harmonic Canon I (1972) © Charles Corey All Rights Reserved, photo by Steven Severinghaus

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Figure 9 The Harmonic Canon II Castor and Pollux (1953) © Charles Corey All Rights Reserved, photo by © Steven Severinghaus

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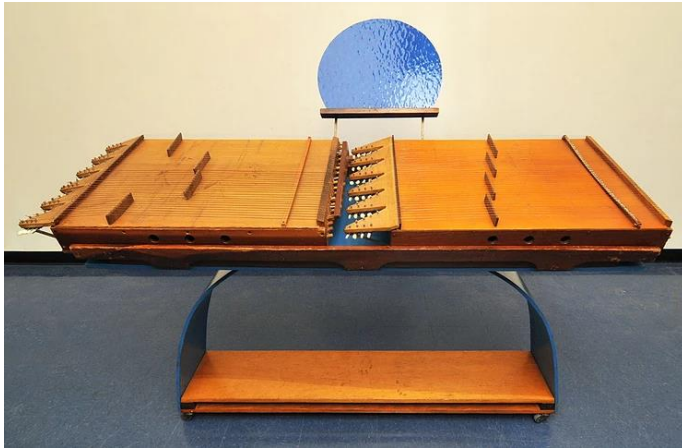


Figure 10 The Harmonic Canon III Blue Rainbow (1965) © Charles Corey All Rights Reserved, photo by © Steven Severinghaus

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#### 2.2.2.2.4 Chromelodeon

From the early 1930s Partch constructed several forty-four-notes reed organs.<sup>136</sup> Johnston explains that Partch's Chromelodeons have the usual 7-white and 5-black keys per octave, arranged in six octaves, but retuned in stepped microtonal pitches from low to high.<sup>137</sup> The Ptolemy (1934-35) was a reed organ Partch had built in London and had shipped to Santa Barbara where it was abandoned and lost.<sup>138</sup> In 1942 he retunes and adapts old-fashioned five-octave reed organs.<sup>139</sup> His first Chromelodeon also used the reeds from the Ptolemy and has forty-four keys. The Chromelodeon I has an additional keyboard called the sub-bass.<sup>140</sup> The Chromelodeon II has eighty-eight keys. This was Partch's 43-notes to the octave microtonal organ.

Modern synthesizers can have a chromelodeon set-up of the keys.<sup>141</sup>

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<sup>136</sup> Davies, Hugh, "Microtonal Instruments", accessed on 12 august 2019 ,<https://vpn.ap.be/grovemusic/view/10.1093/gmo/9781561592630.001.0001/,DanaInfo=www.oxfordmusiconline.com,SSL+omo-9781561592630-e-0000047628#0000047628.4.1>.

<sup>137</sup> Johnston (2006: 96).

<sup>138</sup> Partch (1979: 489).

<sup>139</sup> Ibid. (1979: 207).

<sup>140</sup> Corey, Charles, *His Instruments*. accessed on 14 October 2019 <https://www.harrypartch.com/instruments>.

<sup>141</sup> See: <https://hpi.zentral.zone/tbx2>, as an example.



Figure 11 Chromelodeon I © Charles Corey All Rights Reserved, photo by Steven Severinghaus

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Figure 12 Chromelodeon keyboard with ratios written on, Harry Partch Institute-6.jpg

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Even though the voice's notation seems in standard Western pitches on the scores, they are not. Instead the vocal parts are written in Chromelodeon notation. Therefore if one encounters a middle C in the written vocal part this is not necessarily a standard C because the key lay-out on the Chromelodeon indicates a totally different ratio (see Figure 12 and 13).

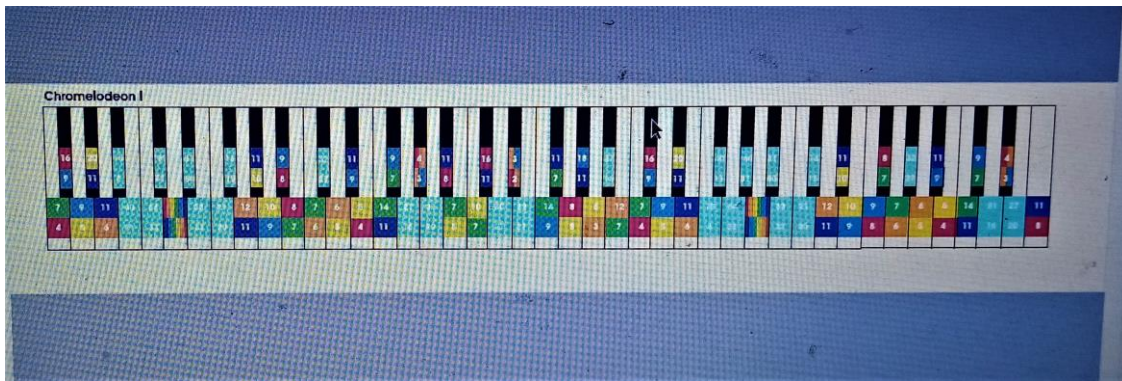


Figure 13 Klaviatur Chromelodeon I with the Ratios of each Key

### 2.2.3 Intonation of the Voice

Partch thinks of the voice as “the juice of a given identity [...] in the tonal world”<sup>142</sup>. The inflections of the voice were used as the base for his scale in just intonation, as he explains: “the spoken word was the distinctive expression my constitutional make-up was best fitted for, and [...] I needed other scales and other instruments.”<sup>143</sup> After all, speech inflections use smaller intervals than a semitone. Partch shies away from the embellishments of opera voices that overpower the meaning of the words.<sup>144</sup> Also, during the heydays of opera the voice entirely adapted to the tones of the tempered piano keyboard and so had lost its natural glides. Instead, Partch again looked at the ancient Greeks who were very fond of the reciting voice in theatre accompanied by music.<sup>145</sup> Gann illustrates that Partch had composed the syllable directly to a musical rhythm as the Greeks had done, but instead of writing poetry or monologues like a Greek poet he chose “the irregular rhythms of free verse and prose, [using] ‘found’ texts and other ‘nonpoetic’ materials”.<sup>146</sup> For example his recordings of the speech of hobo’s that he reproduced in *US Highball*, or the letter by hobo Pablo he had used in his composition *The Letter*. In his compositions the voice is intoning, instead of singing, maintaining so “the range and speed of the natural speaking voice.”<sup>147</sup>

<sup>142</sup> Partch (1979: 7).

<sup>143</sup> Ibid. (1979: VI).

<sup>144</sup> Ibid. (1979: 23).

<sup>145</sup> “Music [to the ancient Greeks], [...] was so essential, [...], and perhaps we will never know the full impact of its use in their drama (1979: 340).”

<sup>146</sup> Gann, “Keynote Address for the 2012 Harry Partch Conference in Boston”, accessed on 20 august 2019

<https://www.kylegann.com/PartchKeynote.html>

<sup>147</sup> Partch (1979: 7).

Beside the Greek culture another culture from the past is important to his theory of the voice, namely ancient Chinese culture.<sup>148</sup> In the first composition that centers the voice, *Seventeen Lyrics by Li Po* (1930-1933) Partch intones the lyrics by the eighth-century Chinese poet Li Po<sup>149</sup> and accompanies himself on the Adapted Viola.<sup>150</sup> He regarded the combination of one voice and the accompaniment by one instrument as vital because in this minimal setting the words could be clearly understood.<sup>151</sup> Gann asserts that Partch's attention to words in music was part of his larger belief in corporeality so that also on his big music-theatre-ensembles the meaning of the word maintain.<sup>152</sup>

But how can Partch write music for an intoning voice? In *Genesis of a Music* he explains the process as follows:

I learned that the voice is extraordinarily susceptible to alteration provided that the ear hears.<sup>153</sup>

Next, I wrote voice parts in Chromelodeon notation so that in rehearsal the chromelodeonist could aid in obtaining precise tones. Here the voice scores are in the usual notation, with the usual pitch values (as close as these can be figured to the actual ratios); and these scores are then used simply as guides to movement, or direction, very much as neumes were used in the days of plainsong. A third voice notation, used very briefly, employed the color analogy.<sup>154</sup>

To understand the notation of the voice there always must be a Chromelodeon key lay-out for the right ratios.

Again, Partch talks about 'intoning' instead of 'singing' because tones that imitate daily spoken English. His 'words-as-music approach' had also found its way to alternative pop culture, with examples of Tom waits and Frank Zappa.<sup>155</sup> Patrick Humphries explains that Waits' album *Swordfishtrombones* is under Harry's spell and Waits himself remarks on the relationship of him and Partch that he also uses "the things we hear around us all the time" and that he also "built and found instruments."<sup>156</sup> Or Zappa – and Partch was interested in Zappa's music – even attended the rehearsals at UCLA of *Delusion of the Fury* out of curiosity.<sup>157</sup>

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<sup>148</sup> Partch (1979: 8).

<sup>149</sup> Translated by Shigeyoshi Obata.

<sup>150</sup> Partch (1979: 6).

<sup>151</sup> Ibid. (1979: 9).

<sup>152</sup> Gann, "Keynote Address for the 2012 Harry Partch Conference in Boston ", In: *blog*, Boston, 2012, accessed on 20 august 2019 <https://www.kylegann.com/PartchKeynote.html>

<sup>153</sup> Partch (1979: 255).

<sup>154</sup> Ibid. (1979: 256).

<sup>155</sup> Chusid (2000: 90-91).

<sup>156</sup> Ibid. (2000: 91).

<sup>157</sup> Ibid. (2000: 91).

### 3 Arranging Partch for Guitar

This first part discusses the musicians in the past and present who have performed or have studied Partch's music. This includes figures like Ben Johnston and John Schneider, and the ensembles specialized in Partch's repertoire, like *PARTCH* ensemble and *Scordatura*. Certainly, there might be – and hopefully are – more contemporary musicians and composers who are performing his music. Slowly but surely some composers that are interested in Partch's instruments in just intonation, are re-creating his otherworldly atmosphere in their own compositions, such as Charles Corey and Chris Rainier who have written new compositions for Partch's instruments. An important question to answer is whether these musicians play on copies or adaptations of the instruments,<sup>158</sup> or even classical, but prepared instruments.

§3.2 then will illustrate the preparations and techniques on the guitar during the twentieth and twenty-first century with the purpose of creating different textures and timbres. These preparations give ideas on how might to approach the specific timbre of Partch's instruments. Finally, the tuning of the guitar and the re-fretting for just intonation is a crucial aspect for Partch's compositions and theory and is discussed at the end of the section.

#### 3.1 Inspiration from Contemporaries

For my paper I drew inspiration from other musicians that were performing Partch. Apart from personal communication with some of the musicians that play Partch's music on original instruments, also reading their articles fueled my knowledge of Partch's sound world. Therefore the most important musicians (with regards to my paper) and their activities are summed up in this first paragraph.

##### 3.1.1 PARTCH Ensemble

The acclaimed ensemble PARTCH is specialized in performing Partch's repertoire. They are based in Los Angeles, USA. Here, musicians and instrument builders work together to make replicas of the original instruments so that the music can be played on the proper instruments. When founded in 1991, the ensemble was called 'Just Strings' and they played a varied repertoire of Lou Harrison,

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<sup>158</sup> Alterations of an instrument of Partch happen for different reasons depending for each instrument, but an important aspect is the easiness of playing when executing Partch's compositions. Always one needs to take into account that Partch meant his music to be very performable for his musicians, opposing the technical standards in western classical music. For example when Chris Rainier adds extra frets on his Adapted Guitar I replica, it is because he wants to play more pieces of Partch on the Adapted Guitar and the original Adapted Guitar I has only a few frets and featured only in a few pieces of Partch (Personal e-mail communication with Chris Rainier, 25/08/2019).

Partch and also premiered modern works by contemporaries. When their twelfth Partch instrument for the ensemble was finished in 2005 the ensemble was renamed PARTCH.<sup>159</sup>

They have received many praise for their concerts and recordings. The recording of *Bitter Music* was even nominated by a Grammy Award nominated in 2012 and in 2014 they were awarded Best Chamber Music Performance.

#### 3.1.1.1 John Schneider

Schneider is a specialist of contemporary and microtonal (guitar) music and of the music of Partch. He has also written extensively on these subjects. His research *The Contemporary Guitar* (1985) is an important source for guitarists that are interested in the contemporary repertoire and techniques. As a musician he performs regularly around the world, solo as well as with the PARTCH ensemble. Finally, he is responsible for many copies of Partch's instruments. His main goal is to keep Partch's music alive.

Schneider has done important recordings of Partch's music for voice and solo accompaniment. On *Just Guitars*<sup>160</sup> Schneider performs *Barstow: 8 Hitchhikers' Inscriptions* (1941), Partch's long lost song cycle, *December 1942*, that begins with *Come Away Death* from Shakespeare's Twelfth Night, and finally *Three Intrusions* (1949). In these works Schneider is intoning the vocal parts and playing on his own copies of Partch's Adapted Guitar The same goes for his recording *Harry Partch: Bitter Music* which was grammy nominated.<sup>161</sup> Needless to say that these recordings are much of interest for the arrangements for solo classical guitar(s) and voice.

Schneider rebuilt the three Adapted Guitars of Partch (see 2.2.2.1).<sup>162</sup> In 1992 he first rebuilt the Adapted Guitar I (1935) together with Greg Brendt, in 2000 the Adapted Guitar II (1945) again with Greg Brendt, in 2006 he made a replica of the Adapted Guitar III (1950) by himself:

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<sup>159</sup> See official site: <http://www.partch.la/home>.

<sup>160</sup> Schneider, John, *Just Guitars*, cd with Rebekah Raff, Gene Sterling, Bridge records 9132, Inc. 200 Clinton Avenue, New Rochelle NY ©2003.

<sup>161</sup> Partch, Harry, *Harry Partch: Bitter Music*, cd with John Schneider, Bridge Records 9349 A/B/C, ©2011. Grammy nomination for "Best Classical Compendium".

<sup>162</sup> Schneider (Regenesis: 7).

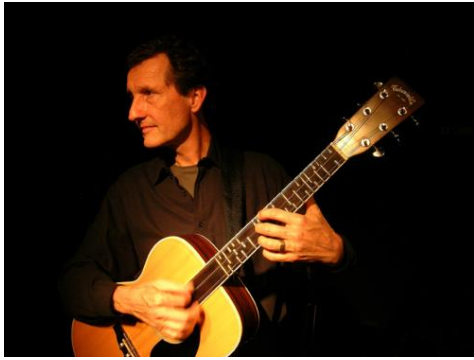


Figure 14 Replica of the Adapted Guitar I, adapted by Greg Brandt & John Schneider (1992)

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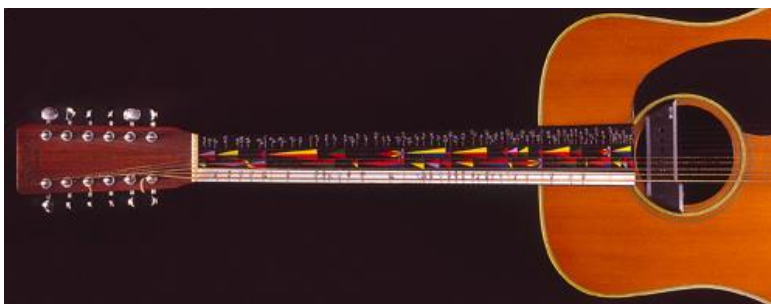


Figure 15 Replica of the Adapted Guitar II, adapted by Greg Brandt & John Schneider (2000)

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Figure 16 Schneider's replica of the Adapted Guitar III, adapted by John Schneider (2005)

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For the PARTCH ensemble he had worked together with instrument builders on copies of Partch's instrumentarium, such as: the Adapted Viola (1930) adapted in 2003 with the help of Robert Portillo and was nicknamed "Jabberwocky";<sup>163</sup> the Diamond Marimba (1946) he worked on with Skip

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<sup>163</sup> Could refer to the nonsensical poem *Jabberwocky* by Lewis Carroll from the book *Through the Looking Glass* (1871).

Abelson, Richard Cooke and Bill Slye in 2001; the Bass Marimba (1950) again with Skip Abelson and Bill Slye in 2003; the Cloud Chamber Bowls (1950) copied together by Skip Abelson in 2005; the Chromelodeon (1941) in 2009 with Kent Arnold; Marimba Eroica (1951) with Chris Banta in 2013; the Boo (1955) again with Banta in 2017.

In terms of instruments, it appears that John Schneider and his ensemble are loyal to the original orchestrations of Partch, as they build exact copies or certain adaptations (Adapted Guitar and Adapted Viola).

#### 3.1.1.2 Other PARTCH Musicians

Important musicians joining are Erin Barnes (diamond marimba, eroica and cymbal); T.J.Troy (bass marimba); Shirley Hunt (adapted viola); Derek Stein (cello); Nick Terry (percussionist, cloud chamber bowls, marimba eroica, bass marimba); Alex Wand (guitar, surrogate kithara, voice, harmonic canon); Matt Cook (HypoBass, Woodblock, Marimbas); Vicky Ray (chromelodeon, kithara, harmonic canon) Alison Bjorkedal (kithara, surrogate kithara, harmonic canons, voice).

David Johnson is an ex-member of the ensemble PARTCH. He had joined the group from the beginning 1991 until 2016, he had provided a rehearsal venue and storage for the band's instruments from 2006 to 2018.<sup>164</sup> In 1970 he met Dean Drummond, also a percussionist who was studying with composer Harry Partch.

#### 3.1.2 Scordatura Ensemble

On the European continent the Amsterdam-based Scordatura ensemble (since 2006) is specialized in just intonated tuning systems. Their idea of playing microtonal is to expand "the harmonic vocabulary of music."<sup>165</sup> An important project was The Amsterdam Partch Project *Rose Petal Jam* which was a concert tour of Partch's early chamber music. The musicians furthermore performed the work of Partch for Adapted Viola, Chromelodeon and voice. An exact copy of Partch's Adapted Viola was used. From then on, the ensemble kept adding and building new replicas of Partch's instruments. Their mission is to deepen their knowledge of the Partch heritage and to share his music. The ensemble also invests in research and education projects.

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<sup>164</sup> Partch.la. *David Johnson - Member Emeritus*. Accessed on 10 oktober 2019 <http://www.partch.la/partch-member-spotlight/14284609/v1i1>.

<sup>165</sup> Scordatura. *THE AMSTERDAM PARTCH PROJECT*, accessed on 17 oktober 2019 <https://trioscordatura.wordpress.com/the-amsterdam-partch-project/Rose-Petal-Jam-Tour-17-18>.

### 3.1.2.1 Bob Gilmore

Bob Gilmore (1961-2015) was the artistic leader of Scordatura from 2006 until 2015. Beside that he had done major work as a musicologist with his autobiography on Partch *Harry Partch: An Autobiography* in 1998.

### 3.1.2.2 Chris Rainier

Rainier had built replicas of Partch's different Adapted Guitars of which he had used some in his own compositions on the album *ZOZOBRA* (2018) – "a solo album of avant-folk songs on various microtonal guitars"<sup>166</sup> – After finishing his postgraduate on microtonal music in Sidney (2013) he started touring with Partch's more unknown works for voice and Adapted Guitar such as *December 1942* in Europe. He also currently lectures on Partch's music and his guitars. In 2017 he becomes a member of the Scordatura ensemble in which he plays Partch' Adapted Guitars and other Partch's instruments.

### 3.1.3 Newband | Dean Drummond

Dean Drummond (1949-2013) was a member of Partch's ensemble during the 1960's. He was a resident of San Diego where he had met Partch in 1964 (Drummond was only 16 years old).<sup>167</sup> He had premiered several of his music-drama's like *Daphne of the Dunes* and *Delusion of the Fury* and also featured on the recordings at the time. After Danlee Mitchell's retirement in 1990 Drummond was appointed as caretaker of the Partch's instruments. He acquired them all for his Newband ensemble and made copies. Afterwards he stayed responsible for the instrumentarium until his death in 2013.<sup>168</sup> Since 1999 all instruments were collected in the Montclair State University in New Jersey. He had also invented instruments tuned according to Partch's 43-tones such as the *Zoomoosophone* in 1978 which was constructed of 129 aluminium tubes and played with a cello bow.<sup>169</sup>

In 1976 Drummond moved to New York. There he founded with his wife Stefani Starin the music ensemble Newband which after Partch's death continued to perform Partch's repertoire on the original instruments.<sup>170</sup> The ensemble recorded microtonal works by other composers like John Cage, John Zorn and original compositions by Drummond as well. His own compositions at times even use original Partch instruments. Drummond, though, addressed the problem of touring with Partch's

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<sup>166</sup> Rainier, Chris, *About*, accessed on 20 september 2019, [http://www.chrisrainier.net/p/home\\_28.html](http://www.chrisrainier.net/p/home_28.html).

<sup>167</sup> Chusid (2000: 87).

<sup>168</sup> Ibid. (2000: 87).

<sup>169</sup> Agins, V. Michelle, "Dean Drummond, Musician and Instrument Maker, Dies at 64", accessed on 10 October <https://www.nytimes.com/2013/04/18/arts/music/dean-drummond-composer-and-musician-dies-at-64.html>.

<sup>170</sup> Chusid (2000: 87).

heavy-weighted instruments: “They’re prided out of what anyone could afford freight-wise. It prohibits much touring to Europe or even California.” And further: “What [Partch] created stands in the way he wanted to do. It’s like building a bigger house than you can afford to upkeep.”, commenting on the impractical “big and cumbersome” instruments that add up to his status of a marginal composer instead of spreading just intonated music and instruments around the world.<sup>171</sup>

#### 3.1.4 The Harry Partch Ensemble of Charles Corey

After his teacher Dean Drummond had passed away in 2013 Charles Corey became head of the Partch instrumentarium. In 2014 the instruments were moved to the University of Washington, Seattle, which is their current home.<sup>172</sup> Here Corey is also Professor of composition. In some of his own compositions he introduced Partch’s instruments, like: *Visions from an Unceasing Somnolence* (2018-19) written for the Harry Partch Ensemble with Adapted Viola, Kithara II, Surrogate Kithara, Chromelodeon I, Diamond Marimba, Bass Marimba, Cloud-Chamber Bowls, Spoils of War; or *The Antikythera Mechanism* (2017) for Baritone Voice and Adapted Guitar I, and the text by Corey. His compositions as well use different tuning systems that range from pieces with standard tuning in or else various tuning systems at the same time.<sup>173</sup> He directed Partch’s *The Potion Scene, The Bewitched—a Ballet Satire* (2015) and *U.S. Highball* during a large Harry Partch Festival in Washington.

#### 3.1.5 Ben Johnston

Ben Johnston (1926-2019) was a composer that had studied with Partch. In 1950 he drops out of Cincinnati Conservatory of Music and starts a correspondence with Partch after having read *Genesis of a Music*. He next went to Gualala, California for an apprenticeship of six months in Partch’s studio.<sup>174</sup> He is heard on the recordings of Partch’s music from that time and meanwhile helped constructing the instruments. After the apprenticeship, he attended Mills College where Darius Milhaud was a teacher. Here he also met John Cage. He worked again with Partch on the production of *The Bewitched* at the University of Illinois.<sup>175</sup>

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<sup>171</sup> Ibid. (2000: 87).

<sup>172</sup> De Pue, Joanne, accessed on 21 august 2019 <https://music.washington.edu/news/2014/11/20/harry-partch-instrumentarium-takes-residency-uw>

<sup>173</sup> Corey Charles, *Bio*, accessed on 28 september 2019 <https://www.charlescorey.com/bio>.

<sup>174</sup> Johnston (1983: 226).

<sup>175</sup> *Ben Johnston: March 15, 1926 - July 21, 2019*. 21 July 2019, accessed on 29 september 2019 <http://www.corporealmeadows.com/news-oped>.

Although influenced by Partch's theory, his own works after 1960 are written for traditional instruments with a notation system close to the Western notation based on actual pitch.<sup>176</sup> Instead of just intonation Johnston was interested in a "more nearly perfect" tuning using the higher partials of the overtone series, called the extended just intonation for which he introduces extra symbols ( $\overset{7}{L}$ ), undecimal ( $\uparrow \downarrow$ ), tridecimal ( $\overset{13}{L} \text{ } \text{E1}$ ), and further prime-numbers.<sup>177</sup> He admits that he kept feeling connected to Western art music and furthermore:

It gradually became clear that [...] Partch's was [not] the best path for me, [...] rather the forbidding one of getting traditionally trained performers using conventional instruments to alter their performance practices sufficiently to play just tuned music elaborated to the point of microtonality.<sup>178</sup>

Johnston did not build or used new instruments for his compositions.<sup>179</sup> He wrote extensively for string quartet because with string instruments he could find fingerings and tunings in extended just intonation, and when working with fixed-pitch instruments like the piano he re-tuned them.<sup>180</sup> In an effort to unite Partch's just intonated music with western musical tradition Johnston had made arrangements of Partch's *Barstow* and the *11 Intrusions* (1994) for the Kronos String Quartet.<sup>181</sup> The artistic director of Kronos Quartet recalls the negative comments he received on these arrangements, but also witnesses that:

[the music] doesn't sound like what it sounded like in the 1940's – it sounds like something else. But It's too important a body of work not to have it as music that can be played by musicians who are interested in exploring it."<sup>182</sup>

In the end the arrangements are performed by many prestigious string quartets around the world such as the Kronos Quartet and the Ligeti Quartet. Johnston wrote these arrangements also in standard pitch notation.<sup>183</sup> The overtone intervals are not played on adapted violins, but on standard violins by musicians with "good ears".<sup>184</sup> The musicians can practice with drones or with synthesizers to get the pitches correct.<sup>ii</sup>

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<sup>176</sup> Kassel, "Johnston, Ben(jamin Burwell)", accessed on 16 August 2019, <https://vpn.ap.be/grovemusic/view/10.1093/gmo/9781561592630.001.0001/,DanaInfo=www.oxfordmusiconline.com,SSL+omo-9781561592630-e-0000014424?rskey=Sy7phe>

<sup>177</sup> Ibid.

<sup>178</sup> Johnston (1983: 226).

<sup>179</sup> Snyder (2010: 20).

<sup>180</sup> Ibid. (2010: 20).

<sup>181</sup> Johnston (2006: xxxvii).

<sup>182</sup> Chudid (2000: 90).

<sup>183</sup> f which the scores were published in 1997, Baltimore.

<sup>184</sup> Silverman, "Preface", accessed on 13 November 2019, <https://forum.makemusic.com/attach.aspx/6229/Partch.pdf>.

To sum up, Johnston is an important example of a composer looking for an agreement between ET and JI while Partch really opposed to a music theory in which both ET and JI exist. So Johnston's music philosophy and arrangements are quite an inspiration for my own arrangements of Partch's music for a classical instrument.

## 3.2 Timbre and Tuning of the Guitar

Here is a survey of preparations and experiments with timbre, dynamics, tunings and fingerboard rearrangements. Regarding the experiments with timbre, a short summary of techniques and preparations will be given. In order to arrange Partch's music written for his self-built instruments for the classical guitar it is foremost to consider the timbre, and more importantly its tuning.

### 3.2.1 Overview of 20<sup>th</sup> and 21<sup>st</sup> Century Guitar Preparations

Partch's instruments has shown composers the possibility of building new instruments independently.<sup>185</sup> A curious hobbyist can try to adapt his/her traditional instruments inspired by Partch's modifications of the steel string guitar in 1934. Many electric guitarists modified their instruments to Partch's example. Important re-buildings are found with guitars by Fred Frith (1949), Bjørn Einar Fongaard (1919–1980), Hans Raichel (1949-2011) and Paolo Angeli (1970). Some specific examples of rebuilding a guitar is Raichels bodyless electric guitar with two necks joined together; Frith had developed an eight-string fretless electric guitar; Fongaard (1919–1980) had adapted the fretboard to a quartertone guitar that he played with a bow.<sup>186</sup> Paolo Angeli currently tours around the world with his "Sardinian prepared guitar" which has 18 chords, and is at the same time a guitar, cello and drums, with hammers and pedals. These adapted guitars are of course developed by craftsmen that have a thorough knowledge of instrument/guitar building. An example of adapted classical guitars is found with avant-garde composer Kagel in his composition *Tactil* (1970) for two guitars which had their strings of ca. six meters connected to a piano string to keep the resonance.

During the second half of the 20<sup>th</sup> century composers and guitarists that were looking for new sound universes were inspired by Cage's prepared piano (first used in 1938-40). Cage had prepared the piano with various objects attached to the strings. The objects manipulated the timbre, created harmonics and percussion.<sup>187</sup> Cage experimented with curious objects such as rubber, nuts, wood,

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<sup>185</sup> Davies, Hugh, "Microtonal Instruments", accessed on 12 august 2019 ,<https://vpn.ap.be/grovemusic/view/10.1093/gmo/9781561592630.001.0001/DanaInfo=www.oxfordmusiconline.com,SSL+omo-9781561592630-e-0000047628#0000047628.4.1>.

<sup>186</sup> Bates, Enda, "The prepared guitar", accessed on 27 august 2019 <http://www.endabates.net/AugmentedGuitar.html>.

<sup>187</sup> Schneider (1985: 179-180).

plastic, cloth, and many household materials.<sup>188</sup> Similar preparations were tried out by guitarists, especially on the electric guitar. Keith Rowe was the first one for the guitar to appropriate Cage's preparations in 1965. He used a pencil to create a third bridge. Middle bridges can be constructed by inserting a rod (thick as a pencil) or stick under the strings on the fretboard that cuts a string in half so that the amount of strings to play is doubled.<sup>189</sup> Hans Reichel in the 1980's designed his Pick-Behind-the-Bridge guitars.<sup>190</sup> The sounds produced with a middle bridge are generally quite similar to gongs and bells. Interestingly, Partch's instruments often have third bridges such as the moveable rods on the Kithara (see Kithara §2.2.2). When a third bridge is longer than a pencil one can use it as a handle to either slide for glissando's or move it up and down for bends and trills.<sup>191</sup> Other bridges used are a screwdriver or drumsticks.

The 24-page pamphlet of *Prepared Guitar Techniques* (1990) by guitar duo Elgart/Yates gives further information on preparations for guitar and they recorded the album *Prepared Guitar*. Next, Bart Hopkin and Yuri Landman wrote an overview of guitar preparations called *Nice Noise* (2012). Further examples of objects and sounds on the guitar are:

- Damp sounds by weaving soft cloth or strip of foam rubber over and under the strings close to the bridge or 5 cm from the bridge (this brings out overtones).<sup>192</sup>
- Harmonic damping sounds by adjusting foam at 14<sup>th</sup> or 15<sup>th</sup> fret.<sup>193</sup>
- Rattles and buzzing noises when attaching loose objects to the strings: a small coil spring as found in pens or lightweight household wire. To keep the wire positioned at the bridge Hopkin and Landman advise to slip one end under the string in the small space beyond the saddle to form a small, loose loop, next to bend the wire in the same way at the opposite end around the string.<sup>194</sup> Another way is to weave tinfoil and paper rattles between the strings at the bridge.<sup>195</sup> Further without adding objects one can stretch one string over another at the crossing above the nut.<sup>196</sup> A popular 'bouncing hammer-rattle sound' is caused by alligators clips on the strings that 'lean' against a following string.<sup>197</sup> Finally, a buzzing bridge can be built in wood as a rectangular block very close to the string height and positioned at the bridge.

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<sup>188</sup> Davis, Ian, "An Introduction to the Prepared Piano and How to Notate It", accessed on 27 august 2019 <https://flypaper.soundfly.com/write/an-introduction-to-the-prepared-piano-its-most-famous-pieces-and-how-to-notate-it/>.

<sup>189</sup> Hopkin and Landman (2012: 24).

<sup>190</sup> Reichel had placed an extra pick-up.

<sup>191</sup> Hopkin and Landman (2012: 24).

<sup>192</sup> Ibid. (2012: 11).

<sup>193</sup> Ibid. (2012: 12).

<sup>194</sup> Ibid. (2012: 14).

<sup>195</sup> Ibid. (2012: 16).

<sup>196</sup> Ibid. (2012: 18).

<sup>197</sup> Ibid. (2012: 17).

- Middle bridges when positioned a few centimetres from the regular bridge under the strings make the strings shorter. The sound effects are percussive.<sup>198</sup>
- Weights such as alligator clips, paperclips (used often, but not great sound quality) as fisher split shot sinkers (to prevent the fishing line from floating above) are added for their gong-like quality.<sup>199</sup>
- Violin bows to sustain the vibrations of the strings.<sup>200</sup>
- Hammering the strings.<sup>201</sup>

A few examples of compositions and guitar players are:

- Philip Drogoz (1937) in his composition *Prélude à la mise à mort* (1973) for prepared guitar asks the performer to use needles and wire in order “to make it ring with gamelan effects.”<sup>iii</sup>
- Schneider’s *Voyage* (1976) has a plectrum between the fourth and sixth string for a gong sound.<sup>202</sup>
- Nikita Koshkin in *Piece with Clocks* asks for cork, matches and foam mutes.
- On John Zorn’s album *Massada Guitars* and *The Book of Heads No. 13* Marc Ribot used car keys and creates harp-like sounds a plastic pen as a third bridge which he moves around the fingerboard.
- Fred Frith on *Guitar Solos* and in collaborations with John Zorn.
- Lee Ranaldo and Thurston Moore from Sonic Youth and Glenn Branca.
- Noël Akchoté’s on his album of guitar arrangements of Christian Wolff’s *For Prepared Piano & Pairs* 2016, makes use of all kind of preparations.

The list of guitar preparations in fact are endless.<sup>203</sup> Then, during the 20<sup>th</sup> century alternative playing techniques on a guitar also gained in popularity.

### 3.2.2 ‘New’ Techniques on the Classical Guitar

Composers for guitar start to add following guitar playing techniques to their compositions:<sup>204</sup> glissandi, bends, scordatura, and – inspired by flamenco guitarists – percussion on the body of the guitar.<sup>205</sup> The most common percussion techniques are tambura (a struck on the chord at the bridge with the flesh of the thumb) and the golpe (involves tapping on the body of the guitar with the

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<sup>198</sup> Ibid. (2012: 27).

<sup>199</sup> Ibid. (2012: 21).

<sup>200</sup> Ibid. (2012: 44).

<sup>201</sup> Ibid. (2012: 45).

<sup>202</sup> Schneider (1985: 187).

<sup>203</sup> For preparations applied to a *cheap* guitar.

<sup>204</sup> Schneider, John, *Contemporary Guitar*, 1985.

<sup>205</sup> Davies, Hugh, “Instrumental modifications and extended performance techniques”, accessed on 12 august 2019, <https://vpn.ap.be/grovemusic/view/10.1093/gmo/9781561592630.001.0001/Danainfo=www.oxfordmusiconline.com,SSL+omo-9781561592630-e-0000047629#0000047629.3.1/>

fingers).<sup>206</sup> Another popular preparation that creates percussion is ‘crossed-string technique’ in which two strings are crossed and create rattling textures.<sup>207</sup>

Microtones can be produced as transitions from one note to another by bending a given note or sliding on the neck.<sup>208</sup> By moving the finger of the left hand from its fret position the pitch changes and this sound is called a ‘bend-gliss’.<sup>209</sup> This bend on the guitar is still limited to two semitones.<sup>210</sup> Composers also looked at Hawaiian and Blues guitarists and their slide guitars.<sup>211</sup> The glissandi are created by a gleitstahl, indicated with ‘M.G.’ (Mit Glas) or ‘O.G.’ (Ohne Glas).<sup>212</sup> Interestingly, Partch had been one of the first composers to use ‘slide-gliss’ in his compositions with his fretless Adapted Guitar II that uses colors instead of frets to mark the divisions. At times a composer asks for a ‘scord-gliss’ which is tuning the string while it is vibrating, for instance Gilardino’s *Abreuana* (1971).<sup>213</sup> Another is the ‘scratch-gliss’ when the left hand thumb scrapes along the bass string.<sup>214</sup> Finally, squeak-tones are created by rubbing the wood of the body of the guitar.

Additionally, the timbre of the instrument can change drastically by accents or vibratos of the left hand. In fact, timbre is always determined by the right hand and its relationship to the string – see nail shaping.<sup>215</sup> Nowadays, as Schneider remarks, it has become rather hard for a composer to describe and notate the demands for a certain timbre.<sup>216</sup> Indeed, since the 1950’s every part of the guitar could be used for different sound textures.<sup>217</sup>

### 3.2.3 Re-fretting and Tuning

Because Partch’s scales avoid western musical intervals the idea of playing a traditional instrument in equal temperament is contradictory. Therefore, it is important to focus on guitar preparations in terms of fret spacing and tuning.

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<sup>206</sup> From flamenco: “John Gavall: “from a percussion point of view, the guitar’s soundbox may be considered as a small battery of wooden drums of varying resonance characteristics” (177) (Schneider 173).”

<sup>207</sup> Schneider (1985: 181).

<sup>208</sup> Ibid. (1985: 160).

<sup>209</sup> Ibid. (1985: 148).

<sup>210</sup> Ibid. (1985: 149).

<sup>211</sup> The slide guitar uses a method of stopping the string from above with a bottleneck, rather than from below with a fret. This bottleneck shortens the vibration length of the string by reflecting the string’s vibrations without absorbing them. It gives a three-octave range of continuous pitch on each string and extends the range from the usual three-and-a-half octaves to over five octaves (Schneider 148).

<sup>212</sup> Schneider (1985: 149).

<sup>213</sup> Ibid. (1985: 152).

<sup>214</sup> Ibid. (1985: 152).

<sup>215</sup> Ibid. (1985: 13).

<sup>216</sup> Ibid. (1985: 96).

<sup>217</sup> Ibid. (1985: 102).

Scordatura means retuning the open strings E A D G B E. To reach microtones one can detune the strings.<sup>218</sup> For example, the E-strings into E-, which means slightly below the normal E.

Unfortunately, one cannot tune the strings of a guitar in twelve-tone equal temperament (TET) into just intonation. The notes on the fretboard would simply not fall into place because of the standard spacing of the frets.<sup>219</sup> In this sense, special gear like capodasters and spidercapodasters are useless because they are used only for modulation on a 12-TET guitar. Of course there are ways to play microtones on a 12-TET guitar with a gleitstahl/bottleneck that is placed on the desired pitch between frets or mainly by playing bends of single pitches.<sup>220</sup> But to arrive at Partch's 43-tone the way is with a rearrangement of the fretboard.

One kind of fret spacing is the divisional— which means to increase the equally spaced intervals – for example the quartertones on a quartertone guitar has twenty-four notes per octave.<sup>221</sup> Examples are found with Aloïs Haba and Julian Carrillo.<sup>222</sup> But, just intonation is about microtones in unequal distances apart and therefore unequal divisions of the fretboard are wanted. The German luthier Walter Vogt had created moveable fret mechanisms and the American luthier Mark Ranking used magnets on the neck to add interchangeable fretboards. John Schneider in the 80' made use of interchangeable fretboard mechanisms to play arrangements of Lou Harrison's retuned harp pieces.<sup>223</sup> In fact, Lou Harrison was the first composer to write music for the classical just intonated guitar.<sup>224</sup> Of course, an adventurous guitarist can decide to remove all the frets to play fretless. In any case, Partch had adapted his steel string guitar first with a small amount of rearranged frets into specific places and had also built a fretless electric guitar that unfortunately was lost. In the first version of *The Letter* the Adapted Guitar I has a fretless passage of tremolos beyond the twelfth fret. On an acoustic guitar it is more interesting to remain with frets for a stronger sound.

The fretlets designed by John Schneider are practical devices.<sup>225</sup> These are moveable frets that one can glue on the fingerboard without damaging the guitar, and afterwards they can be removed them easily. In Chapter 4 and 5 the possibilities of reorganizing the frets and the scordatura of the strings are discussed for each arrangement. We will see that the first part of the *Two Studies* in fact does

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<sup>218</sup> On <http://tommudd.co.uk/justintonation/>, a toolkit for just intonation can be downloaded in order to hear and play intervals from different existing systems of just intonation. Then they can be played with the computer or a MIDI keyboard. For Partch's just intonation the root note has to be altered to a G.

<sup>219</sup> Hopkin and Landman (2012: 25).

<sup>220</sup> Ibid. (2012: 25).

<sup>221</sup> Schneider (2004: 1).

<sup>222</sup> The Mexican composer Julian Carrillo also wrote for eight-tones. A famous theory of microtonal music by Carrillo is *Sonido 13* (1900).

<sup>223</sup> Schneider (2004: 6).

<sup>224</sup> Ibid. (2004: 6).

<sup>225</sup> See Schneider, John, <https://fretlet.com/>.

not have any rearrangements of the frets and can be performed on a standard classical guitar in scordatura. That is not possible for the second part of the *Two Studies*, and by no means for *The Letter*.<sup>226</sup>

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<sup>226</sup> Hopkin and Landman (2012: 63).

## 4 Arranging The Letter

Arranging *The Letter* for classical guitars has been an interesting work. There arrived a few difficulties during the process: firstly, Partch rewrote *The Letter* several times and kept adding new instruments to it. When reading the different versions confusion arises about the tunings of the instruments because Partch kept modifying and re-tuning his original instruments over time. A chronological overview of the versions of *The Letter* and the modifications of the instruments is therefore crucial.<sup>227</sup> Next, the biggest challenge is confronted: how to transcribe the 7-limit and 11-limit ratios in the different parts to a standard instrument? The various stages of arranging are discussed in this Chapter, starting with an analysis of the original scores, the instrumentation and the voice, and moving on to the transcriptions and solutions on the classical guitar(s). While performing the piece, the musicians need to take into account the corporeality and totality of the music, namely the voice and body language. More about how to have the text, voice, accompanying music and the performer in balance in §4.2.3.

### 4.1 Analysis of the Music Sheet

*The Letter* has a cyclical form. The instruments remain static while the voice is intoning. The voice recites and seems to be following the other instruments, or the instruments follow the voice. In the parts with the voice the composers changes 7/4 and 12/7 ratios. The repetitive chords on the Kithara are utonal (minor) and then otonal (major). In the instrumental parts the static harmony of before becomes complex and dissonant.<sup>228</sup> In these instrumental intermezzo's the harmonies deviate drastically from the ostinato (mostly G).<sup>229</sup> It changes between triads of Bb7 and A, and cadences often on Eb.<sup>230</sup> Also the measures change from 6/8 to 3/4 and 4/4. Next, the Kithara part has slides with the rod that make the sound very Partch-like. The final chords of the piece are approximately a Gm – Fm – Cm.

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<sup>227</sup> See the chronological overview in appendix IV of Partch's *Genesis of a Music*.

<sup>228</sup> Foreword Charles Corey in 1972' Schott edition Partch, in: Harry, *The Letter A Depression Message from a Hobo Friend from "The Wayward" (1943/1955/1972)*, Mainz: Schott, 2018.

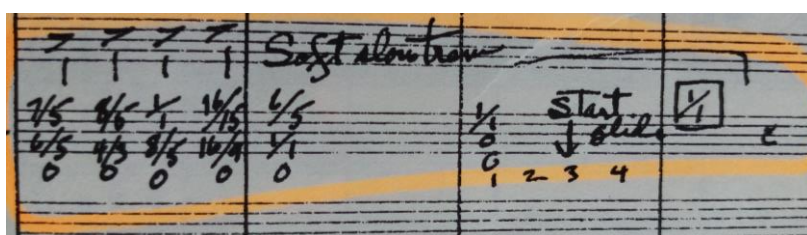
<sup>229</sup> Foreword Charles Corey in 1972' Schott edition Partch, in: Harry, *The Letter A Depression Message from a Hobo Friend from "The Wayward" (1943/1955/1972)*, Mainz: Schott, 2018.

<sup>230</sup> Gann, Kyle, "Keynote Address for the 2012 Harry Partch Conference in Boston ", In: *blog*, Boston, 2012, accessed on 20 august 2019 <https://www.kylegann.com/PartchKeynote.html>

#### 4.1.1 The Different Versions

My arrangements are based on the first version titled *Letter from Hobo Pablo* (1943) for voice, Adapted Guitar I and Kithara II.<sup>231</sup> The second version was composed in 1950, in which he added the Diamond Marimba (built in 1945/46), and the Bass Marimba (built in 1949). The Adapted Guitar I in this second version is the fretless electric one. This score was not published because at the time Partch was already working on the third version, published in 1955. Therefore the only score found of the second version is a corrected one with the third version – messily – written on top of it.<sup>232</sup> The third version (1955) has additions of the Castor and Pollux (part of the Harmonic Canon), a Surrogate Kithara and instead of Kithara I he uses Kithara II. On this sheet he also changes the ratios of the tremolos of the Adapted Guitar I from  $7/4$  and  $12/7$  ratios into  $7/5$   $10/7$  higher ratios.

Previously I had tried to work from the fourth and last version, that is Schott's edition *The Letter A Depression Message from a Hobo Friend from "The Wayward"*. This version was rewritten as part of the film *The Dreamer That Remains* in 1972, for New Kithara I, Blue Rainbow, Surrogate Kithara, Omicron Belly Drum, Adapted Guitar III, Diamond Marimba and Bass Marimba.<sup>233</sup> Although this edition is remarkable, it is also confusing. There are many instruments to transcribe, and besides, the part of the Blue Rainbow is not played on the recording.<sup>234</sup> The Adapted Guitar III plays chords on every beat during the instrumental intermezzos and finishes the intermezzo with glides. When comparing the first with the last version, the instrumental parts are always two or three bars longer in the first version.



Figur 1 (marked in orange) a fragment from the Adapted Guitar part in *The Letter* (1972)

<sup>231</sup> Harry Partch Estate Archive, The Sousa Archives and Center for American Music, University of Illinois at Urbana-Champaign, 1943.

<sup>232</sup> Personal e-mail communication Chris Rainier 25 August 2019.

<sup>233</sup> Foreword Charles Corey in 1972' Schott edition Partch, in: Harry, *The Letter A Depression Message from a Hobo Friend from "The Wayward"* (1943/1955/1972), Mainz: Schott, 2018.

<sup>234</sup> Personal e-mail communication, Chris Rainier, 7th of April 2019.

The Kithara part in the different versions is quite confusing. As mentioned before, Partch had changed the tuning of this instrument several times and then the hexads have different numbers in the tablature of the various versions. So when comparing the different versions different numbers refer to the same hexads. For example, in the first version of the Letter (1943) there is the tuning chart one (see §2.2.2.2) and for the fourth version (1972) there is another tuning chart for the New Kithara, as seen on figure 17.

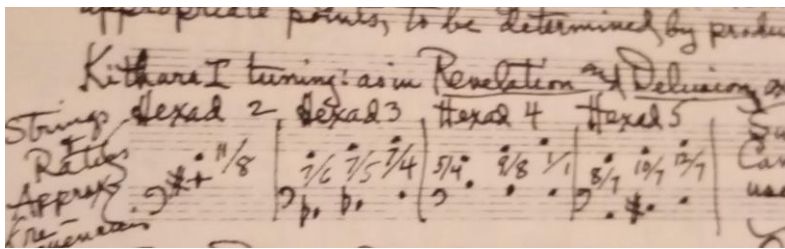


Figure 17 Tuning of New Kithara I of the hexads from *The Letter*

For the transcription of the Kithara part for two guitars also it is important to know that In the first version the arpeggios in the first instrumental intermezzo are hexad 11 and 9, in the last version only hexad 9. In order to have all the strings represented on the guitar, it is best to take only hexad 9 to transcribe (see further §4.2.1.).

#### 4.1.2 Instrumentation

My arrangements are based on the first version, titled *Letter from Hobo Pablo* (1943) for voice, Adapted Guitar I and Kithara I. So Partch's notation systems for these two instruments are explained here.

##### 4.1.2.1 Decryption of the Adapted guitar I

Partch's original Adapted Guitar I had a scordatura of double strings Eb (8/5) – Eb – B (5/4)– B - G (1/1) - G. The tablature of Partch's AG I is written on staves that represent these strings from low to high and therefore the player knows which string to play.<sup>235</sup> The ratios are written on specific lines for the fret positions. The single pitches are mostly a tremolo of 4 strikes per eight notes. For example, at the beginning of *The Letter* the Adapted Guitar I has single pitch tremolo's of 7/4 and

<sup>235</sup> Schneider (1985: 161)

12/7 played on the 1/1 or G-string – the ratios are written in the middle of the staves. Further on, there are chords formed and built by ratios written above each other. A ‘zero’ means an open string.

An overview of the chords in *The Letter* of the Adapted Guitar are written here with *the name* of the chord.<sup>236</sup>

Table 3 Augmented Eb-chord

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<b>Eb</b>	0
<b>G</b>	0
<b>B</b>	3/2

Table 4 Microtonal F/G-chord (?)

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<b>Eb</b>	12/11
<b>G</b>	0
<b>B</b>	20/11

Table 5 Eb-major chord

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<b>Eb</b>	0
<b>G</b>	0
<b>B</b>	6/5

Table 6 Microtonal G-minor chord

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<b>Eb</b>	7/6
<b>G</b>	0
<b>B</b>	7/4

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<sup>236</sup> Deciding to name a chord in terms of Western musical analysis is maybe ideally, moreover it gives some idea of Partch’s tonal compositions and of the fingerings of the Adapted Guitar I.

Table 7 G-minor chord

<b>E<sub>b</sub></b>	3/2
<b>G</b>	0
<b>B</b>	6/5

Table 8 F-minor chord

<b>E<sub>b</sub></b>	16/9
<b>G</b>	16/15
<b>B</b>	4/3

Table 9 C-minor chord

<b>E<sub>b</sub></b>	1/1
<b>G</b>	0
<b>B</b>	4/3

The instrumental parts has glissandos of whole octaves that Partch writes on the sheets as 'glide' with the beats as 1 - 2 - 3 - 4 and an arrow pointed at "3" that shows the onset of the glide on the third beat. Then, two beats remain to arrive up to the octave 2/1, written as 1/1 in a square.

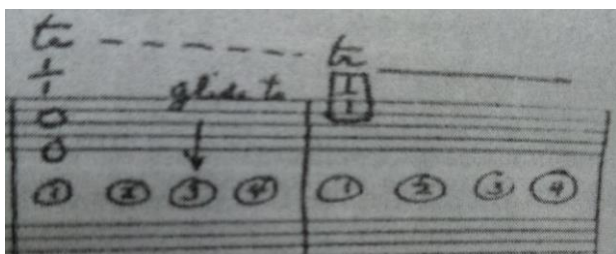


Figure 18 Glissando's Adapted Guitar I from the first version (1943)

#### 4.1.2.2 Decryption of the Kithara I

The numbers below the notes or groups of notes refer to a particular hexad (a group of six strings) of the Kithara – 1 to 12 from left to right (from the player's point of view). The hexads are then written as a tablature from D above middle C on the stave. Hexads 1 and 12 have glass rods inserted to slide the six strings up and down and to retune these hexads. The hexad 12 is called 'orange' as seen on the music sheet.  $3/2$  ratio is the open upper string of the hexad 12. So the ratios written before 'orange' are the ratios of the upper string and determine the placement of the slides (see figure 19).<sup>237</sup>

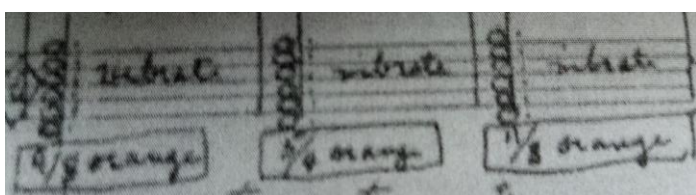


Figure 19 Slides of Kithara 'orange' from the first version

In order to arrange this part for classical guitar I will need a guitar of six strings tuned into hexad 12 to enable the slides. Another guitar will have a scordatura of the open strings in  $7/4$   $7/5$   $7/6$  and  $12/7$   $10/7$   $8/7$  for the repetitive arpeggios (see further §4.3).

#### 4.1.3 Text and the Voice

The text of *the Letter* was taken from an actual letter that Partch had received from a fellow hobo friend called Pablo in October, 1935.<sup>238</sup> A voice recites the text that is accompanied by an ostinato of an Adapted Guitar and Kithara and followed by instrumental interjections. These intermezzos underline the dark humour of the letter, but also the rapture of the reader when reading a letter from an old friend. It seems as if these instrumental parts are the inner reactions and surprises felt by the reader himself while reading. In fact, the performer/guitarist must incorporate Partch's idea of the corporeal. The voice and the body of the performer are used in a more theatrical way than a classical musician is used to do.

<sup>237</sup> Schneider (1985: 162).

<sup>238</sup> Foreword Charles Corey in 1972' Schott edition, in: Partch, Harry, *The Letter A Depression Message from a Hobo Friend from "The Wayward" (1943/1955/1972)*, Mainz: Schott, 2018.

The theme is the social situation during the Great Depression, namely the many hobo's and their senseless way of living.<sup>239</sup> Granade also emphasizes the shame of being unemployed on part of the hobos.<sup>240</sup> In fact, *The Letter* is a testimony of this period in history and so it appears that Partch had invented a new documentary style in music (as in *Bitter Music*).<sup>241</sup> The character of *The Letter* is demoralized (he wishes his wife to be dead) and is cynic and passive about his situation ("And I am not good looking to get by that way, do you get my drift?). The way the voice glides between two ratios so close together ( $8/7$  and  $7/6$ ) highlights the way of speaking of the hobo and his cynic state of mind. Partch's term for the resolution by narrow intervals of the voice is *tonality flux*.<sup>242</sup> Furthermore, Partch has an improvisatory relationship with his musical instruments. So, he might have started reciting the text and then improvised the music of the instruments on the spot.

Partch' notation of the voice, as mentioned before, is with the Chromelodeon cue. When analysing the ratios from the Chromelodeon Cue, in the first phrase of *The Letter* the very narrow frequency ratios  $7/6$  and  $10/7$  alternate. I notated the voice differently from the standard notation of Partch with the Chromelodeon Cue and I developed a purely visual notation for personal use, introducing a single line that fluctuates above the text with its accompanied rhythm. The voice follows the line that is ascending and descending. The reason for this notation is because the notation in standard notes only makes sense if you have a Chromelodeon keyboard at hand that can play all forty-three tones.

My own visual support for the voice part is useful to know when sudden glides arrive, but it does not specify the different ratios. On the other hand one can listen to the recordings of *The Letter* or download a toolkit programme online for reference of the ratios' height.<sup>243</sup> When listening to the voice, it seems only to be speaking in a weird intonation, but at the same time very human-like. There are dramatic accents created by sudden glides of the voice such as "Gee!", or "It is cold out here" with an accent on 'cold'. This is shown by the line when it suddenly ascends or descends. Do note that when the voice is sounded in *The Letter*, the guitar is played pianissimo so that the audience can clearly understand the words of the text.

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<sup>239</sup> Granade (2014: 95).

<sup>240</sup> Granade (2014: 103).

<sup>241</sup> Granade (2014: 110).

<sup>242</sup> Foreword Charles Corey in 1972' Schott edition, in: Partch, Harry, *The Letter A Depression Message from a Hobo Friend from "The Wayward" (1943/1955/1972)*, Mainz: Schott, 2018.

<sup>243</sup> See [://tommudd.co.uk/justintonation/](http://tommudd.co.uk/justintonation/), in order to hear and play intervals from different existing systems of just intonation.

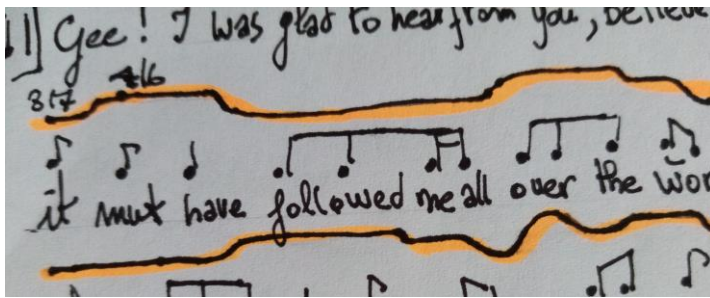


Figure 20 The Voice of *The Letter* in the arrangement for classical guitars

## 4.2 Preparing the Classical Guitar

One condition for an arrangement of Partch's music is to make sure to have all the tones of the piece available on the instrument. This implies that the 12-TET guitar's tuning and fret spacing have change drastically. While fretless instruments or slide guitars can be tuned into different microtonal tunings, a classical guitar cannot. Without interfering in the fret spacing the only option would be to play open tunings with the strings tuned into the specific just intonated ratios of Partch's composition and to add as much guitars as tones needed.

With guitars in *scordatura*, an arrangement of *The Letter* for four guitars might be doable. One guitarist could intone the voice part or else a separate singer or actor can be introduced. Some other idea arrived: what if a guitarist could play the open strings of two guitars simultaneously and is able to switch between the instruments during the performance? Then an arrangement of *The Letter* for four guitars can be performed by a guitar duo. Even if this idea seems far-fetched, musicians that are alternating between instruments during song has an off-beat visual effect that adds to Partch's idea of a total performance. Technically, it is also very performable because there aren't too many notes and the structure is cyclical. The set-up would be with each musician playing two guitars in *scordatura*: one guitar lying flat on a table in front of the musician and one guitar in a standard classical guitar position. If a musician does not agree to play two guitars at the same time, it suffices to add extra musicians. The downside of these guitars is the tuning that remains unstable at the beginning. To help the tuning in different ratios the *scordatura* is expressed in Hertz on the score. Importantly, compromises are made at the Kithara part because it remains having too many hexads with just intonated ratios to transcribe (see further §4.2.1.1.).

A more error-free solution for the classical guitar to play *The Letter* is to make actual changes of the fretboard by adding extra frets between the old fret positions and then to rearrange the old frets. This can be done by adding fretlets. They are instant frets, fabricated by John Schneider, to glue on

the fretboard.<sup>244</sup> Afterwards they can be removed without ruining the instrument. Consequently, one guitar with a rearranged fretboard (fretlets) can play the part of the Adapted Guitar I. The part of the Kithara though better remains for two unaltered guitars. The reason is that to perform the slides of a given hexad, the instrument needs open tunings from the Kithara. Therefore, the set-up for the Kithara part stays: two guitars in scordatura without fretboard rearrangements.

These preparations result in two different guitar duo's: one that has four guitars in scordatura, another that has three guitars with a re-fretted guitar and two guitars in scordatura (see §4.2.1), and, finally, one guitar solo (see §4.2.2) of the new re-fretted guitar or 'Adapted Classical Guitar'.

#### 4.2.1 Guitar Duo

The arrangements of *The Letter* for variable classical guitar duo combination are illustrated here. One duo has four guitars in scordatura: the Kithara part has two guitars as well as the Adapted Guitar part (see §4.2.1.1). The other duo is for two classical guitars in scordatura (the Kithara part) and one re-fretted guitar (the Adapted Guitar part) (see §4.2.1.2).

##### 4.2.1.1 Scordatura

Without rearranging the fretboard the amount of microtones in *The Letter* at least demands a set-up of four 12-TET guitars in scordatura and restrung. As announced at the beginning of the Chapter a guitar duo can work with each guitarist handling two classical guitars in scordatura at the same time. The reason of not making different parts for more guitarists is because the guitarists are only playing open tunings. In order to make the parts more adventurous and less tedious this set-up was introduced.

To transcribe the parts it is firstly necessary to sum up the ratios that occur in the different parts, next, to order the strings in the tunings that correspond with the ratios from the composition. The divergent tunings are then notated for each specific string in Hertz. If the musician is in the possession of a tuner that indicate the amount of Hertz of each string, the scordatura can be tuned according to the exact ratios.

#### *Kithara part transcribed for two guitars*

The Kithara part is transcribed for two guitars in scordatura. Obviously, there is an alternative notation needed for a musician that plays two guitars. The parts of the two guitars are written on

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<sup>244</sup> See Schneider, John, <https://fretlet.com/>.

staves as ‘Guitar 1’ and ‘Guitar 2’ and when one guitar is played, the other is not as indicated (see score in appendix §10.4).

Guitar 1 lies flat on a table and the musician plays arpeggios that can be played with the right hand alternating the fingers A – I – P / M – I – P. The scordatura of the guitar is exposed in Table 10.

Table 10 Scordatura of Guitar 1 Kithara part for two guitars

① E-string down to:	<b>7/4</b>	343 Hz
② E-string down to:	<b>12/7</b>	336 Hz
③ B-string up to:	<b>7/5</b>	259 Hz
④ B-string up to:	<b>10/7</b>	278 Hz
⑤ B-string down to:	<b>7/6</b>	228 Hz
⑥ B-string down to:	<b>8/7</b>	223 Hz

Yet, after experimenting with this tuning it appeared that restringing the guitar takes too much preparation time. Therefore it is better to lower the ratios by an octave – dividing the original amount of Hertz by two. Still, the sixth E-string needs to be changed into an A-string.

Table 11 Scordatura of Guitar 1 Kithara part for two guitars

① E-string down to:	<b>7/4</b>	171 Hz
② B-string down to:	<b>12/7</b>	168 Hz
③ G-string down to:	<b>7/5</b>	129 Hz
④ D-string down to:	<b>10/7</b>	139 Hz
⑤ A-string up to:	<b>7/6</b>	114 Hz
⑥ A-string up to:	<b>8/7</b>	111 Hz

These open strings are the only tones repeated in a specific order, so the notation of this guitar is transparent. Six lines represent the strings of the guitar from high to low, then zeros are written on the specific lines with the rhythm notated above the staves. The guitarist only needs to read the rhythm and the string order for a correct execution:

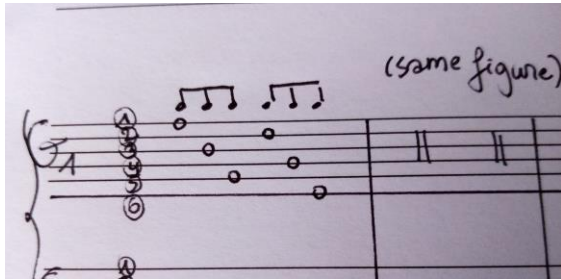


Figure 21 Tablature Kithara/Guitar 1 Arpeggio

Guitar 2 The guitarist holds guitar 2 in a standard classical guitar position. This guitar is tuned according to the Kithara's hexad 12. With this scordatura the guitar can play the passages with a gleitstahl like to the original Kithara part. The scordatura goes as follows:

Table 12 Scordatura of Guitar 2 Kithara part for two guitars

① E-string down to:	$\boxed{3/2}$ *	293 Hz
② B-string down to:	$\boxed{6/5}$	226 Hz
③ G-string	1/1	196 Hz
④ D-string up to:	12/7	168 Hz
⑤ A-string down to:	3/2	73 Hz
⑥ E-string down to	6/5	59 Hz

\*The ratios in squares are the octaves above the same ratios without them.

The notation of Guitar 2 is also a tablature of six lines representing the six strings. When the slide is used it is indicated with M.G. ("Mit Glass"), or without slide O.G. ("Ohne Glass"). The position of the

gleitstahl is then indicated with the numbers of the frets on the staves. The duration of the notes are written above the staves. The problem with this notation is to write where a gleitstahl is positioned when it is between frets. The exact spot for its positions can be calculated with a formula (that I will discuss further in detail in §4.2.1.2). The distance from the nut for  $7/4$  on a  $3/2$  string is +/- 9 cm from the nut, that is in between the second and third fret.<sup>245</sup> On the fretboard this distance is marked with a color blue. The  $7/4$  is in blue and so on the staves the color [Blue] is written instead of a number to indicate the fret. In this way the guitarist can find the position on the fretboard easily.

As said before, in the original version the Kithara part also has three bars with open hexads 11 and 9 (in the tuning of old Kithara I). Practically, that would mean adding extra two guitars in the open tunings of hexad 11 and 9 that would bring the final amount of instruments for the Kithara part to a total of four guitars. The last version of *The Letter* though does only include hexad 9 in these intermezzos. A third guitar would still be needed with an open tuning of hexad 9 ( $10/5$   $9/5$   $7/5$   $6/5$   $1/1$   $8/5$ ). To avoid having three guitars in scordatura of which one guitar is only played in one measure (namely, hexad 9), it is better to replace this hexad 9 arpeggio with ratios that are already available on one of the two already existing guitars. On Guitar 2 the three upper strings  $3/2$   $6/5$   $1/1$  can replace the open arpeggio's in these short fragments. In the end I decided to go for a fuller sound and to write arpeggios of the six open strings. This is one compromise I made in the transcription of the Kithara part:

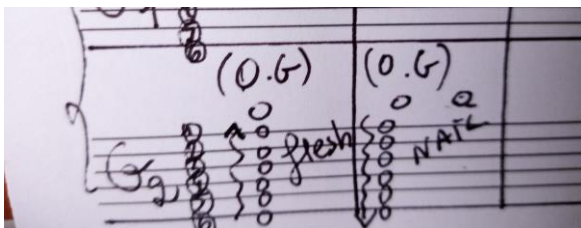


Figure 22 Tablature of the Guitar 2 playing the Kithara Part open hexad 12

The other compromise I made with the Kithara part is more of a crime to Partch's music philosophy, because I transcribed equal tempered notes on the G-string in the part of Guitar 2. While in the original sheet of the last version they are the just intonated  $11/8$  (C#) and  $5/4$  (B) and from hexad 4's  $1/1$   $9/8$   $5/4$  ratios. Here instead they are played on standard TET-frets and have a small deviation in

<sup>245</sup> The calculation is based on the format of a classical guitar with scale length sixty-five centimetres.

cents from the just intonated:  $11/8$  ('standard C#' + 1.3 cents / III TET-fret)  $9/8$  ('standard A' + 3.9 cents)  $5/4$  ('standard B' - 13.6 cents). To actually have them played properly, the fretboard should be adapted according to these ratios on the G-string (see § 4.2.1.2). In the future this can be done, but now the budget was limited to have also re-fretted this guitar.

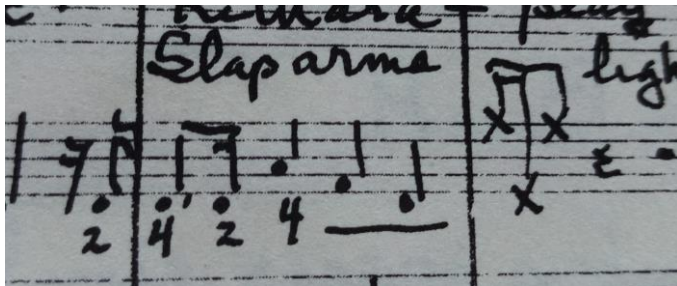


Figure 23 Fragment of hexad 4 and 2 of the Kithara part, Schott's 1972 Edition

This compromise results in following positions on the G-string:

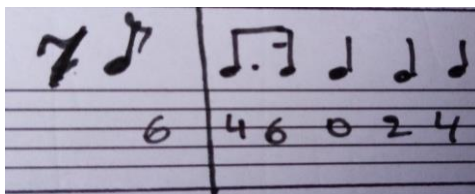


Figure 24 Tablature Guitar 2 compromise hexad 4

### Adapted Guitar Part for Two Guitars

For the Adapted Guitar part two classical guitars are played in following scordatura:

Table 13 Scordatura of Guitar 1 Adapted Guitar part for two guitars

① E-string tuned up:	$15/8$	367 Hz
② B-string	$5/4$	246 Hz
③ G-string	$1/1$	197 Hz
④ D-string tuned to Eb	$8/5$	155 Hz

⑤ E-string tuned up to	7/4	397 Hz
⑥ E-string tuned up to	12/7	336 Hz

Table 14 Scordatura of Guitar 2 Adapted Guitar part for two guitars

① E-string tuned up:	20/11	356 Hz
② B-string	12/11	213 Hz
③ G-string	1/1	196 Hz

The tablature of these two guitars are similar to the kithara with two systems of staves for the different guitars played by one musician.

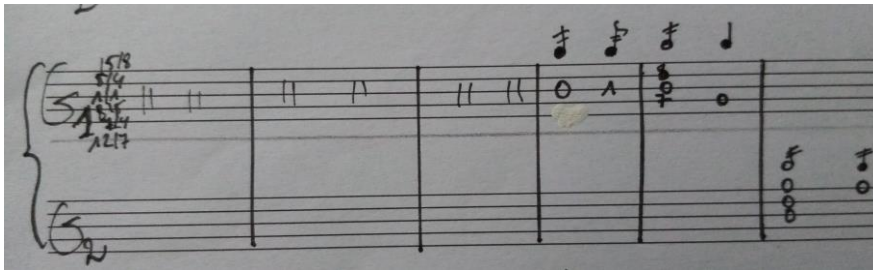


Figure 25 Working Version Tablature of the Adapted Guitar arranged for Two Classical Guitars

#### 4.2.1.2 Music Between the Frets: Rearrangements of Fretboard with Fretlets

The rearrangement of the fretboard was based on the 7- and 11-limit ratios from the Adapted Guitar I part in *The Letter* and the Harmonic Canon part in *Archytas' Enharmonic*. The arpeggios 7/4 7/5 7/6 and 12/7 10/7 8/7 from the Kithara part in *The Letter* can also be played with fretlets, but the slides of the bottleneck need the open tuning of hexad 12 scordatura, so here there is no re-organization done of the fretboard. Consequently, there remain two different guitars for one part – with one guitar in scordatura, based on hexad 12 from old Kithara I, and a second guitar in a scordatura for the single notes and arpeggio's.

I chose to tune and restring the guitar according to the amplified fretless Adapted Guitar I (1945) with three strings into a scordatura Eb – G – B. I did not choose double strings because with double strings techniques from a mandolin with a plectrum are used. In that case, the strings on the classical guitar have to be moved closer together. On the classical guitar a tremolo can be done with fingers P-I-M-A / P-M-I or soft tremolo with one i-finger held diagonally with the flesh caressing the six strings, instead of using a plectrum. Next, I selected the ratios from the compositions and then the amount of frets on each specific string.

It is advised to start with a fretless guitar so to remove all the frets and to fill up these gaps into a smooth fingerboard. The reason is that some of the fretlets would end up very close to the standard 12-TET frets so that it becomes impossible to position the finger properly on the 12-TET fret – such as the 9/5 that would be installed only a millimeter from the third TET-fret. Even so, for the sake of the beginner in microtonal performances, the ratios such as 4/3, which is a just intonated C that only differs 2,00 cents from the equal tempered C, could be kept as a standard C on the standard fret.<sup>246</sup> The reason is that it is not easy for the classical guitarist to immediately play a different organized fingerboard. The idea is to have some anchor points for the novice but anyway to gradually adapt the fingerboard with new fret positions.

I then delineated the amount of ratios for a performance of *The Letter*. The ratios for each string were decided on:

Table 15 Overview of ratios per string

<b>B-string</b>	4/3 ('standard C' +2.0 cents / I TET-fret) 3/2 ('standard D' +2.0 cents / III TET-fret) 12/7 7/4 (the 20/11 2/1 ('standard G' on VIII TET-fret). All the other frets (except XII and II) are removed from the neck.
<b>G-string</b>	28/27 16/15 ('standard Ab'+11.7 cents / I TET-fret) 9/8 ('standard A' +3.9 cents / 6/5 ('standard Bb' +15.6 cents / III TET-fret) 7/5 10/7 ('standard C#' +7 cents / II TET-fret) 2/1 (XII TET-fret)
<b>Eb-string</b>	1/1 (IV TET-fret) 7/6 8/7 12/11 9/5 8/5 ('standard Eb' octave+13,7 cents / XII TET-fret)

<sup>246</sup> To calculate the deviation of cents, following site was used: <http://www.sengpielaudio.com/calculator-centsratio.htm>. It is necessary to start with the amount of cents of a given just intonated pitch to calculate this deviation (Partch 461).

Then the exact positions for each ratio had to be figured out. Chris Rainier helped me with the formula to calculate the distance for each fret from the nut onto the fretboard.<sup>247</sup> I ultimately stepped to luthier Koen Fonteyne with the correct calculations for each ratio, the fretlets (ordered online) and one classical guitar. Fonteyne then re-fretted the fretboard of my old classical guitar (see appendix §10.1 for the calculations).



Figure 26: Schneider's tuning chart of Adapted Guitar I with the strings in double pair octaves

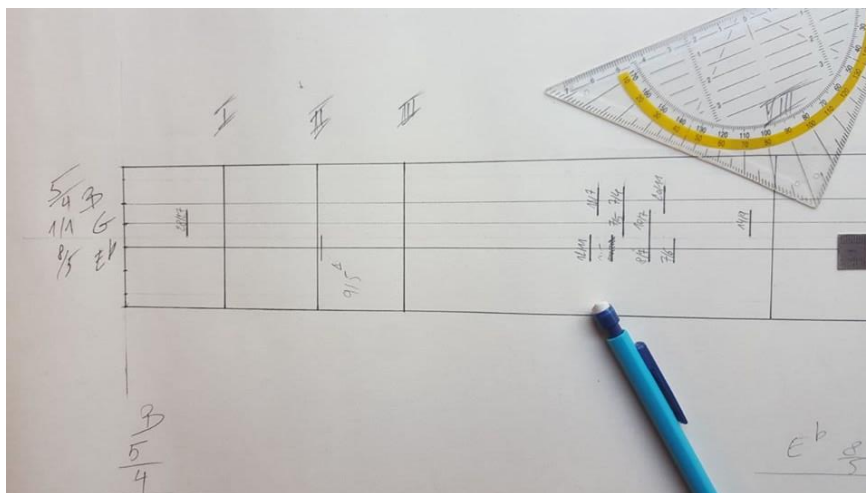


Figure 27 Drawing of the Fretboard of my Adapted Classical Guitar by Luthier Koen Fonteyne

<sup>247</sup> Rainier had once found the formula online, but then the site was taken down.



Figure 28 The Adapted Classical Guitar by Koen Fonteyne

The amount of frets is small and therefore are the gaps on the fretboard large. For someone being used to a standard 12-FRET-guitar, it works well to have as less new fret positions as possible in order to learn to play on reorganized fretboards (in just intonation). The idea was even taken from Schneider, as I have cited before: “[w]ith so many notes to choose from, cutting down the field lessens the chance of error and when other pieces demanded other notes, frets were simply added or taken away.”<sup>248</sup> On the other hand, at times arrive large jumps from one note to another. Ideally, with every new piece of Partch to learn extra fretlets can be added or removed on this guitar. Each time the fretboard of the guitar will then be organized according to the ratios of a composition of Partch.

The beauty of the fretlets lies in the fact that they can always be removed or added. Therefore, this guitar can be a continuous work in progress. Each composition means other ratios that can be added to the guitar. This way of preparing, moreover, reminds of Partch’s philosophy of instrument

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<sup>248</sup> Schneider (Regenesis: 6).

building that the idea for an instrument always goes together with a specific composition. I therefore termed this guitar exclusively for Partch's music 'the Adapted Classical Guitar'. The fretboard of the 'Adapted Classical Guitar' can eventually be organized into an entire just intonated fretboard of Partch's Adapted Guitar I (see Figure 23). What is more is the possibility to compose new music for Partch's guitar.

The notation of the Adapted Classical Guitar is in a special tablature that needs some explanation. The reference point is a complete overview of the ratios available on the Adapted Classical Guitar – in order to play the works *The Letter* and the second *Study on Archytas's Enharmonic*. The numbers on the upper horizontal line correspond with the numbers written in the tablature, and they refer to the positions of the ratios and their frets. The vertical line represents the order of strings of the ACG (see appendix for overview).

To sum up, the tablature of the ACG in *The Letter* works as a standard tablature with numbers indicating the frets, but the frets on this fretboard are in unequal divisions and appear randomly. Partch had made his tablature similar to this principle of having numbers on staves that represent specific ratios (see the notation of the Harmonic Canon in the *Two Studies* §5.1). Each number in this specific tablature corresponds with a ratio and its fret, and goes as follows: 0 = open string, 1 = first fret position that one encounters on the given string, 2 = second fret on the given string etcetera. The numbers are taken from the overview Tuning Chart above. Consequently, the musician needs to thoroughly study the overview. Next the numbers are notated - according to Partch's tablature of his AG – on three lines that represent the strings from high to low: B G Eb. Finally, the rhythm is notated above, in this case tremolo single notes and a chord in the third measure.

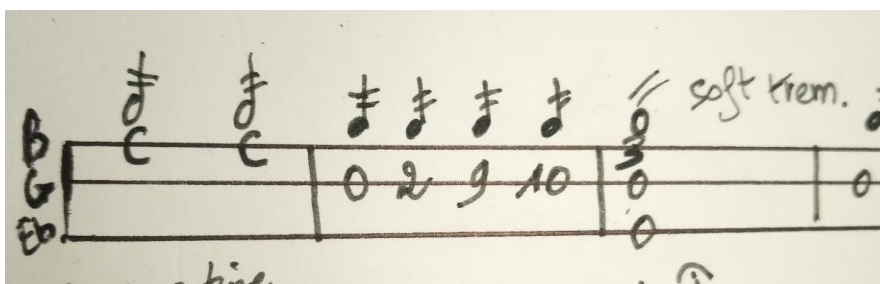


Figure 29 Tablature of the Adapted Classical Guitar in *The Letter* for Classical Guitars

The example above from the classical guitar tab (part Adapted Guitar I) of *The Letter* is read as two 2/1 ratios in the first bar (C meaning the fretless part above the XII fret), then they are played as



#### 4.2.3.1 Technique

- In the Kithara part for two guitars the changes between the guitars (one flat on a table, the other in standard position) and the slide vibrations with gleitstahl need some attention and practice. Nevertheless, I experienced a very quick learning process of the musician who played this offbeat part, because in fact the parts keep repeating themselves.
- In the part of the ACG the tremolo techniques might be revised. In the teaser video it becomes clear that a classical tremolo technique of p-a-m-i or p-m-i as described in §4.2.1 is not always strong enough. In the future alternative techniques can be tried: or with fast movements with a plectrum, just like Partch's AG (but then without having a doubling of the strings Eb – G – B), or with fast rasguados as well for the chords as for the single notes and glides.
- Playing the ACG is not always easy because the amount of frets is small, but the gaps on the fretboard are large. Therefore some passages with big jumps of the fingers become precarious. Also, some frets are positioned close to each other which means that small fingers are an advantage here.
- Finally, it is important to have an understanding of the rhythm and the changes of metrum. The rhythmic pulse is what holds everything together especially the rhythms of the speaking voice. In the solo version it is however more difficult to keep the tempo than when the Kithara part supports the piece.

#### 4.2.3.2 The voice

- A nice, warm voice is required that speaks sometimes monotonous – but not like a robot's voice – then at once theatrical and expressive. The sound is as organically as possible and tries to keep the subtle and sudden flexions of a speaking's voice.

#### 4.2.3.3 Interpretation

- While the voice recites the text loud and clear, the arpeggios on the guitar that is flat on the table become like a drone. Furthermore the arpeggios sound only softly on the background. The Adapted Classical Guitar also has light tremolos while the voice is present. These parts are therefore very meditative, while the intermezzos without the voice have unexpected fortissimos, and expressive slides and glissandos. The tremolos become heavy and the chords are strummed aggressively when the voice is absent. This contrast between parts creates the main absurd character of the piece. After the glides of the AG part have gone up to the upper G a fade-out of the tremolos creates a nice ending of the expressive intermezzo. In fact, every time the instrumental intermezzo finishes, it is advised to have kind of a pause because there is always a stylistic break from one part to another. The opposing parts can be interpreted metaphorically so that the instrumental parts mirror the inner emotional reaction of the reader who first reads the letter and then responds to what he or she has read and then finally after reacting out of control, comes back to his or her senses.
- As mentioned previously, for an interpretation of Partch the primitive sounds are fundamental. In general the musician does not need to look for dramatic crescendo's or contrasts created by dynamics, but needs to be more aware of the hypnotizing rhythms,

flowing intonations of the voice, slides of the guitars and the expressive accents of the instruments.

- Even though there is indicated for the arpeggios in the intermezzos of the Kithara part to alternate the sound of the strumming 'flesh' and 'nail', playing only 'nail' gave a more fuller sound closer to Partch's Kithara's sound.

## 5 Arranging Two Studies on Ancient Greek Scales

*Two Studies on Ancient Greek Scales* were written in 1946 for solo Harmonic Canon. The new Bass Marimba was added later in 1949.<sup>251</sup> These studies became the instrumental preludes of nine more compositions – of which eight with voice and one instrumental postlude – composed between August 1949 and December 1950. All were cycled together as *Eleven Intrusions*. They are ordered as follows: *Study on Olympus' Pentatonic*, *Study on Archytas' Enharmonic*, *The Rose*, *The Crane*, *The Wind*, *The Waterfall*, *The Letter*, *The Street*, *Vanity*, *Lover*, *Soldiers/War/Another War*, and *Chamber Music*. *Three Intrusions* (1949) are the first compositions to have Partch's Bass Marimba and the Adapted Guitar II.<sup>252</sup> *Two Studies* are really accessible in terms of intonation to a western audience. Partch gradually moves on to stranger sounds though in the following pieces with voice as heard in for example *The Rose* and *The Crane*. While in the *Two Studies* he plays Greek just intonated scales that consist of only two tones from the 11-limit, in the pieces that follow he really explores new dissonances of microtones that sound strange to western ears.

With only just intonated tones from the 3- and 5-limit it seemed rather transparent how to arrange the first modal *Study on a Pentatonic Scale* for two guitars. the ratios can all be reduced to tones found on standard frets of a classical guitar. Beware though, this arrangement is set for playing on a standard classical guitar and is therefore not loyal to Partch's theory of intonation. *The Studies* for Harmonic Canon and Bass Marimba have a very compelling sound, also in the many arrangements by contemporaries for instruments that differ from Partch's originals, such as Johnston's string quartet arrangement.<sup>253</sup> Nevertheless it could be interesting to create an arrangement for two guitars with a sound imitating the primitive timbres of Partch's instruments and to insert objects that manipulate the guitar sound. I experimented with the timbre by adding objects to the guitar (see further §5.2.3). Finally, I had to look for good fingerings for how to easily play the fast embellishments in the second part of the piece (see Appendix §10.4).

*Study on Archytas' Enharmonic* has two tones  $28/27$  and  $14/9$  in its scale from the 11-limit that are not available on a standard guitar. The first idea was to look for scordatura, but another solution came up after rearranging the frets of my old classical guitar for the 11-limit ratios from *The Letter*.

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<sup>251</sup> Partch (1979: 490); Silverman, "Preface", Accessed on 12 November 2019  
<https://forum.makemusic.com/attach.aspx/6229/Partch.pdf>

<sup>252</sup> Schneider (2004: 43).

<sup>253</sup> See also for an example of a magical arrangement Dean Drummond's *Two Studies on Ancient Greek Scales* for flute and Zoomoosophone (1990).

Two extra frets for the ratios 28/27 (Ab-) and 14/9 (Eb-) were added on the Adapted Classical Guitar (see §4.2.1.2 for the general overview of the frets of the ACG).

## 5.1 Analysis of the Sheet Music

Much of the history of intonation is ascribed to the Ancient Greeks.<sup>254</sup> The *Two Studies* are based on historical Greek scales. Just intonation was already considered by Pythagoras of Samos ca. 500 B.C. by terms of string division (idea of the monochord).<sup>255</sup> Therefore, Partch's ancient Greek studies are his homage to the Greek theorists. The first study is in a pentatonic scale. There are various pentatonic scales in ancient Greek culture, such as the Pythagorean, but also ancient Chinese music.<sup>256</sup> The pentatonic scale in the first study is Olympos' scale (a flutist and lyre player, sixth century B.C) who was called the father of Greek music, and the scale (descending) referred to is a G-minor pentatonic with the ratios: 9/8 - 1/1 - 8/5 - 3/2 - 6/5 - 9/8 or 9/8 - 5/4 - 16/15 - 5/4 - 16/15.<sup>257</sup>

*Archytas Enharmonic* is a tetrachord scale by the Greek philosopher Archytas (4<sup>th</sup> century B.C.). The heptatonic scale of two tetrachords is separated by a tone. There are three types of ancient Greek genera: enharmonic, chromatic, diatonic. The enharmonic goes as follows: [1/1 (G) – 28/27 (Ab -) – 16/15 (Ab) – 4/3 (C)] and [3/2 (D) – 14/9 (Eb -) – 8/5 (Eb) - 2/1 (G)].<sup>258</sup> According to Partch the ratios 28/27 and 14/9 in Archytas' Enharmonic scale proof that the ancient Greeks already showed the theoretical acceptance of ratios within the 11-limit.

On the first page the tuning of the Harmonic Canon I is given:

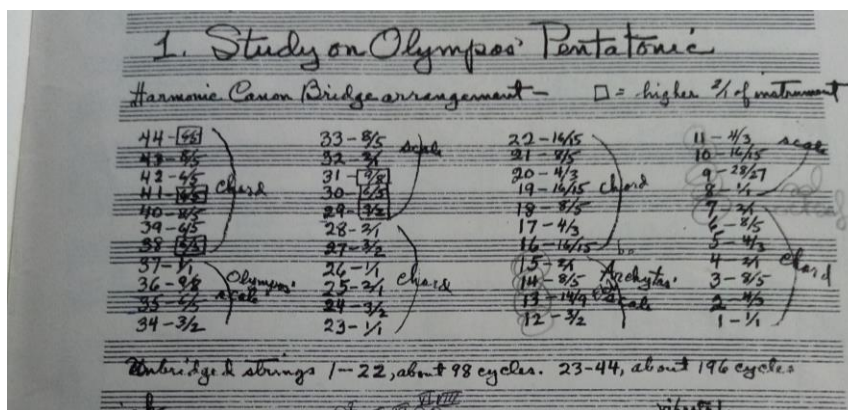


Figure 31 Tuning of Harmonic Canon I, Schott 2017

<sup>254</sup> See Partch, Harry, "PART FOUR. Intonations: Historic, Implied, Proposed", in: *Genesis of a Music*. 1979? 361-440.

<sup>255</sup> Partch (1979: 388).

<sup>256</sup> Partch (1979: 103).

<sup>257</sup> Partch (1979: 177).

<sup>258</sup> Partch ((1979: 170).

Each ratio is accompanied by a number and these numbers return on the staves and represent the strings and their frequency ratio of the Harmonic Canon.<sup>259</sup>

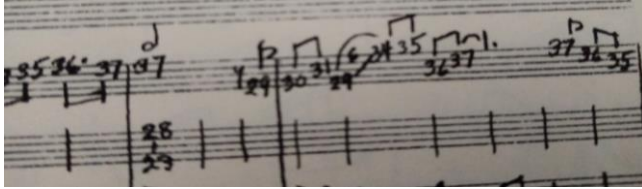


Figure 32 Harmonic Canon in Study on *Olympos' Pentatonic*, Schott 2017

After deciphering the numbers and ratios, the scales in western notation are:

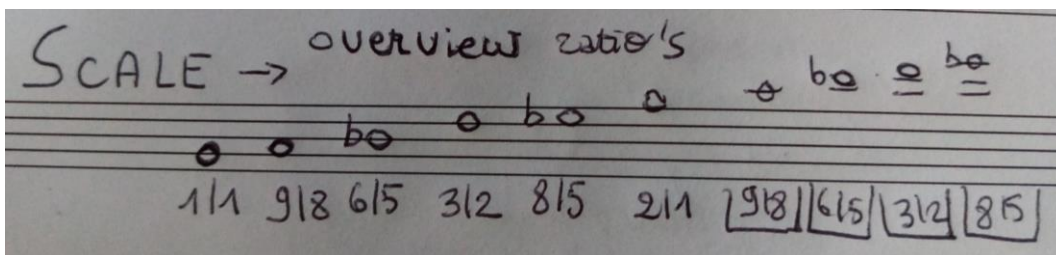


Figure 33 Pentatonic Scale with Ratios in Clef Key

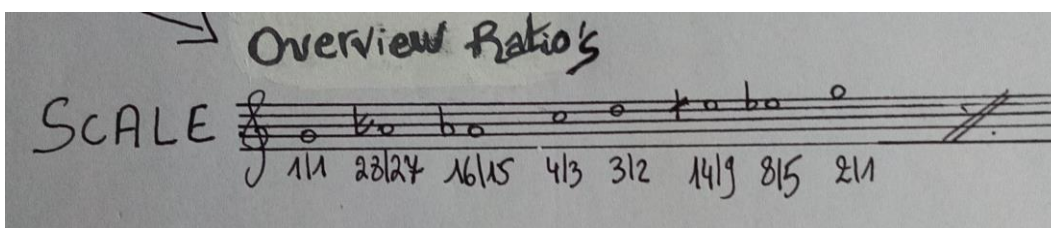


Figure 34 Archytas' Enharmonic Scale with Ratios in Clef Key

28/27 and 14/9 are the ratios from respectively the 11-limit and 7-limit, not found on a standard classical guitar. Indicated here in a clef key with Ellis-Helmholtz accidentals (see figure 2).

<sup>259</sup> Partch (1979: 240).

The Bass Marimba instead is written in a transparent notation of a bass key on staves. With only a few notes to take into consideration – this part only has four different pitches Bb G Eb A – this part can be played on a standard guitar’s open strings tuned according to these four pitches.

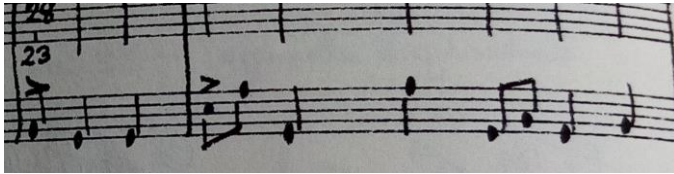


Figure 35 Bass Marimba part in *Olympos' Pentatonic*, Schott 2017

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The arrangement of the *Two Studies* for two guitars thus has one guitar that plays the leading part of the Harmonic Canon. The Guitar 2 plays the part of the Bass Marimba and functions as rhythmic accompaniment. It was also interesting to experiment with different timbres at both parts.

## 5.2 Preparing the Classical Guitar

As mentioned in Chapter 3 the sound of the traditional instrument can be manipulated by preparations. First, I looked for a scordatura of the guitars that suited the different parts of the *Studies*. Next, different timbres were sought to match the sound of Partch’s instruments by adding different objects to the strings. Finally, I came up with a notation for these prepared guitars.

The second *Study on Archytas' Enharmonic* is played on the re-fretted classical guitar from *The Letter* and then notated in a similar tab as *The Letter*.

### 5.2.1 Scordatura

The repetitive basses of the transcribed Bass Marimba part create a hypnotic effect that is caused by open tunings. In the *Two Studies* only the basses of the guitars are retuned – apart from the tuning of the ACG for the Harmonic Canon part in *Archytas' Enharmonic*. Guitar 2 that has the part of the Bass Marimba only plays the four lowest strings that are in scordatura as the bass accompaniment.

#### 5.2.1.1 The Pentatonic scale

The melodious part of the Harmonic Canon can have a guitar in standard tuning of the upper strings, and also scordatura of the basses for the drone effect. The Bass Marimba part as said before needs a guitar in scordatura for the basses.

*Harmonic Canon part transcribed for Classical Guitar*

This guitar part was decided on following scordatura:

Table 16 Scordatura of Guitar 1 in *Pentatonic Scale*

① E-string	E
② B-string	B
③ G-string	G
④ D-string	D
⑤ A-string up to:	B $\flat$
⑥ E-string up to:	G

The notation of Guitar 1 is on staves in a clef key. The repetition of the quarter beats B $\flat$  and G in the Harmonic Canon part creates a drone accompaniment. The difficulty for Guitar 1 is the fast succession of notes, for the first time encountered in measure 6. For the Harmonic Canon it was not difficult to play these little variations on the scale because it has the open strings ready to strum. Instead, the classical guitar needs accurate fingerings to do these virtuosic measures. Also, the musician can vary with the time through *rallentando* and *accelerando* while playing these measures.

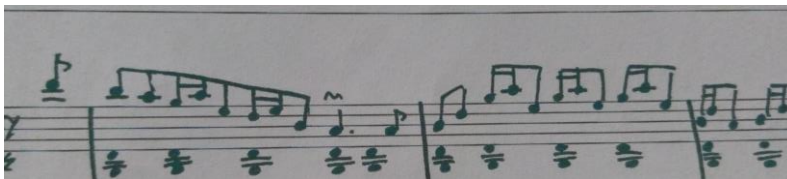


Figure 36 Tablature of Guitar 1 in *Olympos' Pentatonic* for Classical Guitars

Due to the fact that this study is played on a standard classical guitar, there is a clash with just intonation. Nevertheless, the deviation in cents is very small, and in any case this arrangement allows standard guitars to play a piece by Partch without much preparation time. The deviation for

9/8 'Standard A' is + 1.3 cents; for 6/5 'Standard Bb' + 15 cents; for 3/2 'Standard D' + 2 cents; and 8/5 'Standard Eb' + 13.7 cents.

*Bass Marimba part transcribed for a Classical Guitar*

Table 17 Scordatura of Guitar 2 in *Pentatonic Scale*

③ G-string up to:	<b>A</b>
④ D-string up to:	<b>E<sub>b</sub></b>
⑤ A-string up to:	<b>B<sub>b</sub></b>
⑥ E-string up to:	<b>G</b>

In the tablature of Guitar 2 the staves represent these exact strings from high to low. To know which string to play and in which rhythm, it is indicated by the notes written on the lines. Only open strings are played therefore these tablatures guide the musician in terms of rhythm and for playing the open strings.

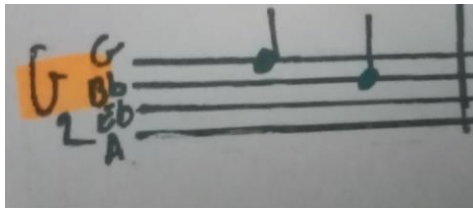


Figure 37 Tablature of Guitar 2 in *Olympos' Pentatonic* arranged for Classical Guitars. Interpretation of this measure: the musician plays open strings G and Bb quarter beats.

5.2.1.2 For Archytas' Enharmonic scale

The same idea of scordatura goes for the transcribed Bass Marimba part in the *Study on Archytas' Enharmonic*. Something else is the change of guitars for the Harmonic Canon part from a standard classical guitar to an Adapted Classical Guitar.

*Harmonic Canon part transcribed for Adapted Classical Guitar*

See §5.2.2 for the Adapted Classical Guitar

*Bass Marimba part transcribed for Classical Guitar's open strings*

Table 18 Scordatura for Guitar 2 in *Archytas' Enharmonic*

③ G-string	<b>G</b>
④ D-string up to:	<b>F</b>
⑤ A-string up to:	<b>Bb</b>
⑥ E-string down to:	<b>Eb</b>

Again the notation of Guitar 2 is in a specific tablature as seen in Figure 38. The staves represent the four strings from low to high. For the remainder the notes are written as usual in the right rhythm.

5.2.2 Adapted Classical Guitar in the *Study on Archytas' Enharmonic*

The Adapted Classical Guitar exerts its reorganized frets for transcription of the Harmonic Canon in *Study on Archytas' Enharmonic*.

The tablature of the ACG in *Study on Archytas' Enharmonic* has five lines instead of the three lines from the ACG tablature of *The Letter* because the basses Ab and G are included here. They are open basses indicated by a zero '0'. From high to low the lines represent Eb G B Ab G.

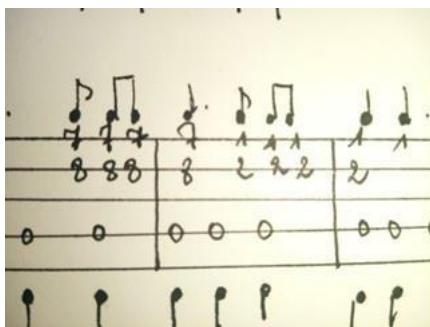


Figure 38 Tablature of the Adapted Classical Guitar in *Archytas' Enharmonic* arranged for Classical Guitars

The example of the tablature in Figure 39 is interpreted as follows: the first bar has three eighth notes of ratio 2/1 ('7' or the seventh fret on the B-string) and 8/5 ('8' or a finger at the eighth fret on the G-string), and so on. At the same time, a repetitive Ab bass accompanies the melody ('0' on the fourth line).

### 5.2.3 Objects

At the beginning of the paper it was proposed to create interesting timbres on the guitar that imitate the sounds of Partch's instruments. In *The Letter* there were the typical glides and vibratos with the gleitstahl on the guitars that made the sound more Partch-like. Also, the tremolos on the ACG were played more ponticello to imitate the metal timbre of Partch's AG I. Anyway, in *The Letter* there had been no further experiments with objects attached to the strings. *The Two Studies* instead are not as complex in voicing, tonality, etcetera, in comparison with *The Letter*. So various objects can be tried out. The strings of the original Harmonic Canon give out metal sounds that almost sounds like a Harpsichord, but then with less rattle. To evoke the marimba sound of the Guitar 2 preparations that creates percussive sounds and at the same time that imitate the marimba's mellow, yet dark sound can be added. So no rattle sounds created like for example crossed-strings technique seem suitable in this case.

After experimenting with different objects on the guitar the sound of the Harmonic Canon can be recreated with a ruler of fifteen centimetres attached on a four-centimetre distance from the guitar bridge, with its third and fifth string above the ruler and the other four strings under it. This preparation had the best result. The only problem were some uncontrollable rattles of open strings. To create a clear sound it is advised to use a smooth ruler. One can also try to completely move the object to the right so that it is next to the bridge. Finally, the right hand then needs to search for the best timbre by moving around the sound hole (sul tasto and sul ponticello). I found that the sound right above the sound hole and the ponticello had a nice sound.<sup>260</sup>

Other objects that created interesting sounds:

- I had first tried a ruler of twenty centimetres length. This ruler was made of more flexible material which made the buzzes intolerably overpowering. Furthermore, the intonation was less clear than with the 15 cm-ruler.<sup>261</sup>
- Paperclips also create beautiful overtones and gongs. But they are not very stable and can easily drop from the strings while performing. More importantly, the intonation of the strings is disturbed and

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<sup>260</sup> See video of this preparation of Guitar 1 in *Study on Olympos' Pentatonic*: <https://youtu.be/zh2mvYgsNr4>.

<sup>261</sup> See video of this preparation of Guitar 1 in *Study on Olympos' Pentatonic*: [https://youtu.be/yeQg\\_I9I8f0](https://youtu.be/yeQg_I9I8f0).

then it becomes difficult to control the resulting sounds. There are too many overtones to have a clear sound. Nevertheless, the gong-sound is quite extraordinary.<sup>262</sup>

- A credit card creates a similar effect as the fifteen centimetre ruler. But it is less stable because of its form (not long enough). And it mutes the sound of the strings more strongly.
- Paper at the bridge sounded too dull and muted, and only a percussive effect was created with it.

For the Guitar 2 I positioned another third bridge only a few centimetres from the regular bridge under the strings, the strings are then shortened, and the sound effects are percussive. The best sound came from a sponge under the strings, at four-centimetre distance from the bidge. The resulting sound was warm, muted and also percussive. The downside of the sponge is that resonance is lost, the notes can simply not last very long. In fact, the sonority of the marimba is not imitated, but indeed the idea of mellowness is. The idea of a string instrument's pizzicato's comes to mind as well.<sup>263</sup>

Other objects that created interesting sounds:

- Cloth and paper towel is woven over and under the strings close to the bridge or 5 cm from the bridge and brought out overtones and a mute effect, so also here resonance is lost. When adding tinfoil, the resulting rattles were quite unnecessary for this part.<sup>264</sup>
- I also tried hammering the strings with chopsticks and one 0.3 mm pen. Unfortunately, hitting the strings with these attributes was difficult because they are positioned so close to each other. It is easy to miss the right string. Nevertheless, it is quite an interesting percussive effect, visual - and sound-wise.<sup>265</sup>

A final remark for these preparations is that they create a damped, much quieter sound of the classical guitar, so amplification could be used to increase its volume.

#### 5.2.4 Points of Attention for Performance

Note that in the videos of my arrangements<sup>266</sup> a ruler is not attached at the bridge of the guitar for the Harmonic Canon part while the Guitar 2 for the Bass Marimba part has a sponge under the bridge.

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<sup>262</sup> See video of this preparation with paperclips of Guitar 1 in *Study on Olympos' Pentatonic*: <https://youtu.be/JphNvDrfWRg>.

<sup>263</sup> See video of this preparation of Guitar 2 in *Study on Olympos' Pentatonic*: <https://youtu.be/ZgypMLHI-80>.

<sup>264</sup> See video of this preparation of Guitar 2 in *Study on Olympos' Pentatonic*: <https://youtu.be/KvOiz6LskJc>.

<sup>265</sup> See video of this preparation of Guitar 2 in *Study on Olympos' Pentatonic*: <https://youtu.be/0stZ37dTzWU>.

<sup>266</sup> For an impression of my guitar arrangements of the *Two Studies on Ancient Greek Scales*, see the video links: *Olympos' Pentatonic*, <https://youtu.be/Vor17Q4kYxU>; *Archytas' Enharmonic*, <https://youtu.be/8D0up8fAC8c>

#### 5.2.4.1 Technique

- The fast embellishments in the Guitar 1 part are very tricky in both studies and need good fingerings and practicing (for the fingerings see music sheet).
- For the duo it is important that Guitar 1 follows Guitar 2 that functions as a metronome – not a noisy penetrating, but a soft one.

#### 5.2.4.2 Preparations

- It is necessary for Guitar 2 to have a different sound from Guitar 1 for reasons of contrast and combination of timbres. Without preparations also a pizzicato with the right hand damping at the bridge could do the job. The sponge however works really well and is stable.
- The goal is to have the part of guitar 1 of the *Study on Olympos' Pentatonic* also arranged for an Adapted Classical Guitar in the future.

#### 5.2.4.3 Interpretation

- The music is very intimate and hypnotizing, so the warm sound of the first classical guitar suits the music. Then again, the primitive sound of Partch is not actively imitated. It could be a matter of taste or even principle to decide to include object preparations for timbre or not.
- The sound of Guitar 2 with the sponge in the arrangement reminds of the pizzicatos from the string quartet arrangement of Johnston.
- At the part of the Harmonic Canon for both *Studies* it is tempting to play vibratos all the time, but they must be reduced to the amount of vibratos that are specifically indicated by Partch on the score. These vibratos sul ponticello create a sound that is reminiscent of the Harmonic Canon.
- The musical phrases are obvious because the pieces are modal and the melody is based on the Greek scales that go up and down. Here, the G still has the function of a tonic and so the musical phrases always end or start here. The extra tension in the Archytas' Enharmonic is created with the enharmonic tones ( $16/15$  and  $28/27$ ;  $14/7$  and  $8/5$ ). So the performer can emphasize these tones by changing subtly the timbre (right hand) or playing sudden fortes or pianos. For the remainder, the music is straightforward as is the playing.
- Because the music's flows is what triggers the listener Guitar 2 must stay in tempo at all times while Guitar 1 can play rubato for the embellishments in both *Studies*. In the second *Study* the musician must look even more for the rocking effect of the triplets to accompany the Guitar 1. Giving subtle accents on each beat to distinguish the triplets might create this rocking feeling.

## 6 Conclusion

In general, rearranging the fretboard with fretlets according to the ratios from Partch's compositions is a very solid way for playing his music on a classical guitar. If not a rearranged fretboard, there exist alternative solutions like scordatura, but they can get far-fetched and the result more limited than with fretlets. In the case of *The Letter*, I even transcribed the Kithara part for two guitars in scordatura for only one musician. Some of tuning and restringing need some preparation time. Nevertheless, Partch's sound world can be brought to the classical guitar with modifications of the standard instruments, and the music can be performed as seen in the videos of my own performances and the music scores in the Appendix.

Admittedly, I have made compromises for just intonation and the guitars. In the process of the thesis I decided to only reorganize the fretboard of the Adapted Classical Guitar according to Partch's 7- and 11-limit ratios and to keep the small number ratios of the 3-limit and 5-limit on equal tempered frets. This means that I have not yet reorganized the fretboard entirely according to Partch's forty-three just intonated ratios. There are two reasons for this choice:

1) I initially wanted to have music of Partch directly available on standard classical guitars. Seeing the fact that the cents' deviation with 3-limit and 5-limit ratios is very little so that the 12 TET-frets approach the pitches in just intonation. Musicians with standard instruments could then discover Partch's mysterious music and at the same time discover alternative ways of playing their instruments. For example, a composition with small number ratios such as the *Study on Olympos' Pentatonic* can be arranged directly for an unaltered classical 12-TET guitar. Still that would not go for arranging Partch's other compositions in just intonation.

2) When learning to play microtonal fingerboards such as the ACG, a little amount of new fret positions allows the musician to memorize the positions easily. Then, new frets can be added gradually for every other composition of Partch.

Partch's scholars might disapprove this compromise, but I must emphasize that this Adapted Classical Guitar is a work in progress. In the future its fretboard can be organized entirely according to the fretboards of Partch's Adapted Guitars, also with frets for the ratios from the 3-limit and 5-limit. The classical guitars in scordatura (of the Kithara part) additionally started off as an experiment that turned out to work well. I have also experimented with different timbres by preparing the guitar with objects in the *Two Studies*. On the score though is written that the performer of the leading voice can decide to have the objects added or left out. The question is how close the sound needs to stay to the primitive sound of Partch's instruments or if a classical guitar sound is allowed.

The notation of the arrangements are most of the time purely visual. They are blueprints that show the positions on the fretboard or indicate which open strings to play. Of course I could have opted for a western notation with different accidentals, but I preferred to follow Partch's way of different tablatures for each individual instrument. In fact, these tablatures make playing in different intonation less confusing. Even though at the beginning the musician needs to study the different notations well, afterwards the reading becomes the easy part. When the ACG in the future will be made entirely just intonated with fretlets, its tablature will change with it to describe all positions (numbers can then be added: horizontally the order of the opens strings. Vertically the position of the frets in numbers). In any case, Partch's music in the arrangements is kept alive in terms of notation, sounds reminiscent of original instruments and instrument adaptations.

Finally, the methods of preparing the guitar described above were used in the two compositions *The Letter* and the *Two Studies* and resulted in arrangements and tablatures that are found attached (see Appendix and attachments for scores of the arrangements).

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## 8 List of Abbreviations

12-TET	12 tone equal tempered
AG	Adapted Guitar
ACG	Adapted Classical Guitar
Ibid.	Ibidem “in the same place” similar to idem. Used to indicate that the source is the same as the previous cited one.
ET	Equal Temperament
Jl	Just Intonation
N.N.	No name, without author
s.d.	No date

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## 9.4 Sheet Music

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## 10 Appendix

The appendix includes the formula for calculating the fret positions according to the ratios of Partch's composition, and the calculations for each ratio, then also a summary of the preparations and different tunings of each part.

### 10.1 Calculations Fret Positions

The distance (in centimetres) that is found, goes from the nut unto the specific position on the fretboard at the height of a given string.

#### **Formula:**

On a 1/1 string:

First you flip the ratio you need to find and then you apply next:

$$[1/1] - [\text{given ratio}] = x$$

$$[x] \times [\text{guitar length}] \text{ cm} = \text{distance}$$

On the other strings:

First you flip the ratio you need to find and then you apply next

$$[\text{open string}] \times [\text{given ratio}] = x$$

$$1/1 - x = y$$

$$[x] \times [\text{guitar length}] \text{ cm} = \text{distance}$$

If a given ratio crosses the 1/1 octave, the higher number of the given ratio is doubled in the formula.

\*/\*\*

Indicate the same distance for two ratios so that a longer fret can be used to glue on the fretboard.

**(TWO STUDIES)**

The frets that are installed specifically for performance of the *Study on Archytas' Enharmonic*.

Ratio	String	Formula
<b>*7/4</b>	<b>5/4</b>	$5/4 \times 4/7 = 20/28$ $28/28 - 20/28 = 8/28$ $8/28 \times 65 = \mathbf{18.57 \text{ cm}}$
<b>12/7</b>	<b>5/4</b>	$5/4 \times 4/7 = 35/48$ $48/48 - 35/48 = 13/48$ $13/48 \times 65 = \mathbf{17.6 \text{ cm}}$
<b>20/11</b>	<b>5/4</b>	$5/4 \times 11/20 = 55/80$ $80/80 - 55/80 = 25/80$ $25/80 \times 65 = \mathbf{20.3 \text{ cm}}$
<b>*7/5</b>	<b>1/1</b>	$1/1 - 5/7 = 2/7$ $2/7 \times 65 = \mathbf{18.57 \text{ cm}}$
<b>**10/7</b>	<b>1/1</b>	$1/1 - 7/10 = 3/10$ $3/10 \times 65 = \mathbf{19.5 \text{ cm}}$
<b>28/27</b> <b>(TWO STUDIES)</b>	<b>1/1</b>	$1/1 - 27/28 = 1/28$ $1/28 \times 65 = \mathbf{2.32 \text{ cm}}$
<b>15/8</b>	<b>1/1</b>	$1/1 - 8/15 = 7/15$ $7/15 \times 65 = \mathbf{30.33 \text{ cm}}$
<b>14/9</b>	<b>1/1</b>	$1/1 - 9/14 = 5/14$

<b>(TWO STUDIES)</b>		$5/14 \times 65 = \mathbf{23.21 \text{ cm}}$
<b>7/6</b>	<b>8/5</b>	$8/5 \times 6/(7 \times 2) = 8/5 \times 6/14 = 48/70$ $70/70 - 48/70 = 22/70$ $22/70 \times 65 = \mathbf{20.42 \text{ cm}}$
<b>**8/7</b>	<b>8/5</b>	$8/5 \times 7/(8 \times 2) = 56/80$ $80/80 - 56/80 = 24/80$ $3/10 \times 65 = \mathbf{19.5 \text{ cm}}$
<b>12/11</b>	<b>8/5</b>	$8/5 \times 11/12 = 88/120$ $120/120 - 88/120 = 32/120$ $32/120 \times 65 = \mathbf{17.33 \text{ cm}}$
<b>9/5</b>	<b>8/5</b>	$8/5 \times 5/(9 \times 2) = 8/5 \times 5/18 = 40/90$ $90/90 - 40/90 = 50/90$ $50/90 \times 65 = \mathbf{7.22 \text{ cm}}$

## 10.2 Complete Overview of Ratios for Tablature of ACG

### Legend:

Horizontal line	The frets available on the specific strings from left to right ('1' being the first fret on the neck starting from the left). These are the frets needed in the compositions <i>The Letter</i> and <i>Study on Archytas's Enharmonic</i> .
0	Open string
1-10	sequence of frets until the standard XII fret
A, B and C	Tones above the XII fret (played fretless), the octave above 12/7 and 7/4 and 2/1

Vertical line                      The tuning of each string, starting from the B-string (the upper E-string is left out)

I / II / III / VIII / XII              Standard frets, and therefore not just intonated. There is a deviation of a few cents. When these are not notated between brackets and there is no ratio extra (for example 3/2 (III)) then they do not feature in one of the compositions, but they are present on the fretboard however.

\*                      Tones solely from *Study on Archytas's Enharmonic*, not from *The Letter* (in fact, the fifth string is best removed for a performance of *The Letter*, yet the sixth can be maintained and tuned to G)

\*\*                      Tones that occur both in *Study on Archytas's Enharmonic* and in *The Letter*

	0	1	2	3	4	5	6	7	8	9	10	A	B	C
5/4 B-String	0	*4/3 (I)	II	**3 /2 (III)	12/ 7	7/4	20/1 1	**1/ 1 (VIII)	XII	/	/	12 /7	7/ 4	2/ 1
1/1 G-String	0	*28/ 27	**16/ 15 (I)	II	6/5 (III)	7/5	10/7	*14/ 9	*8/ 5 (VII I)	15/ 8	XII	/	/	
8/5 D-String Tuned to Eb	0	I	II	9/5	1/1 (IV)	12/ 11	8/7	7/6	VIII	XII	/	2/ 1	/	
9/8 A-String Tuned to Ab 16/15	*0	/	/	/	/	/	/	/	/	/	/			

8/5	*0	/	/	/	/	/	/	/	/	/	/			
lowest E-String Tuned to G 1/1														

### 10.3 Summary of Preparations and Tunings in the Arrangements

The scordatura with different preparations for each voice in each arrangement, are summarized here:

#### *The Letter*

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#### **Adapted Guitar I transcribed for Adapted Classical Guitar**

For solo and duo guitar:

② B-string	<b>B</b>
③ G-string	<b>G</b>
④ D-string up to:	<b>E<sub>b</sub></b>

#### **Adapted Guitar I transcribed for two Classical Guitars in Scordatura:**

Guitar 1:

① E-string tuned up:	15/8	367 Hz
② B-string	5/4	246 Hz
③ G-string	1/1	197 Hz
④ D-string tuned to E <sub>b</sub>	8/5	155 Hz

⑤ E-string tuned up to	7/4	397 Hz
⑥ E-string tuned up to	12/7	336 Hz

Guitar 2:

① E-string tuned up:	20/11	356 Hz
② B-string	12/11	213 Hz
③ G-string	1/1	<b>196</b>

### Kithara transcribed for two Classical Guitars in Scordatura

Guitar 1:

① E-string down to:	<b>7/4</b>	171 Hz
② E-string down to:	<b>12/7</b>	168 Hz
③ B-string up to:	<b>7/5</b>	129 Hz
④ B-string up to:	<b>10/7</b>	139 Hz
⑤ B-string down to:	<b>7/6</b>	114 Hz
⑥ B-string down to:	<b>8/7</b>	111 Hz

Guitar 2:

① E-string down to:	<b>3/2</b>	293 Hz
② B-string down to:	<b>6/5</b>	226 Hz
③ G-string	<b>1/1</b>	196 Hz
④ D-string up to:	<b>12/7</b>	168 Hz
⑤ A-string down to:	<b>3/2</b>	73 Hz

⑥ A-string down to	<b>6/5</b>	59 Hz
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*Two Studies on Ancient Greek Scales*

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**Harmonic Canon transcribed for a Classical Guitar in Scordatura:**

Optionally, a ruler can be adjusted four centimetre from the bridge for a metally sound.

Guitar 1 in *Olympos' Pentatonic*:

① E-string	<b>E</b>
② B-string	<b>B</b>
③ G-string	<b>G</b>
④ D-string	<b>D</b>
⑤ A-string up to:	<b>Bb</b>
⑥ E-string up to:	<b>G</b>

Adapted Classical Guitar in *Archytas' Enharmonic*:

② B-string	<b>B</b>
③ G-string	<b>G</b>
④ D-string up to:	<b>Eb</b>
⑤ A-string down to:	<b>Ab</b>
⑥ E-string up to:	<b>G</b>

**Bass Marimba transcribed for Classical prepared Guitar**

A sponge of one-centimetre height is stuffed under the strings of four-centimetre distance from the bridge. Or else a paper towel is woven around the strings.

### Guitar 2 in *Olympos' Pentatonic*

③ G-string up to:	<b>A</b>
④ D-string up to:	<b>E<sub>b</sub></b>
⑤ A-string up to:	<b>B<sub>b</sub></b>
⑥ E-string up to:	<b>G</b>

### Guitar 2 in *Archytas' Enharmonic*

③ G-string	<b>G</b>
④ D-string up to:	<b>F</b>
⑤ A-string up to:	<b>B<sub>b</sub></b>
⑥ E-string down to:	<b>E<sub>b</sub></b>

## 10.4 Original Scores

The scores of the arrangements can be found attached in successive order:

- 1) *The Letter: A Depression Message from a Hobo Friend*
  - a. Partch, Harry, *The Letter A Depression Message from a Hobo Friend from "The Wayward" (1943/1955/1972)*, Mainz: Schott, 2018.
  - b. Partch Harry, *The Letter from Hobo Pablo*, Harry Partch Estate Archive, The Sousa Archives and Center for American Music, University of Illinois at Urbana-Champaign, 1943.
- 2) Partch, Harry, "Two Studies on an Ancient Greek Scales", in: *Eleven Intrusions for voices, choir and ensemble (1946-1950)*, Mainz: Schott, 2018.

## 10.5 The Arrangements' Scores

The scores of the arrangements can be found attached in successive order:

- 1) *The Letter: A Depression Message from a Hobo Friend*

- a. The text for the voice
  - b. Two classical guitars for the Kithara part
  - c. Two classical guitars for the Adapted Guitar part
  - d. The Adapted Classical Guitar for the Adapted Guitar Part
  - e. Solo Version of the Adapted Classical Guitar
- 2) *Two Studies on an Ancient Greek Scale*
- a. *Study on a Pentatonic Scale* for two guitars
  - b. *Study on Archytas' Enharmonic*: Harmonic Canon part transcribed for the Adapted Classical Guitar.
  - c. *Study on Archytas' Enharmonic*: Bass Marimba part transcribed for a prepared guitar
-