

**Seth F. Josel**  
**Ming Tsao**

**The Techniques of Guitar Playing**



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**Ming Tsao**

# **The Techniques of Guitar Playing**



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## Foreword

The “Techniques of Guitar Playing” by Seth F. Josel and Ming Tsao is a new instruction manual for guitarists wishing to improve their mastery of the variety of expressive means used in contemporary music and also for composers wanting to write for the guitar. The book is the result of a working project in artistic development with the title “The Guitar as a Vehicle for New Music Performance Practice” financed by the Faculty of Fine, Applied and Performing Arts at the University of Gothenburg.

This book is a fine illustration of the mission of the Academy of Music and Drama itself, balancing as it does in the borderlands between education and research. With courses at the basic level running parallel to advanced studies, development projects and research in several disciplines, the Academy offers a wealth of possibilities for motivating as well as inspiring the creation and practice of new art.

Seth F. Josel is an eminent guitarist with engagements in many countries and with contemporary

music as his hallmark. He has given first performances of more than one hundred works and collaborated with many composers. One of them is Ming Tsao, professor of composition at the Academy of Music and Drama and active as a composer in Europe and the United States. Their close collaboration has resulted in several new works for the guitar and now also in this instruction manual for the guitar.

As the Principal of the Academy of Music and Drama, my hope is that this new book will be distributed far and wide. It is an honor to contribute to a project resting on such fine foundations, a book that will indubitably give a great deal of joy to the guitarists and composers of our day.

Gothenburg, June 2013

Staffan Rydén  
Principal  
Academy of Music and Drama  
University of Gothenburg



## Preface

Instrumento admirable, tan sobrio como rico, que áspera o duclemente se adueña del espíritu, y en el que andando el tiempo se concentran los valores esenciales de nobles instrumentos caducados cuya herencia recoge sin pérdida de su propio carácter, de aquel que debe al pueblo por su origen.

This admirable instrument, both sober and sumptuous, seizes the soul sometimes roughly yet sometimes sweetly, having absorbed the essential values of noble bygone instruments whose heritage takes shelter—with no loss of individual character—in the people itself. How can one deny that the guitar, among all plucked-fretted stringed instruments, is the richest and most complete in its harmonic and polyphonic possibilities?

*Manuel De Falla, preface to Emilio Pujol's  
"Escuela Razonada de la Guitarra" (translation Christopher Williams)*

The earliest known music for the six-stringed instrument now commonly referred to as the classical guitar was composed in the mid- to late eighteenth century. Guitar music from this period survives in method books such as Federico Moretti's *Principj per la chitarra*, written in 1792.

In the nineteenth century guitarists and composers passionately explored the instrument's nearly boundless potential. Dionisio Aguado dedicates a whole chapter in his *Nuevo método para guitarra* (1837) to the "richness of the guitar" in which he explores the multitudinous timbral possibilities of the instrument: natural and artificial harmonics, vibrato to extend the duration of notes, sounds produced with the left hand only, muffled sounds, sounds imitating an ensemble of violin, viola, and bass (i.e., three-part writing), differences in timbre between different strings and playing with or without fingernails, and even sounds analogous to little bells.<sup>1</sup> Aguado indicates further how "with some degree of propriety the guitar can mimic certain instruments," and proceeds to describe how to approximate the sound

of a drum, a trumpet, or a harp.<sup>2</sup> Similarly, in his edition of the guitar method book by Fernando Sor published some years later, Napoléon Coste (1805–83), describes how the guitarist can imitate a horn, a trumpet, an oboe, or a harp.<sup>3</sup>

One of the great innovative orchestrators of the nineteenth century, who in many ways revolutionized the orchestra, was Hector Berlioz, a guitarist. Berlioz included the guitar in such compositions as *Huit Scènes de Faust*, *Benvenuto Cellini*, *Beatrice et Benedict*, and *Roméo et Juliet*. His contemporary Robert Schumann was sufficiently impressed with the guitar that he intended to use it in the "Romanze" of his fourth symphony (1841 version).<sup>4</sup>

The history of twentieth century literature for the classical guitar is as rich as it is diverse. Since the 1920s, the guitar has served an array of very different artistic purposes: composers have employed it (a) to contribute to a particular *Klangfarbe* as in Anton Webern's op. 10; (b) to evoke a folk atmosphere as in Arnold Schönberg's *Serenade*, the "Nachtmusik II" of Gustav Mahler's *7. Sinfonie*,

1 Aguado, *Nuevo método para guitarra*, 42 ff.

2 *ibid.*, 48.

3 Sor, *Méthode pour la guitare*, 14–16.

4 Manuscript facsimile courtesy of the Gesellschaft der Musikfreunde in Wien.

or the *Bühnenmusik* of Alban Berg's *Wozzeck*; (c) to explore the instrument's sound spectrum as in Manuel De Falla's *Homenaje pour le Tombeau de Claude Debussy* and Heitor Villa-Lobos's *Douze Etudes*; and (d) to provide a platform for experimentation (particularly with regard to various tunings) as in early works by Harry Partch and Percy Grainger.

The guitar continues to feature in contemporary works, taking a range of roles in a variety of settings: (a) it produces the very precise "plucked string" timbre integral to the serial or serial-influenced compositions of Pierre Boulez (*Le Marteau sans Maître*), Karlheinz Stockhausen (*Gruppen*), Henri Pousseur (*Libericare*), Karel Goeyvaerts (*Nr. 6*) and Milton Babbitt (*Sheer Pluck*); (b) it performs as an equal contributor to the polyphony of the ensemble in works by Elliott Carter (*Syringa*) and Jean Barraqué (*Concerto*); (c) it becomes an instrument of "political protest" in combination with texts by Miguel Barnet and Christopher Caudwell in music by Hans Werner Henze (*El Cimarrón*) and Helmut Lachenmann (*Salut für Caudwell*) respectively; and (d) it generates spectral phenomena specific to the plucked strings of the guitar in works by Tristan Murail (*Tellur*) and Horatio Radulescu (*Subconscious Wave*). The solo guitar in recent years has also become a medium for virtuosic and "polyphonic" works such as Alvaro Company's *Las Seis Cuerdas*, Luciano Berio's *Sequenza XI*, Brian Ferneyhough's *Kurze Schatten II*, Elliott Carter's *Changes*, James Dillon's *Shrouded Mirrors*, Klaus K. Hübler's *Reißwerck* and the many guitar compositions of Maurizio Pisati. Other contemporary composers, among them Rolf Riehm (*Tocatta Orpheus*), Helmut Oehring (*Foxfire Eins*), Josh Levine (*Downstream*), and Richard Barrett (*Colloid*) have used the guitar to create a unique and sometimes rarified sound world through the use of extended techniques or the use of elaborate guitar preparations.

**The Techniques of Guitar Playing** is aimed at musicians, composers, and others involved in creating contemporary art music particularly for the guitar. A thorough, in-depth guide to guitar

techniques is long overdue, given the expanding use of the instrument in contemporary classical music. Several factors have contributed to this trend. Small chamber ensembles have become a predominate force in contemporary music, especially in Europe and America, while a number of guitar virtuosos have dedicated themselves to developing the instrument in this context as well as in solo settings. In addition, guitar studies have emerged increasingly as an academic discipline, which in turn has generated greater interest in current guitar literature.

However, writing for and playing the guitar both present special challenges, especially in the context of contemporary music. Established composers as varied as Luciano Berio, Pierre Boulez, Elliott Carter, and Mauricio Kagel have successfully realized major works for or with the instrument largely because they relied on close, painstaking collaborations with particular guitarists. Moreover, even for composers who themselves play the guitar, writing for it often remains problematic. The composer must contend with how to blend and balance the guitar's unique timbre and dynamic qualities with other instruments. They must be aware of the rich variety of sounds that the guitar itself can produce, even from a single plucked string. No less importantly, they must be able to notate an array of such techniques so that the performer can properly interpret them.

Music students and faculty in both Europe and the America have repeatedly asked for an up-to-date book explaining contemporary guitar performance practice. Similarly, young composers throughout the world have requested more information about writing for the guitar but have no access to the necessary repertoire or expertise. Indeed, only three books on extended performance technique for modern classical guitar have appeared to date: Patrizia Rebizzi and Ruggero Tajè's *La Chitarra nella Musica de '900 (tecniche e semiografia nella musica contemporanea)*, published in 1987, John Schneider's *The Contemporary Guitar*, published in 1985, and Jean-Luc Mas' *Sonorités Nouvelles*, published

in 1984. Even in major metropolitan areas, very few guitarists possess the requisite knowledge and experience to successfully address contemporary guitar literature.

There is thus a pressing need for a solid reference book that will facilitate an understanding not only of more extended guitar techniques but also of orchestrating new sounds with the guitar as well as contemporary guitar notations—that is, how best to integrate the guitar into different musical settings, and how, visually, to convey new musical ideas and techniques to guitarists. Through detailed, comprehensive documentation (both graphic and acoustic), *The Techniques of Guitar Playing* will help aspiring composers to expand the literature and performers to better interpret it. The accompanying CD will hope to sonically illuminate many of the timbres and textures discussed throughout. In each of the examples from the literature cited, if the tempo indication is not in the example itself, then we have provided it for the reader below in order to fully appreciate the musical context in which a given technique is executed.

This book addresses as many paths as possible that have been traversed by the contemporary guitar in order to give the reader a sense of the guitar's rich recent history and unlimited future possibilities. Rather than cataloguing techniques for the guitar, our book presents these techniques

within the stylistic, aesthetic, and historical contexts from which they are inseparable. We give equal importance to guitar acoustics, literature, history, orchestration and playing techniques. Originally, we intended to also include the electric guitar because of its ever-increasing use in contemporary music. However, the vastness of the electric guitar's sound palette in combination with sophisticated analog and digital technologies, requires that this subject be dealt with in a separate volume.

*The Techniques of Guitar Playing* aspires to be user friendly, incorporating clear fingering charts, harmonic charts, bi-tone charts, etc., as well as best defining the musical context for each example from the literature cited. Furthermore, over the years, as performer and composer, we have been in a unique position to practically experience what does and does not work with the guitar in a multitude of contexts. Throughout the book, we occasionally offer suggestions both in terms of practical notation of techniques and their orchestration. These suggestions are not meant to delimit the guitar's potential but rather to serve as a springboard for further imaginative speculation with the instrument by young composers and musicians. Indeed, we hope that this book will motivate, inspire, and provoke composers and performers to further explore, experiment and create new works for the classical guitar.

If a natural harmonic is to be produced by the use of the RH only, then a diamond with “RH” above it is recommended:



Figure 2.7. Notation for a natural harmonic played solely by the RH.

2.6.1 Notation of harmonics on scordatura strings

The scoring of both natural and half harmonics is best transposed to standard tuning. We suggest notating them just as in the scordatura where the sounding pitches are notated on a smaller upper staff, as discussed in Chapter 1.

In the score for Tsao’s *Not Reconciled*, where the guitar is detuned, barred harmonic chords are transposed to standard tuning (Example 2.29, measure 1).

Example 2.29. Ming Tsao, *Not Reconciled*, measures 1–4, Edition Peters

## 2.7 Multiphonics<sup>86</sup>

A multiphonic occurs when at least two pitches are made to sound simultaneously. One of the earliest instances of multiphonics in guitar music is found in Sor's *Fantasia Villageoise* (Example 2.30). Here, the dotted brackets above the staff indicate an unspecified multiphonic chord between the 3<sup>rd</sup>

and 4<sup>th</sup> harmonics (6<sup>th</sup> position) on strings 6 and 5 (the notated *E* and *A*), which is intended to replicate the complex sound of church bells. In order to produce the multiphonics at this juncture, one must coax the LH finger into the just the right position so that several harmonics sound at once.



Example 2.30. Fernando Sor, *Fantasia Villageoise*, op. 52, page 8 (1832), Tecla Facsimile Edition (Tempo: “Andantino”)

Multiphonic technique has been most thoroughly explored and developed by wind and brass players. On the guitar, multiphonic phenomena most closely resemble “split tones” on brass instruments. Split tones result from adjusting the speed of lip vibrations to the vibrating frequency of the pipe length. This adjustment “decenter[s] the note while keeping the pressure in the mouth constant” in such a way that it produces two distinct pitches in the same harmonic series.<sup>87</sup>

Similarly, if one touches a guitar string lightly with the LH, using harmonic pressure between two consecutive nodes on the string, the string vibrates in at least two modes that contain nodes in the same general area. The string vibrates simultaneously in both modes but with conflicting periodicity. For instance, when one plays lightly with harmonic pressure between the third and fourth fret, the string vibrates in modes 5, 6, 11, and 16 (since these modes have nodes in this

area of the fretboard) thus producing a chord that contains the 5<sup>th</sup>, 6<sup>th</sup>, 11<sup>th</sup>, and 16<sup>th</sup> harmonics.<sup>88</sup> The amplitude of the lower harmonics will usually be greater than that of the higher harmonics. As a rule, *every multiphonic will be some combination of natural harmonics on a given string; this combination will be determined by those harmonics that have nodes near where the finger touches the string.*

We recommend that a multiphonic be notated in terms of its fingered position on the guitar, including the string number, and with a separate staff showing the concert pitches above the fingered note. The recommended notation for the fingered notes is a diamond-shaped notehead (to indicate harmonic left-hand pressure) with an “x” through the notehead to distinguish it from a natural harmonic:

<sup>86</sup> Guitar multiphonics were first discussed in Schneider, *The Contemporary Guitar*, 135–38 and have recently been expanded upon in Torres and Ferreira-Lopes “Multiphonics as a Compositional Element,” 61–69.

<sup>87</sup> Sluchin, *Contemporary Trombone Techniques*, 13–16.

<sup>88</sup> Between the third and fourth frets, many other harmonic nodes (higher than the 16<sup>th</sup>) are present but are usually too faint to be discerned.



Figure 2.8. Multiphonic notation

The strongest and most reliable multiphonics are produced on the bass strings, i.e., strings 4–6 on the classical guitar. On the steel-string acoustic guitar, the round-wound G string (string 3), which is commercially available as an option, responds as effectively as strings 4–6. A normal stainless steel G string, like the B and e strings (strings 2 and 1), will tend to respond with less satisfying results.

The charts that appear in the next section (Figure 2.9 A–B) map reliable multiphonics. Each multiphonic appears between two harmonic nodes. When one of the multiphonics is executed, adjacent harmonics, as well as other possible harmonics in the general area, should sound. For example, with *Multiphonic V.5<sup>+</sup>*, which is situated between harmonics 11 and 18 (between the fifth and sixth frets), both the 11<sup>th</sup> and 18<sup>th</sup> harmonics should sound, as well as the 4<sup>th</sup> and 7<sup>th</sup> harmonics, which have a strong presence in that locality. Higher harmonics are rarely audible although they may well lie in the adjacent areas (e.g., the 15<sup>th</sup> and 19<sup>th</sup> harmonics that lie to the left of *Multiphonic V.5<sup>+</sup>*, etc.). Each multiphonic in Figure 2.9 is accompanied by a position number (i.e., *I.5*, *II* –, etc.). Each position number correlates to a chord, which is annotated in Figures 2.10–2.12 as follows:

- (a) The concert pitches of each multiphonic chord (all of which will be harmonics based on the open string)
- (b) Beneath each chord, the numbers of the harmonic series of the pitches involved
- (c) To the right of each chord, the stopped pitch for executing the multiphonic

- (d) The string number at the beginning of each figure
- (e) The relative amplitude of the pitches in the chord

The charts are not exhaustive. Their purpose here is merely to give possible multiphonic chords for a composer or performer to use. Theoretically, multiphonics can be executed between *any* two harmonic nodes on a string. We have indicated only multiphonics that are relatively responsive. The response time and resonance of each multiphonic can vary widely and depends on the type of instrument, the strings, and the method of execution. Precisely locating each multiphonic demands practice. Some of the essential parameters in multiphonic production, at least for the multiphonics represented here, are listed below:

- a) *Position of the LH finger*: finding the exact spot on the fretboard to draw out the desired harmonics requires some searching. Very slight movements of the LH finger in either direction will elicit different harmonics that lie in the vicinity. Angling the finger slightly may help it to isolate the particular harmonic “sweet spot”.<sup>89</sup>
- b) *RH plucking position and manner of plucking*: the RH plucks the string either *apoyando* with the thumb or as a quasi-plectrum stroke with the fingernail of the index finger. Key to the manner of each stroke is a very incisive and forceful attack. The plucking is performed best *sul ponticello* in order to extract the higher harmonics.<sup>90</sup>

89 The very lightest touch possible in the LH is a prerequisite—even more so than when playing a natural harmonic. The little finger has the least amount of flesh at the tip and, when extended, makes a taut skin surface; thus, it

is the finger best suited for accurately locating the mid-way points between the harmonic nodes.

90 On the steel-string guitar, it is advisable to use a plectrum near the bridge.



2.7.1 Positions of selected multiphonics on the fretboard

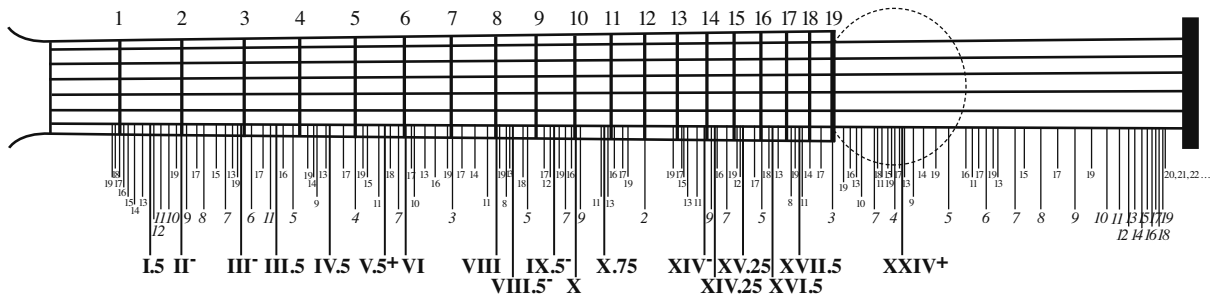
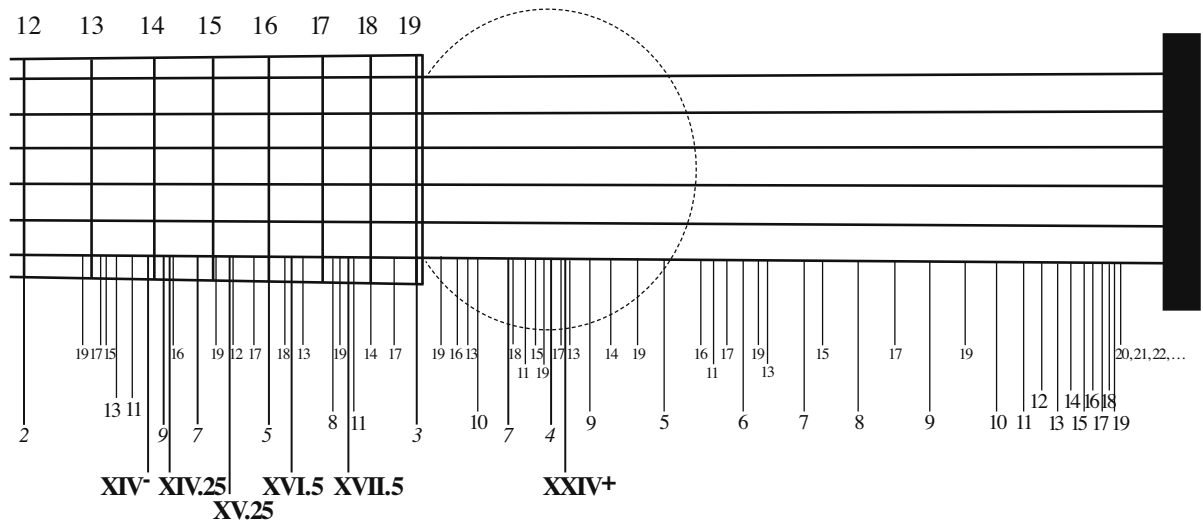


Figure 2.9(A). Location of select multiphonics

Close-up on the Fretboard above the 12<sup>th</sup> Fret



Close-up on the Fretboard below the 12<sup>th</sup> Fret

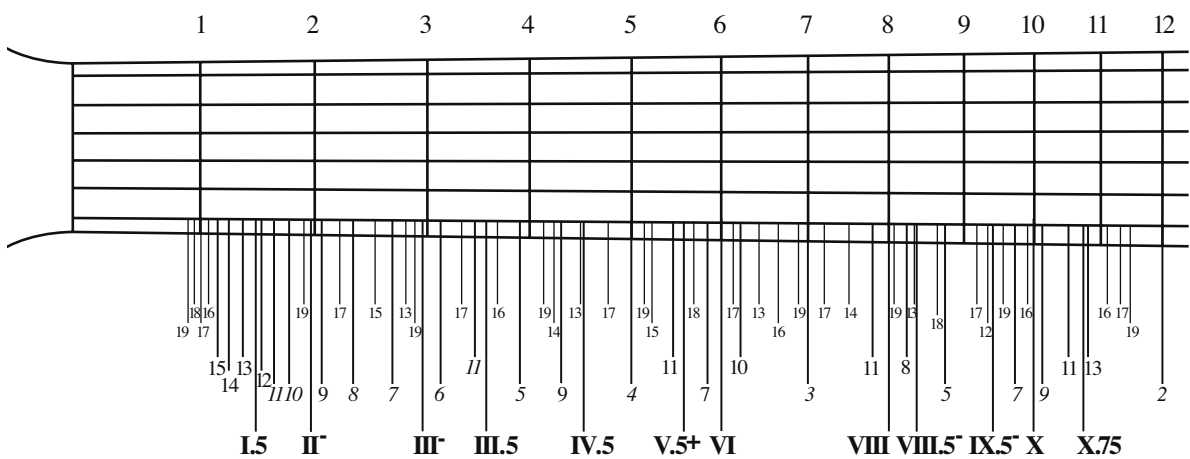


Figure 2.9.(B). Location of select multiphonics in close-up

### 2.7.2 Corresponding multiphonic chords

1. Note on the position number for each multiphonic:

Roman Numeral = Fret Number  
 Arabic Numeral = 1/4, 1/2, 3/4 of the distance up (towards the bridge) between the two neighboring frets  
 -, + = slightly to the left or right respectively of the indicated fret position

2. Note on the accidental for the multiphonic notation:

quarter-tones = placing the LH finger midway between the two neighboring fret positions  
 accidentals with arrows = raising or lowering slightly the placement of the LH finger from the indicated fret position

3. General note on the accidentals for the resultant harmonics:

$\flat$  = natural 7th (or 14th) harmonic (31 cents flat)  
 $\sharp, \flat$  = close to a quarter-tone difference (for the natural 11th and 13th harmonics)

The notation of all other harmonics are approximated to equal tempered tuning.  
 All resultant harmonics are notated as sounding pitch.

The amplitude of the harmonics is differentiated by either strong or weak where:  
 $\bullet < \circ$  in amplitude.



Figure 2.10. Select multiphonics on string 6

String ⑤

A I.5 (11, 12, 13)  
 B II- (9, 10, 11, 19)  
 C III- (6, 7, 13, 19)  
 D III.5 (5, 6, 11, 16)  
 E IV.5 (4, 9, 13, 17)  
 F V.5+ (4, 7, 11, 18)  
 G VI (3, 7, 10, 17)  
 H VIII (3, 8, 11, 19)  
 I VIII.5- (5, 8, 13, 18)  
 J IX.5 (5, 7, 12, 19)  
 K X (7, 9, 16)  
 L X.75 (2, 11, 13, 15, 17)  
 M XIV- (2, 9, 11, 13)  
 N XIV.25 (2, 7, 9, 16)  
 O XV.25 (5, 7, 12, 17)  
 P XVI.5 (5, 8, 13, 18)  
 Q XVII.5 (3, 8, 11, 19)  
 U XXIV+ (4, 9, 13, 17)

Figure 2.10. Select multiphonics on string 5

String ④

A I.5 (11, 12, 13)  
 B II- (9, 10, 11, 19)  
 C III- (6, 7, 13, 19)  
 D III.5 (5, 6, 11, 16)  
 E IV.5 (4, 9, 13, 17)  
 F V.5+ (4, 7, 11, 18)  
 G VI (3, 7, 10, 17)  
 H VIII (3, 8, 11, 19)  
 I VIII.5- (5, 8, 13, 18)  
 J IX.5 (5, 7, 12, 19)  
 K X (7, 9, 16)  
 L X.75 (2, 11, 13, 15, 17)  
 M XIV- (2, 9, 11, 13)  
 N XIV.25 (2, 7, 9, 16)  
 O XV.25 (5, 7, 12, 17)  
 P XVI.5 (5, 8, 13, 18)  
 Q XVII.5 (3, 8, 11, 19)  
 U XXIV+ (4, 9, 13, 17)

Figure 2.10. Select multiphonics on string 4

Factors other than the harmonics proximal to the finger stopping the multiphonic can affect the sounding result:

- (a) The fundamental frequency that varies with each guitar can affect the resonance of the multiphonic and even cause other harmonic nodes to resonate slightly.
- (b) The presence of harmonics that are lower in the harmonic series, not necessarily very close but still near the finger (e.g., the 3<sup>rd</sup> and 2<sup>nd</sup> harmonic nodes) can often accompany the multiphonic sound.

- (c) Octaves of harmonics, particularly lower harmonics, may be audible.
- (d) On occasion, undertones (the inverse of the harmonic series) can be heard.

The morphology of a multiphonic can also change: some harmonics may disappear while others gradually emerge. The harmonic content of a multiphonic chord can thus change subtly with time.<sup>91</sup>

**2.7.3 Examples from the literature**

Few composers until recently have exploited guitar multiphonics in their compositions, with some notable exceptions.<sup>92</sup> Today, however, several composers have begun utilizing this technique, although in very distinctive ways. In *AXE(S)*, Hayden uses guitar multiphonics in an isolated passage that represents a further variation of the

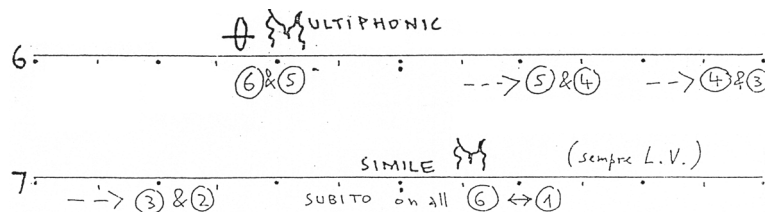
harmonic techniques utilized elsewhere in the composition (Example 2.31). Hayden designates the multiphonics with an uppercase *M*. He indicates the appropriate fingered position with quarter-tones to suggest playing between two frets, and also adds the concert pitches in parentheses above.



Example 2.31. Sam Hayden, *AXE(S)*, measure 269, British Music Information Centre

In *Subconscious Wave*, Radulescu specifies the string number but leaves the choice of the multiphonic up to the performer. At times he asks that the

multiphonic be performed with a violin bow. In the following passage, multiphonics are explored on successive pairs of strings (Example 2.32).



Example 2.32. Horatio Radulescu, *Subconscious Wave*, systems 6–7, Lucero Print (Tempo: dots = ten seconds; dashes = five seconds)

91 See Appendix A, Part 2 for multiphonic analysis, including spectrographs.

92 William Bland was one of the first composers to use guitar multiphonics. In his composition *Untitled Compositions*

in *Three Sections* (1975) the multiphonics, which he calls “complex harmonic partials” are executed in rapid succession. Schneider, *The Contemporary Guitar*, 136.

With the accented  $A^\dagger$  indication above middle C, Pisati proposes another unorthodox means of eliciting a multiphonic: a passage from his *Setti Studi* (Example 2.33) instructs the guitarist to bring the LH thumb around to the fretboard to

stop string 6 between the fifth and sixth frets. As it does this, the width of the thumb in itself guarantees that many harmonics lying in that area of the fretboard will sound.

The image shows a musical score for guitar. It features a single staff with a treble clef. The score includes a half note with an accent and a dagger symbol ( $A^\dagger$ ) above it, with the word "imam" in a box above the note. Below the staff, there are several markings: a circled 4, a circled 4, and a circled 2. There are also some handwritten notes and symbols, including "L.V." and "P". The score is marked "Allargando" and "10". At the end, there is a circled P and the text "(amipimamie)".

Example 2.33. Maurizio Pisati, *Setti Studi*, Studio 4, page 15, system 4, Ricordi (Tempo:  $\text{♩} = 44$ )

Ambrosini signals the use of the multiphonic through what he calls *meta posizione* (meta position)—as opposed to normal position—of the LH finger. The meta position appears above the staff and indicates which two frets to place the finger

between and how far from each fret it should sit. In Figure 2.13, for example, “ $\frac{1}{2}$  III” denotes a position halfway between frets II and III, first on string 4, the lowered  $F$  natural, and then on string 5, the lowered  $C$  natural.

The figure consists of two parts. On the left, there is a musical notation example showing two notes on a staff. The first note is marked with  $\frac{1}{2}$  III and the second with  $\frac{1}{2}$  II. Below the staff, there is a diagram of a guitar fretboard. The fretboard has six frets. The first two frets are labeled "meta pos." and the last two are labeled "NORMALE". Arrows point from the "meta pos." label to the first two frets and from the "NORMALE" label to the last two frets. To the right of the diagram, there is a block of text in Italian: "Metà posizione: con questa scrittura si è indicato l'armonico che si ottiene sfiorando con il dito circa a metà della distanza che separa due tasti."

Figure 2.13. Claudio Ambrosini, *RAP*, legend, manuscript<sup>93</sup>

Clemens Gadenstätter’s *variationen und alte themen* contains a passage scored for trombone, guitar, cello, and contrabass (Example 2.34) in which all three string instruments are to produce multiphonics ( $M$ ). The guitarist (fourth and fifth systems from the bottom) is to play unspecified

multiphonics on string 6 in an area of their choosing, but under the condition that they must find the multiphonics with the richest sound possible.<sup>94</sup> Note that the last multiphonic is performed in a barré manner across strings 6–3, rather than on 6 alone.

93 Legend translates as follows: Meta position: the indicated notation asks for the harmonic that is achieved by placing the finger about half the distance between two frets. Ambrosini, legend for *RAP* (translation Ambrosini/Seth Josel).

94 “Die genauen Berührungsstellen sind frei wählbar, sollten aber immer ein möglichst charakteristisches Klangbild erzeugen.” Gadenstätter, *variationen und alte themen*, legend.

The image shows a musical score for guitar, measures 80-83. The score is in 4/4 time and includes staves for guitar and voice. Annotations include 'Laco', 'Sim.', 'Bogen weg', 'Mozz. sempre', 'Alleg. sempre (rit. assai a un-a)', and 'Bogen weg'. The score shows various techniques such as artificial harmonics, slurs, and dynamic markings like 'fff'.

Example 2.34. Clemens Gadenstätter, *variationen und alte themen*, measures 80–83, Ariadne Verlag (Tempo: ♩ = 76)

## 2.8 Artificial harmonics<sup>95</sup>

Any fretted note creates a new fundamental pitch on the guitar and, by implication, a new harmonic series. *Artificial, false, or prepared* harmonics, three common terms that denote the same phenomenon, are harmonics derived from fretted pitches rather than open strings. Artificial harmonics allow one to produce harmonics using any fretted pitch as a fundamental. They thus considerably expand the harmonic possibilities of the instrument beyond the confines of natural harmonics, which stem exclusively from the fundamental pitches of the open strings.

Artificial harmonics on the guitar are executed in a manner similar to classical string techniques employed on the violin and cello. In general, the LH little finger stretches past the fretted note and *lightly* touches the string at a certain interval or node above it. Some harmonics will emerge at intervals not far above the fretted note and therefore involve less of a stretch: to trigger the 5<sup>th</sup> harmonic requires reaching only a major third, and the 9<sup>th</sup> harmonic only a major second. Touching the string a perfect fourth above the note will produce the 4<sup>th</sup> harmonic. Similarly, touching a perfect fifth above it will elicit the 3<sup>rd</sup> harmonic, but only if the guitarist can extend the little finger that far.

<sup>95</sup> See Mas's section on "prepared harmonics." Mas, *Sonorités Nouvelles Pour Guitares*, 31–32.