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## Thinking through the guitar : the sound-cell-texture chain

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## Chapter 11 Hammered Sounds

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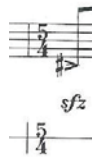
# Chapter 11 Hammered Sounds

Hammered sounds come into existence when a non-ringing string is hammered upon on the fretboard with a finger of the right or left hand. This chapter shows ways in which the composer can handle the characteristics of the hammered sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 11.1 Sound

### 11.1.1 Pitch range

Figure 11.1 Hammered sound notation



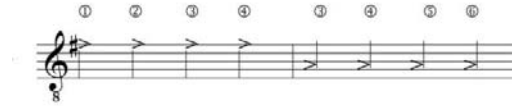
(PERCUSSION STUDY NO. 1, KAMPELA)

The complete guitar range can be used when scoring hammered sounds, except for the open sixth string. In all ranges, the hammered sound is produced by making a hammering movement with one or more fingers onto the fretboard and may involve a movement of the arm in order to make the note louder. This movement is usually performed by the left hand, but may also be performed by the right hand. A significant characteristic of hammered sounds is that each note is performed by one hand alone, leaving the other hand free to produce other sounds, if desired. There is no standard notation for hammered sounds; Kampela uses an accent symbol as a notehead to indicate hammered notes in his score (Figure 11.1). Brouwer uses a regular notehead with a cross on the stem (Figure 11.12), while Berio uses a separate staff for notes that are hammered with the right hand (Figure 11.18). All these types of notation are clear to the performer. The composer can choose whether to use a verbal indication, symbol or a different notehead.

### 11.1.2 Timbre possibilities

## Stopping position

Figure 11.2 Stopping position changes



The timbre of hammered notes can be altered by changing the stopping position (Figure 11.2). The plucking position of hammered sounds cannot be varied, as hammered sounds are produced with a hammering move of one hand.

## Etouffé

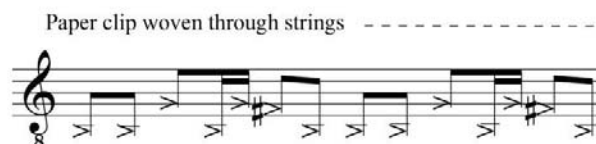
Figure 11.3 Etouffé hammered sounds



Etouffé hammered sounds are performed by hammering a note with the left hand and simultaneously slightly damping it with the side of the right hand (Figure 11.3). Sounds scored etouffé have a reduced resonance and dynamic range.

## Prepared guitar

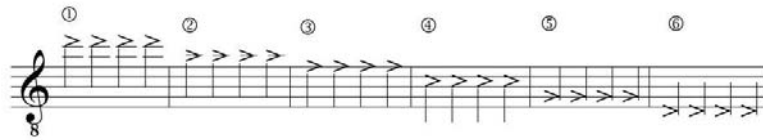
Figure 11.4 Paper clip preparation



The timbre of hammered sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar (Figure 11.4). The initial sound of a hammered note prepared with a paper clip is very similar to that of a non-prepared hammered note. However, during the ensuing resonance of the note, the effect of the paper clip preparation becomes apparent, turning the tone color into a gamelan-like sound. The sound of the paper clip preparation therefore becomes more audible on longer notes than on shorter notes.

## Bi-tones

Figure 11.5 Bi-tones created by hammering on fretboard



The percussiveness of the right hand tapping leads to an additional pitched sound, termed as a *bi-tone* by Schneider (1985, pp. 126-130). Depending on the string and the position in which it is produced, the bi-tone has different dynamic levels and degrees of clarity, but is always at a much lower dynamic level than the hammered tone. The bi-tone is difficult to hear on the high strings, but is more audible on the lower strings.

### 11.1.3 Dynamic range

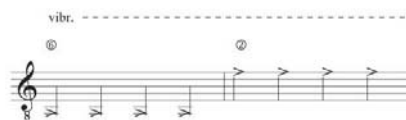
Figure 11.6 Hammered note dynamics



The dynamic range of hammered sounds is relatively wide on the metal-wound strings, but much less so on the nylon strings (Figure 11.6).

### 11.1.4 Vibrato

Figure 11.7 Hammered sound vibrato



All hammered sounds can be scored with lateral or vertical vibrato (Figure 11.7). The performer can initiate the vibrato immediately following the hammering of the note.

### 11.1.5 Pitch bends and microtones

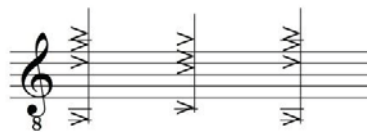
*Figure 11.8 Hammered pitch bending*

Pitch bends for hammered sounds can be prescribed in the same manner as for regular plucked notes. Microtones can also be prescribed in the same manner: they are attained through a microtonal scordatura or through bending the string. Hammered notes can be scored as microtones, but are always preceded by the non-microtonal hammered pitch that sets off the sound (Figure 11.8).

## 11.2 Vertical cells

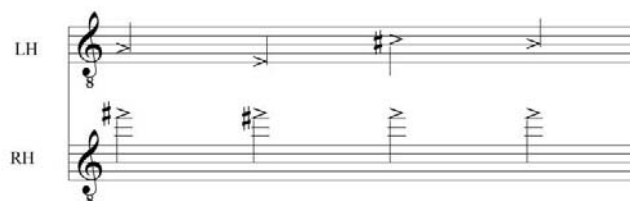
Hammered sounds can be scored as vertical cells, or in combination with other sounds.

### 11.2.1 Combinations of two to six notes

*Figure 11.9 Four-note vertical cells*

When scoring vertical cells of hammered notes, it is possible to combine up to four notes. Various spacings are possible, as long as they fit within the hand span of the position in question. It is not necessary to score these vertical cells on adjacent strings, as each note is produced with a single finger (Figure 11.9). Additionally, it is possible to use hammered bar chords, which makes it possible to create six-note hammered chords.

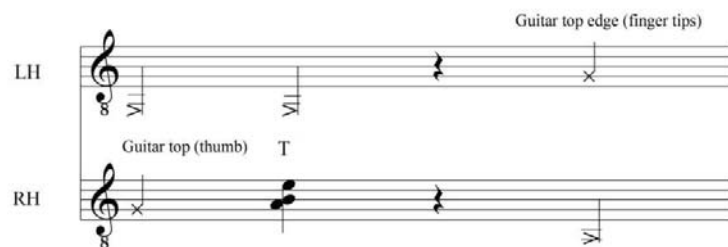
### 11.2.2 Combinations of two notes on distant locations on the fretboard

*Figure 11.10 Hammered note combinations on distant locations*

It is possible to score note combinations that are to be hammered with two hands: in such cases, two-note combinations are most effective as combinations of more notes are less audible. When scoring hammered notes that are to be performed with two hands, note combinations that cannot be covered by the hand span of one hand can now be scored (Figure 11.10).

### 11.2.3 Combinations with other sounds

Figure 11.11 Hammered note combinations with other sounds



When scoring hammered sounds that are performed with the left hand, it is possible to create vertical cells of hammered sounds combined with other sounds performed with the right hand alone. Sounds that can be performed by the right hand alone in such a combination are plucked sounds, natural and artificial harmonics, strummed sounds, rasgueado sounds, right hand percussion, pitched and natural harmonics tambora (Figure 11.11), percussive tambora, Bartok pizzicato sounds, buzzing string sounds, scratching string sounds, and inverted stopping sounds.

When scoring hammered sounds that are performed with the right hand, it is possible to create vertical cells of hammered sounds combined with other sounds performed with the left hand alone. Sounds that can be performed with the left hand alone in such a combination are plucked sounds, open string strumming, left hand percussion (Figure 11.11), percussive tambora, open string Bartok pizzicato sounds, scratching string sounds, and sounds produced by plucking behind the nut.

## 11.3 Horizontal cells

Hammered sounds can be scored into two types of horizontal cells: single line horizontal cells and vertical cell sequences. In this section, both types are discussed.

### 11.3.1 Single lines of hammered sounds

#### Design



Figure 11.12 Two-hand hammering



(PAISAJE CUBANO CON CAMPANAS, BROUWER)

A single line horizontal cell of hammered sounds is a succession of single hammered notes. The horizontal cell can be scored for one hand or for two hands (Figure 11.12).

Figure 11.13 Delayed ascending slur



(PERCUSSION STUDY NO. 2, KAMPELA)

Kampela also uses the notation of hammered notes for delayed ascending slurs to avoid confusion as to the status of the intermediary note(s) that are performed as plucked notes (Figure 11.13). This is a useful and clear notation for such situations, but the notes scored with alternative noteheads are not in fact hammered sounds.

## Resonance

Figure 11.14 Resonance



Horizontal cells of hammered sounds can be scored in such a way that they sound on into the temporal space of subsequent notes; this is possible when they are scored within one left-hand position (Figure 11.14). In order to produce notes that do not ring on, the performer can easily end the resonance by lifting the finger that produced the hammered note in question.

## Harmonic possibilities

As is the case for single lines of plucked sounds, single line horizontal cells of hammered sounds have a very broad range of harmonic possibilities, because the performer only has to be concerned with one

line. Because of the wide range of possibilities to combine pitches, single lines horizontal cells of hammered sounds lend themselves well to writing in keys not directly associated with the pitches of the open strings, as well as for twelve-tone and serial writing. This is particularly the case when the single line horizontal cells of hammered sounds are performed with two hands.

## Speed

*Figure 11.15 Rapid hammered note sequence*



Single line horizontal cells of hammered sounds performed with one hand can be scored at relatively high speeds, especially when they consist of a small number of alternating notes or a row of consecutive notes, and when they are scored with legato articulation. Rapid sequences have a more limited dynamic range, as they give the performer little time to prepare for a powerful hammering action onto the fretboard (Figure 11.15).

*Figure 11.16 Rapid two-hand hammering sequence*



(PAISAJE CUBANO CON CAMPANAS, BROUWER)

When performed with two hands, slightly higher speeds can be scored (Figure 11.16).

## Articulation

Single line horizontal cells of hammered sounds can be scored with a variety of articulations, including slurs, legato, accents, staccato and glissando.

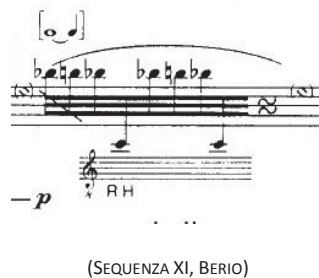
## Slurs

Figure 11.17 Slur in hammered note sequence



One or more notes in a sequence of single line hammered sounds can be connected to a subsequent note by means of a slur (Figure 11.17). It is a prerequisite for the slurred note to be located within the hand span.

Figure 11.18 Right hand hammering and slurs



Berio combines right hand hammering with ascending and descending slurs performed with the right hand and the left hand (Figure 11.18). In order to avoid confusion between slurs and hammered notes, the notation used here by Berio, with the slurred notes on the top staff and the hammered notes on a temporary second staff, is clear and easily decipherable for the performer.

### Legato

Figure 11.19 Hammered note legato



Because of the percussive quality of hammered notes, the performer can create a legato articulation by mixing hammered notes with slurs (Figure 11.19). Notes that are located on the same string as the initial hammered note on the string in question are then performed as slurs, rather than hammered notes.

### Accents

Figure 11.20 Articulation of hammered notes



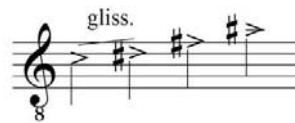
Single line horizontal cells of hammered sounds can be scored with accents (Figure 11.20). The accent is performed by hammering on the fret in question with more force than surrounding notes. Hammered notes have a sufficient dynamic range for these accents to stand out dynamically, particularly on the metal-wound strings.

### Staccato

Single line horizontal cells of hammered sounds can be scored with staccato articulation. The guitarist performs the staccato either by lifting the finger off the fretboard after attack (Figure 11.20), or damping the string with the left hand or right hand.

### Glissando

Figure 11.21 Hammered note glissando



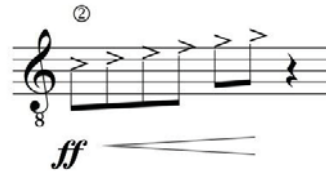
Glissando can be used to connect notes in a single line. The glissando can be performed literally, when the composer prescribes a literal glissando between two notes (Figure 11.21), or as a partial glissando. Additionally, single lines of hammered sounds can be scored with a tuning key glissando.

### Embellishment

Embellishments can be employed in single line horizontal cells of hammered notes by attaching a left hand trill to a note in the sequence. When the left hand is performing the embellishment, the right hand can perform hammered notes or other sounds.

## Non-functional writing

Figure 11.22 Non-functional writing



An example of non-functional writing for single line horizontal cells of hammered notes:

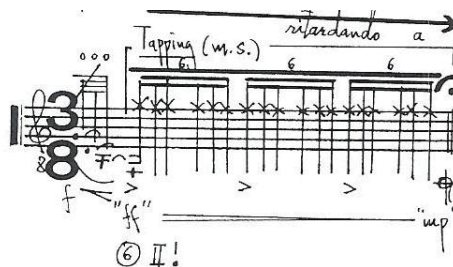
- *Fortissimo* scoring for hammered notes on nylon strings (Figure 11.22)

## Combinations with other sounds

Single line horizontal cells of hammered notes are sometimes scored in close conjunction with other sounds. In this section, combinations from the repertoire are discussed.

### *Hammered sounds combined with plucked sounds*

Figure 11.23 Hammered sounds combined with plucked sounds



(CUADERNO DE FRIEDENAU, SÁNCHEZ-VERDÚ)

Sánchez-Verdú combines hammered sounds with plucked sounds: a plucked arpeggio of open strings is used to create the resonance in which the hammered sounds are performed (Figure 11.23). These two sounds can be connected at high speeds, as the plucking is performed with the right hand, while the hammering is performed with the left hand.

Figure 11.24 Hammered sounds combined with plucked sounds

mp

p h m̄ m̄ i

4 3 3 3 3 3

⑥ ① ②

(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela creates rapid sequences of hammered sounds and plucked sounds by having them performed at the same pitch (Figure 11.24).

#### Hammered sounds alternated with strummed sounds

Figure 11.25 Hammered sounds alternated with strummed sounds

f

secco

h s h s h s h s h s h s h s

7 7 7 7 7 7 7 7

⑥

(PAISAJE CUBANO CON CAMPANAS, BROUWER)

Brouwer alternates single hammered sounds with chords that are strummed downward (Figure 11.25). These two sounds can be connected at high speeds, as the hammering is performed with the left hand, while the strumming is performed with the right hand.

#### Hammered sounds alternated with percussion sounds

Figure 11.26 Hammered sounds alternated with percussion sounds

Repeat 3 to 4 times

mf

f

p h m̄ pami p p

2 2 ① 2

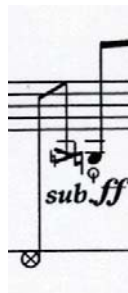
⑥ ② ① ②

(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela alternates hammered sounds with nail percussion and left hand plucking (Figure 11.26). These two sounds can be connected at high speeds, as the hammering is performed with the left hand, while the percussive sounds are performed with the right hand.

*Hammered sound sequenced with Bartok pizzicato and a percussion sound*

Figure 11.27 Rapid sequence including hammered sound

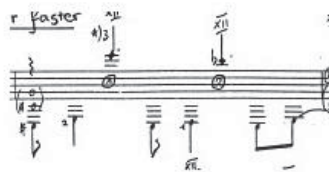


(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela frequently uses a sequence of a right-hand guitar top percussion sound and a left-hand hammered sound followed by a Bartok pizzicato on the same pitch (Figure 11.27). This sequence can be scored at very high speeds, as this horizontal cell is performed with a right-hand move, followed by a left-hand move and finished with another right hand move, while the left finger stays in the same position.

*Hammered sounds alternated with harmonics*

Figure 11.28 Hammered sounds alternated with natural harmonics



- \*1: The left hand plays alone (by hammer-ons and pull-offs only) until the first double bar (page 2, end of first line). All notes should be clearly audible.  
 \*2: The notes in brackets are not played, just put down by the left hand for some artificial harmonics and to prevent certain strings from sounding.

(CRYSTAL VERMIN, MAIER)

Maier creates two-part cells in which the bass line is performed with the left hand alone and consists of hammered notes and pull-offs, while the right hand performs natural harmonics. The connection speed between these sounds is very high, as the bass line is performed with the left hand alone, while the natural harmonics are performed with the right hand alone (Figure 11.28).

### 11.3.2 Vertical cell sequences of hammered sounds

#### Design

A vertical cell sequence of hammered sounds is a succession of vertical cells of hammered sounds. The horizontal cell can be scored for one hand or for two hands. Vertical cell sequences scored for two hands are quite unusual in the guitar repertoire.

#### Resonance

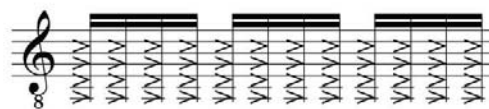
Vertical cell sequences of hammered sounds usually do not ring on into the temporal space of subsequent notes, as the left hand fingers are lifted when moving from one fingering to the next, thus ending the resonance.

#### Harmonic possibilities

The harmonic possibilities of vertical cell sequences of hammered sounds are more limited than those of single line horizontal cells: the options depend on the left-hand span of a given position. When a succession of vertical cells is scored with fewer notes, there are more possibilities for choosing pitches and keys than is the case with vertical cells containing many notes.

#### Speed

*Figure 11.29 Rapid hammered vertical cell sequence*



Sequences of hammered vertical cells can be scored at moderate speeds. When such sequences contain repetitions of a vertical cell (Figure 11.29) they can be scored at higher speeds than when the structure or the playing position of the vertical cell changes frequently.

#### Articulation

Vertical cell sequences of hammered sounds can be scored with a variety of articulations, including slurs, legato, accents, staccato and glissando.

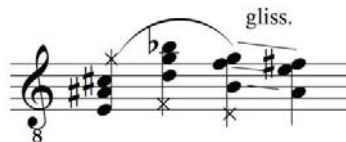


### Slurs

One or more notes in a vertical cell sequence of hammered sounds can be connected to a subsequent note or vertical cell by means of a slur. The slurred notes, as a rule, should fit within the left-hand span of the position in question.

### Legato

Figure 11.30 Legato and glissando in hammered vertical cell sequence



Sequences of different vertical cells that are located close by on the fretboard are easier to perform legato than vertical cells that are further apart. Because of the percussive quality of hammered sounds, the performer creates a legato articulation by performing the vertical cell sequence in such a way that the hammered notes do not sound overly percussive, and by striving to avoid interruptions of sound in the transition between the vertical cells (Figure 11.30).

### Accents

The composer can make one or more vertical cells in a sequence stand out by using an accent. Such accents work particularly well if the vertical cell is scored over metal-wound strings, due to their broader dynamic range when compared to hammered notes on nylon strings.

### Staccato

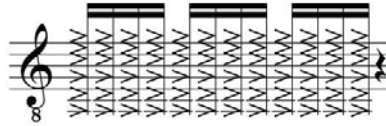
Vertical cell sequences of hammered sounds can be scored using a staccato articulation. The guitarist performs the staccato by either lifting the finger off the fretboard after attack or damping the string with the left or right hand.

### Glissando

Vertical cells sequences of hammered sounds can be scored with literal glissando, partial glissando or tuning key glissando. Literal glissandos of vertical cells of hammered sounds are most effective when they are scored with the same left hand fingering (Figure 11.30); changing fingerings during the course of such glissandos reduces the clarity of the glissando. When scoring vertical cells with tuning key glissandos, only one string can be detuned at a time.

## Non-functional writing

Figure 11.31 Non-functional writing



Examples of non-functional writing for vertical cell sequences of hammered sounds:

- Six note vertical cell sequences that cannot be hammered with a bar (Figure 11.31)
- *Fortissimo* scoring on the nylon strings

## Combinations with other sounds

When scoring vertical cell sequences of hammered sounds, the same sound combinations are possible as in the case of single lines of hammered sounds. This is because in both cases only one hand is involved in creating the hammered sounds, while the other hand is free to perform other types of sounds.

## 11.4 Textures

In the guitar repertoire, both continuations and combinations of horizontal cells containing hammered sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

### 11.4.1 Textures as continuations of horizontal cells

#### Left hand alone texture

Figure 11.32 Left hand alone texture

Var. 14  
mano izquierda sola  
左手だけでひく

(GRAN JOTA DE CONCIERTO, TÁRREGA)

Tárrega scores a single line of sounds that are hammered and slurred, creating a left-hand alone texture (Figure 11.32). In the *Gran Jota*, the left-hand alone texture is used to score a variation on the main theme with an altered sound. Due to the relatively low dynamic level of the hammers and slurs, as well as the various position changes, the scratching noises on the metal-wound strings caused by these position changes is an audible component of this passage.

### Two-part texture of hammered notes and harmonics

Figure 11.33 Two-part texture of hammered notes and harmonics

The image shows a musical score for an amplified classical guitar. The title is 'CRYSTAL VERMIN' and it is for 'amplified classical guitar'. The score is written for two staves. The first staff has a tempo marking of 'sharp & powerful, with extreme precision' and a metronome marking of '♩ = 168 or faster'. The second staff has a tempo marking of 'FLORIAN MANNING MUSIC'. The score features a complex two-part texture with hammered notes and natural harmonics. The notation includes many slurs, hammer-ons, and natural harmonic symbols. The piece is in 3/4 time and the key signature has one sharp (F#).

(CRYSTAL VERMIN, MAIER)

Maier continues a sequence of two-part scoring in which the bass line is performed with the left hand alone and the top notes are natural harmonics, while the right hand performs natural harmonics for many measures, creating a texture that consists of the combination of these sounds (Figure 11.33). The hammered notes are appropriately scored on the lower strings, in order for them to be as audible as possible. A scordatura is used: the third string is tuned a semitone down to f sharp, while the sixth string is tuned down a minor third to c sharp. This allows Maier to score the unusually low bass line, as well as pitch combinations of natural harmonics other than those used in regular tuning.

## Two-hand hammering texture

Figure 11.34 Two-hand hammering texture

(PAISAJE CUBANO CON CAMPANAS, BROUWER)

Brouwer creates a texture of notes hammered by the left and right hands (Figure 11.34). The use of two hands for hammering makes it possible to use large intervals, as well as large and rapid interval jumps, which are not possible with one hand or with regular plucking, as the intervals do not fit within the hand span. This passage requires a type of finger coordination on the part of the guitarist that is not often trained, as it does not commonly appear in compositions. In order to ensure playability, Brouwer appropriately uses a limited set of hammering positions.

### 11.4.2 Textures as combinations of horizontal cells

#### Texture of plucked sounds, hammered sounds, percussion sounds and Bartok pizzicato sounds

Kampela creates textures that braid plucked notes, hammered notes, left- and right hand percussion, Bartok pizzicato together at high speeds (See Chapter 9 and 10).

#### Texture of hammered sounds, plucked sounds and etouffé plucked sounds

Figure 11.35 Mixed texture

“Tapping” (percusión con el dedo -m.d. o m.s.- sobre la cuerda y traste señalados)

armónicos naturales: se indica dónde se debe tocar y sobre ello, en otro pentagrama, el resultado sonoro

disminuir la presión del dedo sobre la cuerda hasta llegar a la posición de armónico natural

(CUADERNO DE FRIEDENAU, SÁNCHEZ-VERDÚ)

Sánchez-Verdú creates a texture that alternates hammered sounds, plucked sounds and etouffé plucked sounds (Figure 11.35). Hammering is used here in an inventive manner; the hammered notes accompany the natural decay of the arpeggiated chord resonance. The use of open strings in this chord enhances the resonance, while the scordatura creates an open string resonance that differs from open string resonance in standard tuning. Another example of creative scoring appears in the second measure of the first line and the second measure of the third line, where a fingered note is slowly released to transform the regular plucked sound into a muffled sound, and finally into a natural harmonic. In order to score such a transformation, the composer should look for a fret that has an audible nodal point in the corresponding position.