

# **PAGANINI'S *24 CAPRICES* OPUS 1: A TRANSCRIPTION FOR ELECTRIC GUITAR, AND ANALYSIS AND DEVELOPMENT OF THE TECHNIQUES REQUIRED TO PERFORM THEM**



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A thesis submitted in fulfillment of the requirements for the degree of PhD,  
Massey University, New Zealand  
March 2008

## **Acknowledgements**

I thank my supervisors Donald Maurice, Alan Badley and Matthew Marshall for their help, encouragement and enthusiasm through the years.

I would also like to thank Libby and Danny for their support and tolerance for all the music and endless hours of practicing. My thanks also go to my parents for their love and support, especially my mother Elizabeth Davenport who passed on before the degree was completed.

## Abstract

Since the late 1970s much interest has been shown in the development of electric guitar technique. Advances have been considerable, enabling players to explore new genres and repertoires but development methodologies have remained woefully fragmented. A new approach that sets out to promote electric guitar technique with development methodology is the purpose of this study. To this end, a process of transcription combined with an advanced technical analysis has been undertaken including a full categorization of the technical subgroups extant within each Caprice. The hypothesis behind this task has been to ascertain whether a ‘technical essence’ could be discovered in the Caprices and how that could be imparted in the process of transcription.

Transcribing the *24 Caprices* for the electric guitar disclosed the technical components required for development which were then reduced to their constitute elements. The virtuosity and variation within the Caprices ensured that the each identified technique was developed to a high degree. The subjective nature of transcription ensured that multiple solutions were explored when a single solution to a technical problem was not obvious.

The analysis section of the study demonstrated that three fundamental techniques were required to play all *24 Caprices*: alternate-picking, sweep-picking, and hammer-ons and pull-offs. The analyses also provided trends showing how each technique needed to be developed to comprehensively cover all twenty-four pieces.

In conclusion, the hypothesis was found to be correct.

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## **Hypothesis**

Through transcription, and analysis of the resulting guitar techniques, it is possible to identify, extract and develop the technical elements required to play Paganini's *24 Caprices* on the electric guitar

## **Introduction**

Since the late 1970s, electric guitar technique has undergone a technical revolution. Arguably, this can be viewed as a natural progression precipitated by artists from the mid-1960s and early 1970s such as Jimi Hendrix, Jimmy Page and Jeff Beck.

As popular instructional mediums such as periodicals and videos/DVDs became more widespread, electric guitar technique and its development thrived. Access to these types of media led many electric guitar players into musical genres otherwise unexplored.

One such genre was extremely prevalent in the 1980s, popularly labelled “neoclassical”. Spearheaded by electric guitar players such as Yngwie Malmsteen and Tony MacAlpine, this genre borrowed heavily from baroque, classical, romantic and 20<sup>th</sup> century music. Popularized by such players, many electric guitarists took an interest in traditional instruments, learning methodologies for developing technique, disciplined practice routines and performance practices.

With this renewed interest, many electric guitar players became obsessed with technical expertise and its development. This pushed guitarists to find progressively more difficult pieces of music to dissect and perform, and to compose new music.



## **Thesis objectives and by-products**

The technical extrapolations and transcriptions utilized in this study are extensive. Such an in-depth investigation will help extend the application of electric guitar technique.

Although, arguably described as a derivative of acoustic nylon string technique, this study clearly defines the electric guitar as a technically evolving instrument with unique demands. As such, it is capable of virtuosity equal to any solo orchestral instrument. This investigation reveals an expanded range of technical possibilities for composers and performers, the practical applications of which stretch far beyond the neoclassical musical genre.

More specifically, many of the technical derivatives presented in this study serve to aid composers of orchestral music. With a greater understanding of the technical possibilities, a virtuosic compositional approach can then be further developed in established forms such as the concerto. This form is just one of the fields that have remained for the most part untapped by composers of western art music, partially due to the lack of knowledge of electric guitar technique that this paper aims to rectify. Existing compositions do not adequately exploit the electric guitar's strengths, expressive nature and subtleties.

Due to the advanced state of development required for performing the *Caprices*, most aspects of established electric guitar technique are addressed. By filling in the technical gaps created when solely focusing on a specific compositional style, a systematic learning methodology for guitar technique in general can be created. This is a valuable by-product of such a study.

## **Approach**

Widely renowned as the pinnacle of advanced violin technique, the *Caprices* by Niccolò Paganini provide an excellent vehicle from which development of advanced electric guitar technique can occur. The diversity of violin techniques is mirrored in the technical solutions required for performance on the electric guitar. In order to build on the technical renaissance of the 1980s an in-depth knowledge of influential performers and their technical contributions is necessary.

Performing the *Caprices* on the electric guitar requires a combination of both physical and musical attributes.<sup>1</sup> In all performance, a high degree of musicality is essential. However, musicality cannot be achieved in this case without attaining an advanced state of physical dexterity, making it for the purposes of this study the primary concern. This basic distinction applies throughout the investigation.

The interdependent nature of physical technique and musicality, dictate to a certain degree the technical solutions presented. Appropriate technique assignment is highly subjective, as it is on the violin,<sup>2</sup> allowing exploration of many different solutions and their consequent development. It is the advanced evolution of these techniques and their interactions that provides the core focus of this study.

## **Methodology**

The methodology is divided into a number of related areas, of which transcription is the initial step. This process helps identify the efficient technical solution/s for each musical

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<sup>1</sup> Jas Obrecht, 'Rising Force'. *Guitar Player*, Vol. 19, No. 5, May 1985, pp. 58-74.

<sup>2</sup> Donald Maurice, 'The Art of Vocal Fingering in String Playing'. *American String Teacher*, Vol. 56, No. 3, August 2006, pp. 27-31.

scenario. Moreover, it allows identification and correlation of the individual elements fundamental to each caprice.

From a technical perspective, each caprice is comprised of multiple micro-techniques that combine when performing a musical passage. To grasp these techniques which must be developed, it is necessary to classify them in a technical overview. This information can then be used for analysis and categorization of micro and macro-techniques specific to each caprice. The technical overview is also used to instantly ascertain the predominant technique/s.

Technical preparation often precedes an event by several bars. However, such an event when viewed in isolation can appear nonsensical, requiring an explanation behind the rationale of such technical decisions. Within this type of investigation, decisions on why technical solutions have been implemented are as important as the solutions themselves. Therefore, each caprice is prefaced by relevant technical commentary.

By using the overviews it is possible to place the *Caprices* into general categories. However, in many of the *Caprices* multiple technical elements are combined to achieve a successful musical result. Nevertheless, there are a small number that rely heavily on one specific technique, making them relatively easy to categorize.

By isolating and identifying the micro-elements, the technical breakdown table helps group the musical and physical aspects into categories. This form of categorization is used to identify the main physical techniques. From here it is possible to identify individual elements (the technical essence) that can be targeted for development.

Once achieved, it is possible to design musical exercises that specifically target and outline the required learning framework, the sole focus of which is the development required to perform the *Caprices* and eventually transcend their imposed technical boundaries.

## **Chapter Précis**

**Chapter 1** elucidates issues in ascertaining technical insight and development from different types of media. It also reviews recordings, discussing strengths and weaknesses of versions of the Paganini works already available. Additionally, it places the electric guitar in its modern context whilst discussing issues of legitimacy in relation to the pursuit of virtuosity. The importance of understanding the electric guitar's place in popular culture and how that has influenced its technical evolution is also addressed. Related to this issue is an understanding of certain historical aspects, including technically influential guitarists and their contributions.

**Chapter 2** investigates the commonality that exists in electric guitar playing irrespective of musical genre and its importance, such as aspects of vibrato and note colouring that provide a distinct personality to musical performance.

**Chapter 3** discusses the unique technical demands of the *Caprices* which require an understanding of the electric guitar's hardware and its function. Closely related to this is the set-up of electric guitar hardware for optimum efficiency.

**Chapter 4** identifies and analyzes the general technical trends found within the *Caprices*.

This provides much of the raw data and weighting needed to determine the necessary analytical depth in the chapters discussing technical development. In order to efficiently achieve this, both a notation summary and full breakdown table are used.

**Chapter 5** includes aspects of sweep-picking present in the *Caprices*, in addition to their combinations with alternate-picking. This begins with the fundamentals at the micro-level expanding contextually into the more complex requirements of the *Caprices*.

**Chapter 6** provides an investigation into alternate-picking as required to execute the *Caprices*. It includes aspects of single-string, adjacent-string and string-skipping motion contextually relevant to the *Caprices*.

**Chapter 7** addresses hammer-ons and pull-offs. These techniques are divided into three distinct sections; left-hand hammer-ons and pull-offs, single-finger finger-tapping and double-handed finger-tapping. The left-hand hammer-on and pull-off portion includes the creation of initial string vibrations, left-hand fingerings, dampening and plectrum usage. The single-finger finger-tapping section is solely focused on the development of the techniques utilized in ‘Caprice No. 6’. This includes a combination of left-hand hammer-ons and pull-offs and single-finger finger-tapping. The final section in this chapter is dedicated to double-handed finger-tapping, arguably the most difficult of all electric guitar techniques. This is largely due to its pianistic approach with each hand autonomously generating string vibrations. Although this technique vastly expands the electric guitar’s repertoire, development revolves around its application to the *Caprices*.

**Chapter 8** investigates the compositional style of the *Caprices* and their utilization of chord shapes and deals with techniques used to best facilitate chord execution. The three main technical categories addressed are finger technique, chicken-picking and chordal strumming.

**Section Two** of the thesis is comprised of the transcriptions and begins by reviewing a range of editions that have been released in both e-book and hard copy. Also covered is the degree to which the Peters Edition of the original violin version has been adhered to in the transcriptions, along with digressions, presentation and guitar issues.

The transcriptions of the *Caprices* are each prefaced by a technical overview and notes. The notes cover a variety of points of interest pertaining to technique and the rationale on why certain solutions were utilized.

### **Acknowledged omissions**

This study acknowledges that there are a number of associated areas that are fields of study in their own right, such as contextual concerns related to Paganini's guitar works and the history of the *Caprices*. However, in order to maximize the focus of this thesis they were outside the designated parameters of this study. A cursory understanding of violin technique, musical history of electric guitar and recorded interpretations of the works are included (along with a music source-list) in order to support the central focus of the study.

## Editorial note

### Fingerings

A fundamental convention is that of fingering notation. This study utilizes a simple system that avoids any confusion that might arise with nylon string fingerings. When placing the hands flat on the surface finger labelling is as follows.

#### Finger labelling

4 3 2 1      1 2 3 4



### Hand identification and perspective

Just as finger labelling needs to be defined to avoid confusion, so too do the hands.

Although it can be argued that the right and left hand should be labelled according to function, for ease of understanding they will be referred to as right-hand (plectrum hand) and left-hand (finger-board hand). Moreover, all examples are from the perspective of the right-hand guitarist, using the convention of left-hand on the finger-board and right-hand holding the plectrum.

### Notation

In English two main notational systems for labelling note values are employed, the British system employing semibreve, minim, crotchet, quaver and semi-quaver, and the

American system employing whole note, half note, quarter note, eighth note and sixteenth note. While both have equal merit, the technical nature of this paper, the extensive use of small note values in the *Caprices*, the American predominance in the development of electric guitar technique and the American source of the majority of the references, made the universally understood numerical terminology the system of choice for this study.

### **Accompanying compact disc**

The *Caprices* presented on the compact disc format have been selected as they cover most of technical elements discussed in the study. ‘Caprice No. 1, 5 and 16’ were recorded using an 8 string guitar with 29 frets, whilst ‘Caprice No. 13 and 20’ were recorded using an 8 string guitar with 24 frets.

### **Referencing**

While following New Zealand School of Music style guidelines with regard to format, the author/editor agreed with supervisors to adopt the American terminology for note values and general spelling. This is due to the environment in which most previous research exists and is the most likely environment in which extracts may be published.

### **Summary**

In focusing on identifying, extrapolating and developing the technical elements required to address the thesis topic, this study reveals benefits to both performers and composers. Additionally, the transcription methodology aids in a more systematic approach to the development of electric guitar technique.



Extensive use of reference material is required in conjunction with a historical context, in order for correct transcription choices to be made. The subjective nature of transcription requires a broad knowledge base of historical aspects, technically influential guitarists and their contributions and a practical application of the techniques in recordings.

# **Section One**

## **Chapter One: Literature, historical, technical and recording review**

### **1.1 Literature Review**

#### **1.1.1 Introduction**

By utilizing a diverse and broad pool of information it is possible to systematically identify and avoid inherent dangers that may be associated with use of literature and media to ascertain insight into electric guitar technique. To gain an insight into “correct” technique, one form of literature often functions as a natural check on another and when used in conjunction with one another a more insightful perspective on technical solutions can be ascertained.

The electric guitar's popularity is to some degree proportional to the status of the music genres in which it is employed. Consequently, literature publications and their content follow similar trends to popular music. This can be seen in main-stream guitar periodicals, the content of which rely heavily on musical transcriptions and lessons to help maximize their distribution. Therefore, the musical and technical information disseminated by these publications is of limited use when examining advanced electric guitar technique. However, when popular musical trends utilize a more advanced style of playing, as they did in the 1980s, examination of periodicals from that time frame can reveal useful technical insight and information.

Much of the technical insight within this kind of literature is gained through examining transcriptions of more advanced music, or alternatively, columns, lessons and articles written or recorded by the players themselves.<sup>3</sup> This can reveal technical stylistic signatures of individual players as well as certain trends in equipment, plectrum usage and learning methodologies.

### **1.1.2 Guitar periodicals**

There are a number of guitar periodicals which provide scholarly dissemination of technical information about the electric guitar and its associated fields of interest. Guitar periodicals such as *Guitar World*, *Guitar*, *Guitar Techniques*, *Guitarist* and *Total Guitar* fall into this category. However, *Guitar Player* is arguably considered the most mainstream. Catering for both amateur and professionals,<sup>4</sup> it features guitar lessons, columns, technical insight on theory, and peripheral aspects such as amplification and pickups. However, as trends changed in the mid 1990s, so too did *Guitar Player's* interest in the more technical aspects of electric guitar technique, opting to feature players from more popular music genres.

### **1.1.3 Contextual technical development**

The problematic nature of allowing musical trends to influence one's technical development can create a fragmented learning methodology. This can create a situation whereby aspects of essential development are ignored, due to the fact that they are “out of style” with contemporary popular music. A good example is the guitarist Joe Satriani. His technical skills arose from listening to Jimi Hendrix, The Rolling Stones, Blues and

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<sup>3</sup> Paul Gilbert started writing a column called “Terrifying Guitar 101” for *Guitar Player* in 1989.

<sup>4</sup> Malmsteen habitually reads *Guitar Player*. Obrecht, *Rising Force*, pp. 58-74.

other related musical genres.<sup>5</sup> Consequently, his technique relies heavily on hammer-ons and pull-offs, as do many blues players, which largely ignores areas of development such as alternate-picking.

It can be argued that this conundrum is exacerbated by the periodicals, thus illustrating one inherent danger of relying on literature alone for the dissemination of information about pure technique. However, periodical literature can be utilized with a certain degree of caution, when moderated by other forms of media such as video/DVD footage. This theme is present in many guitar playing periodicals such as *Total Guitar* and *Young Guitar*, the publishers of which regularly release accompanying instructional DVDs.

#### **1.1.4 Guitar playing and visual media**

While visual media<sup>6</sup> also has its inherent dangers when learning electric guitar technique, since the 1980s it has been the preferred medium by many guitarists. Moreover, this form of media can arguably be described as catalytic in nature, in terms of further conveying aspects of technique. This occurs through video lessons and master classes by renowned technical virtuosos.

With the mass production and distribution provided by videotapes, a much wider audience of electric guitarists has easily gained access to technical insights, previously only attained through individual tuition. However, although guitarists worldwide gained access to a plethora of technical information, learned through observation, the limitations of the media became apparent. Many technical and musical aspects of an individual's

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<sup>5</sup> Joe Satriani, *The Satch Tapes*, USA, Sony Music Distribution, 1992.

<sup>6</sup> This includes DVDs, video discs, video tapes and any other visual method of conveying technical lessons to a vast audience.

guitar style are built up over many years, making it impossible to convey during a one-hour visual lesson. Due to this fact, the majority of lessons were focused on technical issues such as left-hand fingering and plectrum technique. Many of the equally important issues such as string tone, accents and plectrum pressure, were all but completely ignored. This is best illustrated at the beginning of Paul Gilbert's second instructional video<sup>7</sup> where he mentions the need to correct a number of "mistakes" that he had made on his previous video. Rather than being mistakes they were actually omissions which consisted of note colourings, vibrato and accents. These aspects are second nature to guitarists with advanced technique, however, without them being specifically mentioned they can be easily overlooked. This illustrates one of the main concerns that can occur when relying solely on video instruction for insight into technical development.

### **1.1.5 Discography issues**

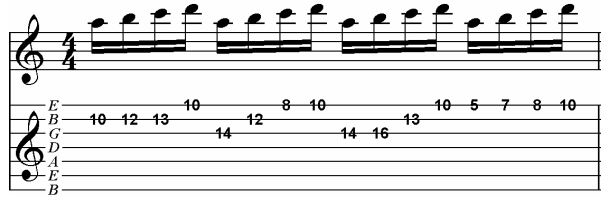
Utilization of a discography is reliant on one's ability to hear everything as it occurs in real time (speed reduction technology notwithstanding). Therefore, accuracy in discerning technical elements is best achieved when used with visual media and transcriptions. The need for transcriptions arises because the same melodic phrase can be expressed in many different positions on the electric guitar, with different groupings of strings and different gauges. Unless the individual using the discography is extremely accurate in terms of discerning the subtle string gauge differences, incorrect, ineffective or inefficient technique can result.

The musical example below illustrates this, utilizing a simple four-note pattern, all examples of which are valid with the first being the most efficient. In this case, all notes

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<sup>7</sup> Paul Gilbert, *Intense Rock 2*, Seattle: R.E.H. Publications Inc., 1991.

are played on the flat wound strings. This makes the subtleties even more difficult to distinguish, without an understanding of the guitarist's idiosyncratic technical methodologies.



Even with the transcriptions from a reputable source there are no guarantees that the note choice is 100% accurate, with inconsistencies being more apparent at fast tempi. A good example of this are the numerous transcriptions of Paul Gilbert's 'Scarified',<sup>8</sup> of which the final section contains adjacent string sweep-picking arpeggios.<sup>9</sup> However, on examination of DVD material in which Gilbert physically demonstrates the final section, it becomes apparent from the outset that this section is executed using string-skipping, in conjunction with hammer-ons and pull-offs.<sup>10</sup> Gilbert's preference for string-skipping arpeggios<sup>11</sup> as opposed to sweep-picking has become one of his cornerstone techniques.<sup>12</sup> This is inconsistent with the transcriber's choice of sweep-picked adjacent string motion and intervallic dispersal of the notes. This illustrates one of the main dangers of being solely reliant on a discography without visual media to aid in the transcription and ultimately the technical development process.

<sup>8</sup> Racer X, *Second Heat*, Shrapnel Records, Inc., SH-1032, 1986.

<sup>9</sup> Dave Whitehill, 'Trading Licks, Scarified'. *Guitar World*, Vol. 9, No. 4, May 1988, pp. 103-10.

<sup>10</sup> Paul Gilbert, *100% Racer X*, Japan: YG Factory Inc., 2001.

<sup>11</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>12</sup> Paul Gilbert, *Guitar Techniques*, England: Future Publishing, 2006.

### 1.1.6 Technical trends and literature

Many “cutting edge” electric guitar players specialize in one or two genres of music with their technical focus reflected in the literature and videos that they produce. For example, the jazz fusion guitarist Brett Garsed is heavily influenced by Alan Holdsworth.<sup>13</sup>

Consequently a comparison of their guitar styles reveals a great many similarities, especially in the overall *legato* touch of both players.<sup>14</sup> Therefore, material produced within Garsed’s instructional video and compositions reflects this influence, irrespective of whether it is technically correct. At the other end of the spectrum Michael Romeo and Joe Stump are both heavily influenced by Yngwie Malmsteen, as can be seen in their aggressive alternate-picking styles and neo-classical vocabulary.<sup>15</sup> Herein lays the problem of using material from one or two individual electric guitarists or genres of music to gain a balanced technical overview, with some genres favoring different techniques.

### 1.1.7 Literature summary

Through in-depth analysis of an individual’s guitar style it is possible to provide a clear picture of the guitarist’s technical strengths and weaknesses. However, if a broad pool of guitarists is examined through observation of visual media and supported by literature, transcription and discography, a more balanced technical viewpoint can be gained. Moreover, this makes it possible to identify and avoid any technical shortcomings that may adversely affect development required for the *Caprices* and beyond.

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<sup>13</sup> Brett Garsed, *Rock Fusion*, Miami: Warner Bros. Publications Inc, 1995.

<sup>14</sup> Observed in Allan Holdsworth, *REH Instructional Video*, Seattle: R.E.H. Publications Inc, 1992. ; Brett Garsed, *Rock Fusion*, Miami: Warner Bros. Publications Inc., 1995.

<sup>15</sup> Romeo, Michael, *The Guitar Chapter*, Japan, YG Factory Inc., 2000. ; Joe Stump, *Arpeggio Lesson Volume 1*, USA: Digital Dad 65 Productions, 2003.

## 1.2 Historical and technical review

### 1.2.1 Introduction

To first gain an understanding of the innovations that have occurred in electric guitar technique, it is essential to understand certain historical aspects of the instrument. This places electric guitar technique in its modern context, illustrating its practical application in a musical framework. Moreover, to a certain extent an understanding of where electric guitar technique has evolved from, can aid in developing a methodology applicable to the *Caprices*.

### 1.2.2 Cultural History

Virtuosity and its relationship to classical music had particular appeal to electric guitarists in the 1970s and 80s for a number of reasons.<sup>16</sup> One reason was a drive to elevate the status of the instrument to equal classical virtuoso instruments such as the violin. Seeking such legitimization was not uniformly productive<sup>17</sup> and one could question why guitarists sought to acquire technical facility of this sort and why virtuosity should be such a desired goal. On balance, however, one can say that the movement revealed that the theoretical and technical demands of classical study could serve to increase the scope of the electric guitar's voice rather than impair it.<sup>18</sup> Moreover, the ability to read music to a high level undoubtedly encourages composers to write for an instrument. To advance technical progression and to provide technical repertoire in the way that is addressed in this study, expands the potentially limited dimension of the electric guitar

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<sup>16</sup> Robert Walser, *Running with the Devil: Power, Gender, and Madness in Heavy Metal Music*, USA: Wesleyan University Press, 1993, p. 58.

<sup>17</sup> *Ibid*

<sup>18</sup> Walser, *Running with the Devil: Power, Gender, and Madness in Heavy Metal Music*, p. 59.



from a purely aural base to embrace score reading as the starting point to discover a wider range of genres and a new involvement with the creative process.

### 1.2.3 Technical innovators of the 1960s and 1970s

The electric guitar is one of the most popular musical instruments in the Western world. Its rapid rise in popularity is due to many factors, one of the more pertinent in this period of time being the mystique surrounding the “guitar hero”.<sup>19</sup>

The most notable of all the guitar cult heroes<sup>20</sup> was Jimi Hendrix, arguably the greatest electric guitarist of all time.<sup>21</sup> From his initial appearance on the music scene his impact has been apparent with his flamboyant<sup>22</sup> and often outrageous stage antics.<sup>23</sup> Irrespective of the heavy commercial pressures he experienced,<sup>24</sup> his spontaneous<sup>25</sup> and frequently erratic<sup>26</sup> approach to electric guitar playing was reflected in his often disorganized recording sessions.<sup>27</sup>

His command of the heavy blues style helped to pioneer today's advanced electric guitar technique. His influences can be seen in pentatonic phrases,<sup>28</sup> vibrato,<sup>29</sup> dampening,<sup>30</sup>

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<sup>19</sup> Steve Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*. Cambridge, Massachusetts, London: Harvard University Press, 2001, p. 238.

<sup>20</sup> *Ibid*

<sup>21</sup> Alan Di Perna, ‘Axes to Grind’. *Guitar World*, Vol. 15, No. 7, July 1995, pp. 50-186.

<sup>22</sup> Chris Welch, *Hendrix*. Wellington: Alister Taylor Publishing Ltd, 1973, p. 7.

<sup>23</sup> Although often seen as the first one to act so outrageously on stage, guitarists such as Eddie ‘Guitar Slim’ Jones had been performing like this in the United States two decades before. Charles Shaar Murray, ‘Strat Cats’. *Guitar World*, Vol. 12, No. 6, July 1991, pp. 80-120.

<sup>24</sup> Andy Aledort, ‘Electric Landlord’. *Guitar World*, Vol. 15, No. 7, July 1995, pp. 59-183.

<sup>25</sup> *Ibid*

<sup>26</sup> John McDermott, ‘Castles Made of Sound’. *Guitar World*, Vol. 15, No. 7, pp. 66-189.

<sup>27</sup> Aledort, ‘Electric Landlord’, pp. 59-183.

<sup>28</sup> Heard in ‘Bruce’s solo’, Racer X, *Live Extreme Volume*, Shrapnel Records, Inc., SH-1038, 1988.

<sup>29</sup> Heard in ‘Overture 1622’, Yngwie J Malmsteen, *Eclipse*, PolyGram Records, Inc., 843 361-2, 1990. ; ‘Leviathan’, Yngwie J Malmsteen, *Fire and Ice*, Elektra Entertainment, 7559-61137-2, 1992.

<sup>30</sup> Heard in ‘The Raven’, Tony MacAlpine, *Edge of Insanity*, Shrapnel Records, Inc., SH-1021, 1985. ; ‘Prelude/Into the Future’, Vinnie Moore, *Time Odyssey*, Squawk, Inc., 834 634-2, 1988.

and string bends<sup>31</sup> of modern technicians, many of whom cite him as a major influence.<sup>32</sup> Hendrix changed the perception of the electric guitar as an instrument, pushing guitar boundaries and inspiring others to do likewise.

Jeff Beck was another key figure, whom Jimmy Page once described as “one of the greatest guitarists to have emerged from rock and roll”.<sup>33</sup> Both Beck and Page grew up in Surrey, with Page recommending Beck for the job in the Yardbirds,<sup>34</sup> which he took after leaving his band the Tridents.<sup>35</sup>

A showman in his own right,<sup>36</sup> Beck worked as a session guitarist in the 1960s around London before joining the Yardbirds and touring Europe with Page.<sup>37</sup> He later left to pursue a solo career gathering around him a succession of different band line-ups.<sup>38</sup> Beck also became known for his outrageous stage antics,<sup>39</sup> during which he demolished guitars and blew up amplifiers.<sup>40</sup> Nonetheless, his unique use of pentatonic phrasing,<sup>41</sup> whammy bar phrasing,<sup>42</sup> slide guitar,<sup>43</sup> chicken picking,<sup>44</sup> combined with a unique melodic feel, gave him a distinctive sound. Beck arrived at a point in his career where he was content that his job of delivering blues to a white audience was complete.<sup>45</sup> This

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<sup>31</sup> Heard in ‘Disciples of Hell’, Yngwie J Malmsteen, *Marching Out*, Polydor, 825 733-2, 1985. ; ‘Quarter to Midnight’ (live solo), MacAlpine, *Edge of Insanity*, 1985.

<sup>32</sup> Satriani, *The Satch Tapes*, 1992.

<sup>33</sup> Jas Obrecht, ‘Jeff Beck’. *Guitar Player*, Vol. 14, No. 10, October 1980, pp. 56-86.

<sup>34</sup> Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*, p. 244.

<sup>35</sup> Murray, ‘Strat Cats’, pp. 80-120.

<sup>36</sup> *Ibid*

<sup>37</sup> Obrecht, ‘Jeff Beck’, pp. 56-86.

<sup>38</sup> Some of these include Stanley Clark, Simon Philips, Jeff Bogart and Jan Hammer.

<sup>39</sup> Murray, ‘Strat Cats’, pp. 80-120.

<sup>40</sup> Obrecht, ‘Jeff Beck’, pp. 56-86.

<sup>41</sup> Heard in Star Cycle, Jeff Beck, *There and Back*, FE-35684, Epic, 1980.

<sup>42</sup> Heard in Pump, Beck, *There and Back*, 1980.

<sup>43</sup> Obrecht, ‘Jeff Beck’, pp. 56-86.

<sup>44</sup> Murray, ‘Strat Cats’, pp. 80-120.

<sup>45</sup> Obrecht, ‘Jeff Beck’, pp. 56-86.

allowed him to continue to experiment with technique, vowing to further expand both the boundaries of rock music and of the electric guitar.<sup>46</sup>

Beck retained his individuality in the face of commercialism, whilst remaining on the cutting edge of technique in whatever style he performed.<sup>47</sup> This fact is seen in the contrasting genres of music that appear on what have now become renowned as classic albums, all of which feature his unique trademark Stratocaster sound. In the 1970s he helped contribute to the field of electric guitar fusion with albums such as *Wired*,<sup>48</sup> *Blow by Blow*,<sup>49</sup> and *There And Back*.<sup>50</sup> The accessibility of Beck's music to the general listening audience has immortalized him as a major influence from the 1970s until the present day, most notably to the guitar innovator Eddie Van Hallen.<sup>51</sup>

Not all influential guitarists however, came from a solo career background. In the 1960s and 70s, rock band culture was a dominant market force in record sales. Consequently, guitarists from these bands were extremely influential in the evolution of technique.

Led Zeppelin's record sales over two decades are an obvious indication of the group's far-reaching influence on popular culture.<sup>52</sup> The mainstay of the band was guitarist Jimmy Page with his driving rifts,<sup>53</sup> and his bridging of the acoustic/electric divide.<sup>54</sup>

Already a sought-after session player before he was sixteen, Page's experience

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<sup>46</sup> *Ibid*

<sup>47</sup> *Ibid*

<sup>48</sup> Jeff Beck, *Wired*, Epic, PE 33849, 1976.

<sup>49</sup> Jeff Beck, *Blow by Blow*, Epic, PE 33409, 1975.

<sup>50</sup> Jeff Beck, *There and Back*, Epic, 1980.

<sup>51</sup> Eddie Van Halen compares his approach to Beck's stating ... "Beck and I approach the guitar in kind of a spontaneous over the edge kind of way", John Stix, 'Life at the Top'. *Guitar Classics Special Edition*, Vol. 11, 1995, pp. 10-100.

<sup>52</sup> Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*, p. 238.

<sup>53</sup> *Ibid*

<sup>54</sup> Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*, p. 239.

contributed to the band's sound through production techniques,<sup>55</sup> experimental sounds<sup>56</sup> and unique tonality.<sup>57</sup> Use of a violin bow<sup>58</sup> on 'Dazed and Confused',<sup>59</sup> and the use of a Theremin on 'Whole Lotta Love' are two such examples.<sup>60</sup>

His experience in the studio gave him the expertise to engineer and produce the classic Zeppelin sound on such songs as 'Stairway To Heaven',<sup>61</sup> 'The Lemon Song',<sup>62</sup> 'Kashmir',<sup>63</sup> 'Nobody's Fault But Mine',<sup>64</sup> and 'The Immigrant Song'.<sup>65</sup> The band's studio and live sound largely revolved around John Bonham's drums, which were highlighted by Page's production and recording techniques.<sup>66</sup> Page saw the value of a strong rhythm section, composing specifically to exploit the "groove" playing that had developed between Bonham and John Paul Jones (bass).

Page was not merely a guitar innovator but an all-round musician, arranger and composer even being compared to Paganini.<sup>67</sup> Recognized as an innovator, his syncopated riffs, heavy use of guitar polyphony and rhythmic and melodic phrasing, continue to influence main-stream guitarists and innovators alike.

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<sup>55</sup> *Ibid*, "...the brains behind Zeppelins sonic brawn."

<sup>56</sup> Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*, p. 240.

<sup>57</sup> *Ibid*, Page referred to these as "CIA" influences; Celtic, Indian, and Arabic.

<sup>58</sup> Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*, p. 241.

<sup>59</sup> Led Zeppelin, *Led Zeppelin*, Atlantic Records, SD 8216, 1969.

<sup>60</sup> Led Zeppelin, *The song remains the same*, Swan Song Records, SS 2-201, 1976.

<sup>61</sup> Led Zeppelin, *Led Zeppelin IV*, Atlantic Records, SD 7208, 1971.

<sup>62</sup> Led Zeppelin, *Led Zeppelin II*, Atlantic Records, SD 8236, 1969.

<sup>63</sup> Led Zeppelin, *Physical Graffiti*, Swan Song Records, SS 2-200, 1975.

<sup>64</sup> Led Zeppelin, *Presence*, Swan Song Records, SS 8416 0698, 1976.

<sup>65</sup> Led Zeppelin, *Led Zeppelin III*, Atlantic Records, SD 7201, 1970.

<sup>66</sup> Brad Tolinski, 'Jimmy Page'. *Guitar World*, Vol. 15, No. 5, May 1995, pp. 109-112.

<sup>67</sup> Chris Welch referred to Page as the "Paganini of the 70s". Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*, p. 240.

Another rock giant, Deep Purple's contribution to popular music of its time was also invaluable.<sup>68</sup> The band's guitarist Ritchie Blackmore was stylistically very different to Page. Where Page was heavily influenced by the blues, most apparent in the early Led Zeppelin albums, Blackmore introduced guitar players to the intricacies of the classical medium within the band's music.<sup>69</sup> This was manifested in solos and melody lines from one end of the spectrum to the other including fast heavy tunes such as 'Burn',<sup>70</sup> and 'Highway star',<sup>71</sup> and slow melodic songs such as 'Soldier of Fortune',<sup>72</sup> and 'Child in Time',<sup>73</sup>

Blackmore also helped pioneer the trade offs of "licks" and "riffs" between the keyboard (Jon Lord) and guitar, something that Yngwie Malmsteen and others were to develop in the 1980s. Blackmore's well-documented volatile nature arguably contributed to his emotive and sometimes erratic guitar solos.

As well as introducing a unique approach to guitar technique, he used a melodic and harmonic vocabulary that complemented these technical innovations. Much of the guitar solo vocabulary in the 1960s had a firm grounding in blues. More specifically, melodic and harmonic content largely revolved around the pentatonic scale. Guitarists predominantly used the first and third fingers to execute this scale due to its box-like shape on the guitar neck.<sup>74</sup> However, with Deep Purple's release of 'Concerto for Group

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<sup>68</sup> Walser, *Running with the Devil: Power, Gender, and Madness in Heavy Metal Music*, p. 61.

<sup>69</sup> *ibid*

<sup>70</sup> Deep Purple, *Burn*, Warner Bros, W-2766, 1974.

<sup>71</sup> Deep Purple, *Machine Head*, Warner Bros, WB BS 2607, 1972.

<sup>72</sup> Deep Purple, *Stormbinger*, Warner Bros, PRK 2832 1974.

<sup>73</sup> Deep Purple, *In Rock*, Warner Bros, WS 1877, 1970.

<sup>74</sup> Paul Gilbert, *Intense Rock*, Seattle: R.E.H. Publications Inc., 1988.

and Orchestra',<sup>75</sup> Blackmore started to exhibit a more progressive approach to widening the musical boundaries of the electric guitar; a concept mirrored by the release of Yngwie J Malmsteen's 'Concerto Suite for Electric Guitar and Orchestra'.<sup>76</sup>

Blackmore's fluency when using harmonic minor, natural minor and major scales, resulted in solos that often exhibited a distinctive modal flavor. However, his technical inadequacies can be heard on a number of tracks, most notably 'Burn',<sup>77</sup> where he struggles to maintain consistency whilst playing over a descending cycle of fifths. Blackmore's technical and harmonic vocabulary set the groundwork for many of the more technique orientated players of today.

Black Sabbath is another band largely recognized for its impact and development of rock and heavy metal music. Consequently, the band's guitarist Tony Iommi has received similar acclaim for his influence on many modern-day guitarists. Similar to Page and Blackmore, Iommi epitomized Black Sabbath's music with his use of heavy guitar riffs. His distinctive sound is owed largely to his original and innovative (at the time) approach of detuning his guitar.<sup>78</sup> The loose strings added a distinguishing dark sounding quality to the riffs, which helped to immortalize Iommi to many guitarists.<sup>79</sup>

Stylistically different, Iommi utilizes his first and four fingers extensively to play pentatonic shapes and phrases. These would more traditionally be played with the first

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<sup>75</sup> Deep Purple, *Concerto for Group and Orchestra*, Harvest, SHVL 767, 1969.

<sup>76</sup> Yngwie J Malmsteen, *Concerto Suite for Electric Guitar and Orchestra*, Japan: Pony Canyon, PCCL-00424, 1998.

<sup>77</sup> Deep Purple, *Burn*, 1974.

<sup>78</sup> Brad Tolinski and Alan Paul, 'Tony Iommi and James Hetfield'. *Guitar World*, Vol. 15, No. 5, May 1995, pp. 65-69.

<sup>79</sup> *Ibid*

and third fingers.<sup>80</sup> A reason for this fingering can be traced to the accident that cut off the ends of his fingers.<sup>81</sup> In order to continue playing he utilizes thimbles<sup>82</sup> to replace his missing finger tips.<sup>83</sup> He can often be seen relying on his first and fourth fingers for power chord and lead solo playing.<sup>84</sup> This accident also affects Iommi's ability to bend the string effectively, resorting to the use of the lighter gauge 008s to better facilitate this action.<sup>85</sup> Much of Iommi's rift and lead guitar playing technique heavily revolves around the pentatonic scale. His influence can be seen when examining power chord playing of present day guitarists, many of whom use a similar first and fourth finger combination.

#### **1.2.4 Summary**

Deep Purple, Black Sabbath and Led Zeppelin are considered the pioneers of heavy metal and rock, the musical style from where many of the technical innovators of the 1980s were to develop. Band guitarists in conjunction with solo artists such as Hendrix and Beck, are continually cited for their contribution to the 1980s' 'guitar revolution' that was to follow. Although there are many other guitarists from this era, the aforementioned are arguably more influential from a technical perspective.

#### **1.2.5 Technical innovators of the 1980s and 1990s**

The vastly contrasting styles of Alan Holdworth and Al Di Meola have spanned a period of time from the late 60s and early 70s respectively, to the present day. Although not strictly fitting into the 80s and 90s timeframe, Holdworth and Meola have made valuable contributions to the evolution of technique throughout. Both are widely acknowledged

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<sup>80</sup> Observed in Tony Iommi, *Tony Iommi*, New York: Star Licks Productions, 1984.

<sup>81</sup> Tolinski and Paul, 'Tony Iommi and James Hetfield', pp. 65-69.

<sup>82</sup> *Ibid*

<sup>83</sup> Iommi, *Tony Iommi*, 1984.

<sup>84</sup> Observed in Iommi, *Tony Iommi*, 1984.

<sup>85</sup> Tolinski and Paul. 'Tony Iommi and James Hetfield', pp. 65-69.

jazz/fusion guitarists, with Meola's Spanish and Latin influences<sup>86</sup> contrasting with Holdsworth's progressive compositions and improvisational work.<sup>87</sup>

Meola has long been recognized for his aggressive alternate-picking approach to improvisation and electric guitar soloing.<sup>88</sup> Developed in conjunction with this, is his formidable dampening technique.<sup>89</sup> This allows individual notes to attain maximum impact whilst controlling the tone and amplitude of the string.<sup>90</sup> Chordal picking and chordal strumming are also two of his technical strong points, possibly developed by his time in Chick Corea's band, Return to Forever.<sup>91</sup> Meola can be seen further developing this style in his collaboration with flamenco master Paco De Lucia and Mahavishnu Orchestra's leader John McLaughlin.<sup>92</sup> This collaboration produced critically acclaimed performances and subsequent albums.<sup>93</sup>

Holdsworth on the other hand can arguably be described as less structured and more free-flowing. His *legato* technique and economy of motion<sup>94</sup> in conjunction with symmetrical fingering patterns<sup>95</sup> can make it extremely difficult to grasp the tonal center of many of his guitar solos. This tonal ambiguity in conjunction with nontraditional chord voicings,

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<sup>86</sup> Heard in 'Mediterranean Sundance' and 'Lady of Rome, Sister of Brazil', Al Di Meola, *Elegant Gypsy*, CBS, Inc., CK 34461, 1977.

<sup>87</sup> Wikipedia, 'Allan Holdsworth', [http://en.wikipedia.org/wiki/Allan\\_Holdsworth](http://en.wikipedia.org/wiki/Allan_Holdsworth); accessed on 29<sup>th</sup> May, 2007.

<sup>88</sup> Al Di Meola, 'Picking with Al Di Meola'. *Guitar Player*, Vol. 20, No. 2, February 1986, pp. 64-68.

<sup>89</sup> Observed in Al Di Meola, *Masters Series*, Seattle, R.E.H. Publications Inc., 1991.

<sup>90</sup> *Ibid*

<sup>91</sup> Corea's obvious Spanish influences heard in Chick Corea, *My Spanish Heart*, Polydor, PD-2-9003, 1976.

<sup>92</sup> Tom Wheeler, 'A Victory for the Acoustic Guitar'. *Guitar Player*, Vol. 15, No. 3, March 1981, pp. 70-82.

<sup>93</sup> Al Di Meola, *Friday Night in San Francisco*, CBS, Inc., CK 37152, 1981.

<sup>94</sup> Observed in Holdsworth, *REH Instructional Video*, 1992.

<sup>95</sup> *Ibid*



volume swells and extremely light *legato* technique, make Holdsworth's pioneering approach instantly recognizable, influencing many guitarists throughout his long career.<sup>96</sup>

The 1980s was a key period in the development of the electric guitar. In early 1978, Van Halen released their first self-titled album,<sup>97</sup> containing the solo guitar piece 'Eruption'. This solo can be seen as instrumental in sparking the technical revolution of the 1980s. It was also pivotal in terms of guitarist Eddie Van Halen's career, gaining him recognition as one of the foremost innovators in his field.<sup>98</sup> Moreover, this solo is frequently cited by experts<sup>99</sup> as one of the most influential of all time.<sup>100</sup>

Eddie Van Halen's double-handed approach used hammer-ons and pull-offs to create a unique sound, one that was to be copied throughout the 1980s. His style of finger-tapping enabled widespread triadic and 7<sup>th</sup> chord arpeggios, unreachable by one hand on one string, to be played at speeds thought to be impossible using traditional techniques. Application of this within pentatonic scales, modes and arpeggios, gave his solos an original harmonic and melodic sound.

Other techniques that he was responsible for popularizing were harmonic tapping<sup>101</sup> and trem-picking.<sup>102</sup> Irrespective of Van Halen's use of trem-picking, he is not widely recognized as a fast alternate picker. Trem-picking requires very little articulation and

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<sup>96</sup> One notable example being Garsed, *Rock Fusion*, Miami, 1995.

<sup>97</sup> Van Halen, *Van Halen*, Warner Bros. Records, KBS-3075, 1978.

<sup>98</sup> Garsed, *Rock Fusion*, 1995.

<sup>99</sup> Wikipedia, 'Eruption', [http://en.wikipedia.org/wiki/Eruption\\_\(song\)](http://en.wikipedia.org/wiki/Eruption_(song)); accessed 29<sup>th</sup> May, 2007.

<sup>100</sup> In the top 100 guitar solos Guitar World poll has it coming in second. Guitar World, '100 Greatest Guitar Solos', <http://guitar.about.com/library/bl100greatest.htm>; accessed 29<sup>th</sup> May, 2007.

<sup>101</sup> The tapping out of notes a harmonic interval above the fretted note. Heard on the track 'Spanish Fly', Van Halen, *Van Halen 2*, Warner Bros. Records, HS-3312, 1979.

<sup>102</sup> The picking of one note repetitively. A notable example of which is heard on the track 'Eruption', Van Halen, *Van Halen*, 1978.

synchronization between the hands and the individual picking strokes. Much of his style is hammer-on and pull-off based, which develops out of blues and rock and roll,<sup>103</sup> examples of which can be seen in such songs as 'Ice-cream Man' and 'Eruption'.<sup>104</sup> The minor-third bends and modal three-notes-per-string scales combined with extreme vibrato left many of his colleagues in awe of his natural abilities. Eddie Van Halen's style was fluent, innovative and extremely effective.<sup>105</sup>

Next to Van Halen, Yngwie Malmsteen can arguably be classified as one of the all-time great electric guitar innovators. Influenced from an early age by Jimi Hendrix and Richie Blackmore,<sup>106</sup> Malmsteen quickly tired of guitar music, being drawn to the beauty of Bach and the virtuosity of Paganini.<sup>107</sup> This influence was to follow him the rest of his life, manifesting itself in his compositions and tonality.<sup>108</sup> Malmsteen became instantly recognizable using techniques such as fast alternate-picking, sweep-picked arpeggios and pedal point playing. His application of these techniques in conjunction with harmonic, melodic and diminished scales,<sup>109</sup> gave him a unique musical edge over many of his contemporaries.

Renowned producer Mike Varney provided Malmsteen with his first musical opportunity in the USA.<sup>110</sup> From that point on Malmsteen was responsible for introducing a more

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<sup>103</sup> Van Halen stated "When I stumbled into it I said, hey, this is what they're doing in the blues. I said great, I know these notes, and I just kind of expanded from there." Stix, 'Life At The Top', pp. 10-100.

<sup>104</sup> *Ibid*

<sup>105</sup> His tonality and timbre captured by the same man that captured Jimmy Pages sound and that of Led Zeppelin, Andy Johns. Brad Tolinski, 'Lord of the Strings'. *Guitar World*, Vol. 12, No. 9, September 1991, pp. 72-106.

<sup>106</sup> Obrecht, 'Rising Force', pp. 58-74.

<sup>107</sup> *Ibid*

<sup>108</sup> Heard in Yngwie J Malmsteen, *Concerto Suite for Electric Guitar and Orchestra*, 1998.

<sup>109</sup> Jas Obrecht, 'Yngwie Malmsteen'. *Guitar Player*, Vol. 26, No. 1, January 1992, pp. 76-77.

<sup>110</sup> The same person responsible for discovering technique orientated guitarists such as Paul Gilbert, Paul Gilbert, *Terrifying Guitar Trip*, Miami: Warner Bros. Publications Inc., 1995.

disciplined classical approach to the electric guitar fraternity. This is most notably demonstrated on his first solo album<sup>111</sup> which revealed him as a well-rounded musician. Although he had already recorded previous albums with Steela and Alcatrazz, *Rising Force* was his first solo project. On this album he played both electric bass and guitar, recording the entire disc in less than a week with an imported drummer that he had not played with previously.<sup>112</sup> On the disc he demonstrates not only fast rhythmic riff and solo playing, but also a total command of dynamics and string tone. Mostly instrumental in content, the compositions are used as a vehicle for both improvisational expression and technical elaboration.

The difficulty presented by using a scalloped finger-board, Floyd Rose tremolo,<sup>113</sup> and detuned guitar (down one semitone)<sup>114</sup>, makes the speed of his execution more impressive.<sup>115</sup> The influence that this disc had on the general guitar populace was undeniable, being praised by guitarists such as Joe Satriani for his contribution to popularizing scales and arpeggios.<sup>116</sup>

Largely precipitated by Yngwie Malmsteen, neo-classical electric guitar playing gained popularity in the mid 1980s, further pushing compositional and technical boundaries. From the plethora of technique-orientated guitarists that had arisen, a small number emerged that distinguished themselves from the rest, one of whom was the classically trained pianist Tony MacAlpine.

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<sup>111</sup> Yngwie J Malmsteen, *Rising Force*, Polydor, 825 324-2, 1984.

<sup>112</sup> Obrecht, 'Rising Force', pp. 58-74.

<sup>113</sup> *Ibid*

<sup>114</sup> Heard throughout the album *Rising Force*, Malmsteen, *Rising Force*, 1984.

<sup>115</sup> "Use of a scalloped finger-board is much harder to play and stay in tune", Obrecht, 'Rising Force', pp. 58-74. ; Yngwie J Malmsteen, *Masters Series*, Seattle: R.E.H. Publications Inc., 1991.

<sup>116</sup> Obrecht, 'Yngwie Malmsteen' pp. 76-77.

Trained as a pianist from an early age, he quickly learned the value of combining classical discipline with rock music.<sup>117</sup> MacAlpine took up Malmsteen's lead, combining speed with unpredictable melodic twists, giving him an aggressive rock sound which never detracted from his musicianship. His plectrum technique reached an advanced state of development far beyond most normal players.<sup>118</sup> This can be seen most notably in his extensive use of cyclic rotations, a technique that MacAlpine often exploited during solos.<sup>119</sup>

MacAlpine was not the only guitar player to emerge from the post-Malmsteen period. The Guitar Institute of Technology in Hollywood was reaching a high point, producing a multitude of talented guitarists, one of the most notable being Paul Gilbert.

Gilbert proved his exceptional plectrum technique on his first instructional video whilst the opening credits played.<sup>120</sup> After graduating from GIT he became a lecturer and columnist for *Guitar Player* in the early 1990s, producing a column named 'Terrifying Guitar 101'. It was at GIT that Gilbert met Bruce Bouillet and formed what is widely renowned as one of the most impressive "guitar techniques" bands, Racer X.

Both Gilbert and Bouillet displayed impressive plectrum technique.<sup>121</sup> Their complementary styles excelled in the solo sections with Gilbert's use of alternate-picking and string-skipping and Bouillet's equally impressive plectrum technique and sweep-

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<sup>117</sup> Chopin Etudes Heard on Tony MacAlpine, *Edge of Insanity*, 1985, Tony MacAlpine, *Maximum Security*, Squawk Inc., 832 249-2 Q-1, 1987.

<sup>118</sup> Observed in Tony MacAlpine, *Master Sessions*, New York: Star Licks Productions, 1992.

<sup>119</sup> Tony MacAlpine, *Guitar Lessons*, Cotati, California: Shrapnel Publications, 1990.

<sup>120</sup> Gilbert, *Intense Rock*, 1988.

<sup>121</sup> Heard in both 'Bruce's Solo' and 'Paul's Solo' on Racer X, *Live Extreme Volume*, 1988.

picked arpeggios. Many of their songs feature dual harmonized leads<sup>122</sup> in addition to trade off guitar solos and harmonized riffs in the tradition of Iron Maiden's 'The Trooper'<sup>123</sup> and Thin Lizzy's 'Don't Believe a Word'.<sup>124</sup>

The fast harmonized single-note guitar melodies that Bouillet and Gilbert perform as a duo are precise and uniform, even down to the amount of dampening, vibrato and pinch harmonics used. A notable example of this is the instrumental 'Scarified',<sup>125</sup> which exemplifies synchronized guitar harmonies. The track uses alternate-picking, sequenced arpeggios, sweep-picking, finger-tapping and string-skipping, executed with strict attention to detail, clarity and string tone. Moreover, they show Gilbert's mastery of dynamics and dampening when using distortion.

Following in Al Di Meola traditions of the Berkeley alumnus,<sup>126</sup> Steve Vai began his musical career working as a guitar transcriber for Frank Zappa.<sup>127</sup> His excellent ear and technical ability helped Vai to fit into a number of diverse musical situations, from Frank Zappa's band and White Snake,<sup>128</sup> to his replacement of Malmsteen in Alcatraz.<sup>129</sup>

His first solo album<sup>130</sup> revealed an exciting potential, providing insight into his early musical education received from former teacher Joe Satriani.<sup>131</sup> His use of pinch

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<sup>122</sup> Heard in 'Sunlit Nights', Racer X, *Live Extreme Volume 2*, Shrapnel Records, Inc., SH-1059-2, 1992.

<sup>123</sup> Iron Maiden, *Peace of Mind*, EMI, 4969190, 1983.

<sup>124</sup> Thin Lizzy, *Johnny the Fox*, Mercury, SRM 1119, 1976.

<sup>125</sup> Racer X, *Second Heat*, 1988.

<sup>126</sup> Jas Obrecht, 'Steve Vai'. *Guitar Player*, Vol. 20, No. 10, October 1986, pp. 74-154.

<sup>127</sup> Tom Mulhern, 'Steve Vai'. *Guitar Player*, Vol. 17, No. 2, February 1983, pp. 80-124. ; Obrecht, 'Steve Vai', pp. 74-154.

<sup>128</sup> Steve Vai replaced Adrian Vandenberg after he injured his hand for the *Slip of the Tongue* album. Whitesnake, *Slip of the Tongue*, EMI, SKU: 24249, 1996.

<sup>129</sup> Obrecht, 'Rising Force', pp. 58-74.

<sup>130</sup> Vai, Steve. *Flex-able*, Akashic Records, UR777-2, 1984.

<sup>131</sup> Satriani, *The Satch Tapes*, 1992.

harmonics and exploitation of string harmonics combined with whammy bar phrasing,<sup>132</sup> gives Vai's guitar playing an instantly recognizable sound.

Vai's melodic phrases are continually punctuated by expressive and arguably excessive use of note colourings.<sup>133</sup> These are further accentuated by his use of the guitar's bridge pickup. However, his contribution to the electric guitar is not limited to technique. He was instrumental in the design and popularization of the seven-string guitar, the Ibanez Universe. Vai's use of the Universe on albums such as *Passion and Warfare*<sup>134</sup> makes his contribution to the electric guitar above and beyond technical innovation.

Although very different from Steve Vai, Frank Gambale is recognized for his role in developing the sweep-picking technique.<sup>135</sup> His minimalist approach to picking economizes the plectrum motion, reducing it substantially for both scales and arpeggios.<sup>136</sup> Moreover, this method reduces the amount of picking patterns that are required in learning scales and arpeggios.<sup>137</sup>

The electric guitar's tuning makes playing arpeggios with alternate-picking considerably inefficient. This is due to continual movement to the adjacent string with opposite stroke motion.<sup>138</sup> Sweep-picking utilizes multiple strokes in the same direction similar to a rest stroke,<sup>139</sup> which effectively increases the notes speed and fluidity. Revolutionary in its

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<sup>132</sup> Heard in 'Painted Lover', Alcatrazz, *Disturbing the Peace*, Capitol Records, ST-12385, 1985.

<sup>133</sup> Obrecht, 'Steve Vai', pp. 74-154.

<sup>134</sup> Steve Vai, *Passion and Warfare*, Relativity Records, Inc., 88561-1037-2, 1990.

<sup>135</sup> Frank Gambale, *Monster Licks and Speed Picking*, New York: D.I.C. Publication, 1988.

<sup>136</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>137</sup> *Ibid*

<sup>138</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>139</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

approach, sweep-picking was adopted by many guitarists in the 1980s and through to the present day.

Following in the footsteps of Eddie Van Halen and his two-handed approach, Stanley Jordan took the double-handed concept to an extreme, treating the guitar with an almost pianistic technique.<sup>140</sup> Jordan's touch technique<sup>141</sup> is an advanced form of finger-tapping that facilitates the ability to perform true polyphony on the electric guitar. In order to achieve this, both hands function autonomously, similar to the way that they do on a piano.<sup>142</sup> This approach was so effective that there is a note on the first album, produced by Al Di Meola, stating that there are no overdubs.<sup>143</sup> Jordan's skill in controlling and balancing dynamic variations is best seen in Bach's two-part invention, balancing harmony, melody and dynamic between the two hands.<sup>144</sup>

### **1.2.6 Summary**

The 1980s and 1990s were a definitive time period for electric guitar development and more specifically the development technique. Many players from this period in time continue to perform and record to the present day. Consequently, their influence on the continued technical development process is ongoing.

### **1.2.7 Historical/technical summary**

The history of electric guitar and its innovative figures and influences provides the modern guitarist with a broad technical pallet on which to build. Moreover, having a

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<sup>140</sup> Jim Ferguson, 'Stanley Jordan'. *Guitar Player*, Vol. 19, No. 10, October 1985, pp. 82-149.

<sup>141</sup> Stanley Jordan, *Master Sessions*, New York: Star Licks Productions, 1993.

<sup>142</sup> *Ibid*

<sup>143</sup> Stanley Jordan, *Magic Touch*, Manhattan Records, CDP 7 46092 2, 1985.

<sup>144</sup> Observed in Jordan, *Master Sessions*, 1993.

clear understanding of individual technical innovations, their evolution and practical application, is vital when adapting and applying techniques to other musical genres.

Recognizing the drawbacks of literature, visual media and recorded music, in the development of technique, can minimize its inadequate application. For this reason a broadly balanced investigation of these three types of development literature is necessary.<sup>145</sup> Using visual media to observe technique, literature and transcription to accurately gauge note choice, and a discography to discern practical application, are all of vital importance.

Although many other players influenced the guitar fraternity, the aforementioned have arguably made the greatest technical contribution. Exposure in the literature can be viewed as a significant reason for why those guitarists have made such an impact on technique, when arguably there are many more technically proficient guitarists such as Steve Morse, Rusty Cooley, Vinnie Moore, Michael Angelo, Michael Romeo, Jason Becker and John Petrucci all of which are prominent guitarists in their own right. Periodicals need to achieve maximum distribution, which can best occur when popular guitarists are featured, as opposed to the most technically proficient.

Utilizing the available literature to further push the boundaries of technique, ensure that continued development will occur. Technical innovations and contributions to the electric guitar can be applied to the *Caprices*, provided a good working knowledge of their history and development has been undertaken first.

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<sup>145</sup> A technique used by Malmsteen in his development stage. Obrecht, 'Rising Force', pp. 58-74.



## 1.3 Recording review

### 1.3.1 Introduction

In addition to the information on advanced electric guitar technique, its development and use within the transcriptions, it is also important to be familiar with a range of recorded interpretations of the *Caprices*. These interpretations provide valuable performance insight when approaching the transcription process, which in itself can create limited musical options. Having a familiarization with different recorded performances can influence transposition choices, creating a more informed musical and technical outcome.

There have been a number of notable performances of the Paganini *Caprices*, over the years on violin, viola, cello and guitar. Ruggiero Ricci, the first violinist to do a complete recording of the *Caprices*,<sup>146</sup> spent a good portion of his career building a reputation playing Paganini's works.

Of the original violin version there have been some outstanding recordings. One of the more prominent performances is given by the virtuoso Itzhak Perlman in 1972.<sup>147</sup>

Throughout the recording, Perlman proves he is in a class of his own as he presents his trademarked mix of technical control and artistic expression. For example, notes are evenly articulated during the series of runs in 'Caprice No. 5' in A minor, in addition to producing the difficult *ricochet* bowing in 'Caprice No.1'.<sup>148</sup> However as brilliant as

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<sup>146</sup> Wikipedia, 'Ruggiero Ricci', [http://en.wikipedia.org/wiki/Ruggiero\\_Ricci](http://en.wikipedia.org/wiki/Ruggiero_Ricci); accessed 3<sup>rd</sup> June 2007. ; Ricci, Ruggiero. *24 Caprices, Op 1*, Turnabout, TV-S 34528, 1973.

<sup>147</sup> Wikipedia, 'James Ehnes', [http://en.wikipedia.org/wiki/James\\_Ehnes](http://en.wikipedia.org/wiki/James_Ehnes); accessed 3<sup>rd</sup> June 2007.

<sup>148</sup> Itzhak Perlman, *24 Caprices*, EMI Great Recordings of the Century, CDM67257, 2000.

these recordings were, James Ehnes' recordings of the *Caprices*<sup>149</sup> were internationally acclaimed as the first that could rival those produced by Perlman.<sup>150</sup>

The Japanese virtuoso Midori, at the age of seven, performed her first Paganini *Caprice*, and at age 19 recorded them in their entirety.<sup>151</sup> The comparison of Midori's recording of the Paganini *Caprices* to several other recordings reveals that it has a "live" sound quality to it. Midori performs with a sparkling tone, impeccable intonation and a technical maturity unique to her age. One of her most outstanding techniques is her mastery of left hand pizzicato.<sup>152</sup>

Midori, Ehnes and Perlman epitomize the technical wizardry in combination with musical maturity that is needed in order to perform the *Caprices* with success. Other violinists such as Stephane Grappeli and Yehudi Menuhin and even the popular music violinist, Vanessa Mae, have made recordings of 'Caprice No. 24'.

Transposing the *Caprices* to different instruments has occurred with varying degrees of success, Yo Yo Ma's performance of a number of the *Caprices* on the cello being a prime example.<sup>153</sup> He performs 'Caprice No. 9, 13, 14, 17 and 24' with both command and feeling. Nevertheless, although his mastery of the cello is beyond question, intonation on the 'Caprice No. 24' in the octave sections can be arguably described as "awkward". In contrast his versions of 'Caprice No. 13' for solo cello and 'Caprice No. 14' with piano accompaniment are extremely well performed. Transposing music so physically

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<sup>149</sup> James Ehnes, *24 Caprices*, Telarc, 80398, 2003.

<sup>150</sup> Wikipedia, 'James Ehnes', [http://en.wikipedia.org/wiki/James\\_Ehnes](http://en.wikipedia.org/wiki/James_Ehnes); accessed 3<sup>rd</sup> June 2007.

<sup>151</sup> Midori Goto, *24 Caprices*, Sony, 92764, 2005.

<sup>152</sup> Heard in 'Caprice 24', Goto, *24 Caprices*, 2005.

<sup>153</sup> Yo Yo Ma, *Kreisler, Paganini*, CBS Masterworks, 37280, 1990.

demanding can often create problems of this nature due to the constraints of traditional technique.

One of the distinguished guitar performances is by the virtuoso Elliot Fisk.<sup>154</sup> His landmark release of the entire set of the *Caprices* performed and arranged by himself for guitar, immediately entered the Billboard charts and elicited acclaim from colleagues and critics the world over.

In addition to Fisk, there have been a number of players that have created different versions of the *Caprices* in varying forms. The ‘Caprice No. 24’ is regularly targeted by many guitar players including the eminent John Williams.

In the target field of electric guitar transcriptions, there are very few recordings of *Caprices* that are notable. Kevin Ferguson in the USA released an album *Strad to Strat* 1995,<sup>155</sup> on which he performs Paganini’s ‘Caprice No.5’ and *Violin Concerto No.1* in D major. The Great Kat did a band version of the ‘Caprice No. 24’ in 1985.<sup>156</sup> However, the performance omits many of the variations and is very poorly played in terms of left and right hand synchronization and string tone.

Steve Vai and Jason Becker also have performed versions of Paganini’s ‘Caprice No. 5’. Becker’s rendition includes alternate-picking and sweep-picking,<sup>157</sup> whilst Vai’s provides the basis rather than a complete rendition for the guitar dual in the movie *Cross Roads*.

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<sup>154</sup> Elliot Fisk, *24 Caprices*, MusicMasters, 67092-2, 1992.

<sup>155</sup> Kevin Ferguson, *Strad to Strat*, DeBone Music, CLCS795, 1995.

<sup>156</sup> The Great Kat, *Beethoven on Speed*, Road Runner Records, RRD9373, 1990.

<sup>157</sup> Jason Becker, *The Legendary Guitar of Jason Becker*, New York: Hot Licks Productions Inc., 2007.

John Tapella released a performance of the ‘Caprice No. 24’ played in its entirety with an accompanying transcription,<sup>158</sup> along with another Paganini work, *Perpetual Motion* (*Moto Perpetuo*). Although executing the notes correctly the control of the general tone of the strings was less than pristine. In 2005 Tapella also released an album<sup>159</sup> that featured ‘Caprice No. 16’ and ‘Caprice No. 5’, both suffer from certain tone deficiencies and fingering problems that affect note duration, common place in electric guitar playing.

Possibly the most notable electric guitar performance of Paganini is the *Concerto in B minor*, with band and orchestra, arranged by Michael Romeo (Symphony X) from his solo album *The Dark Chapter* 1994.<sup>160</sup> The performance demonstrates an excellent grasp of electric guitar technique, whammy bar use and string bends, combined with the essence of Paganini’s music and modern orchestration.

This researcher has released the album *Light before the Dawn* which includes Paganini’s ‘Caprice No. 16’ for solo electric guitar.<sup>161</sup> This features techniques such as sweep-picking, string-skipping and alternate-picking in conjunction with dampening and distortion.

### **1.3.2 Recording summary**

There are some notable performances on the acoustic guitar, violin and cello.

Transcriptions by Elliot Fisk and John Williams have been recorded, making them easier to play on guitar and although they are excellent performances, they struggle to retain many of the violinistic melody characteristics. The Yo Yo Ma cello transcriptions are

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<sup>158</sup> John Tapella, *Paganini Caprice #24 Perpetual Motion for Electric Guitar*, Guitarempire.com, 2002.

<sup>159</sup> John Tapella, *John Tapella’s Classical Electric Guitar*, Tapella, 634479164989, 2005.

<sup>160</sup> Michael Romeo, *The Dark Chapter*, InsideOut Music, HEL842, 1994.

<sup>161</sup> Altitude, *Light Before the Dawn*, Karma Record Group, 2707101022, 2003.

more successful in that sense, as would be expected due to the similarities between the violin and cello.

There are very few transcriptions of any of the *Caprices* to the electric guitars. Those that have occurred have struggled with technical issues, often being forced to transpose sections or omit parts. This is one of the issues that a full transcription of the *Caprices* will address, whilst advancing both the technical development and improving the overall accessibility of them for the electric guitarist.

## **1.4 Chapter Summary**

Drawing on the aforementioned media allows insightful and informed decisions to be made at the transcription stage, whilst avoiding any inherent dangers. When using media such as DVDs, transcriptions, discographies and guitar periodicals, it is possible to gain insight into both electric guitar technique and its practical application.

An awareness of the historical aspects of the electric guitar and technical evolution is also necessary. Placing the electric guitar in its modern and historical context allows insight into the evolution and development of technique from its embryonic stage to the present day. This perspective also reveals pivotal technical periods in history and illustrates why these periods are of profound importance. Additionally, this perspective also reveals key figures and their contribution to technique and electric guitar playing in general.

Recorded versions of the *Caprices* are extremely useful from a musical perspective. The utilization of this media helps temper the technical decision-making process. The overall

result is a more musical interpretation of the works than would be possible if technique alone dictated the transcription choices.

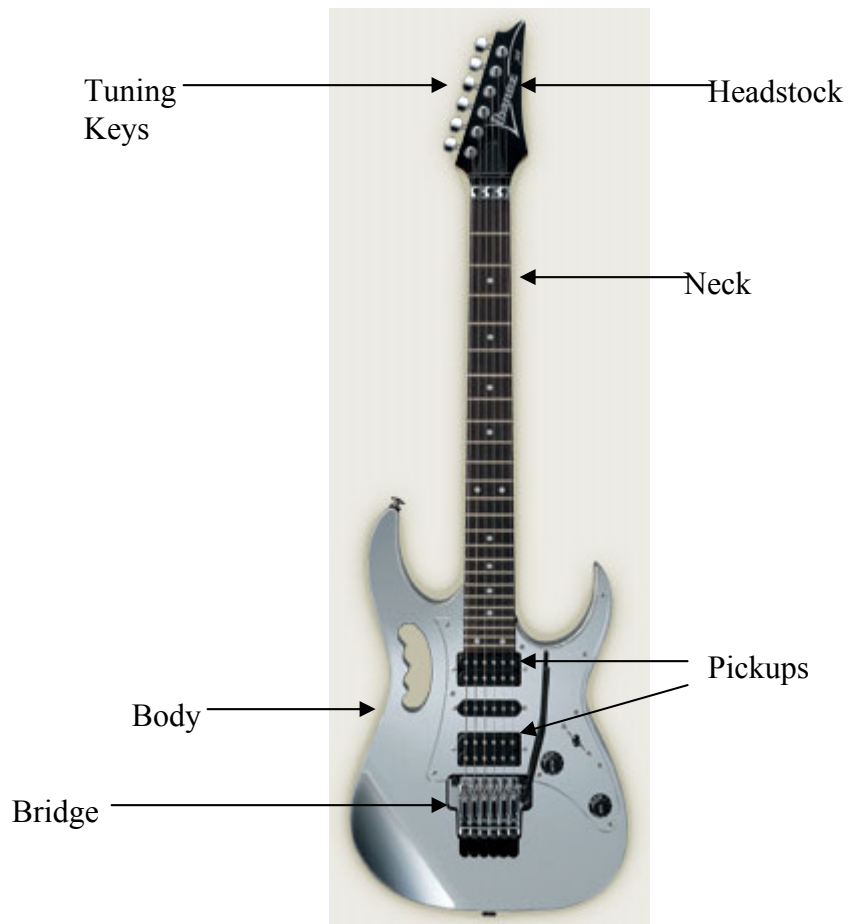
Recordings can also reveal the technical problem areas of individual performers or their performances. Analyzing these problem areas allows transcription decision-making to be amended so as to avoid these shortcomings.

# Chapter Two: Electric guitar set-up

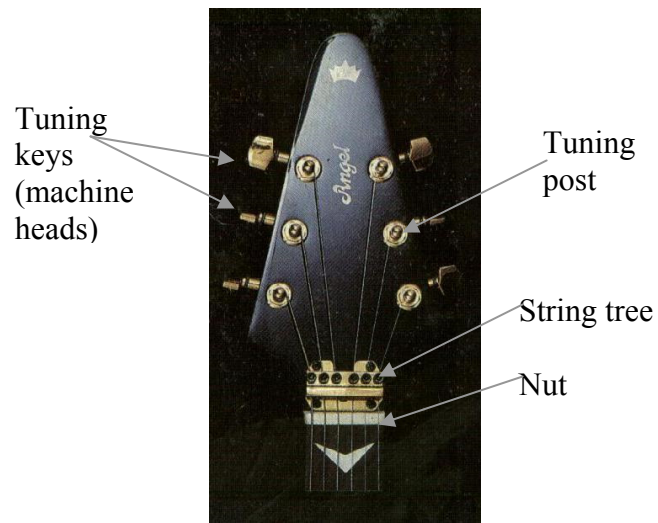
## 2.1 Introduction

Before specific adjustments can be discussed it is important to define aspects of guitar hardware and associated terminology.

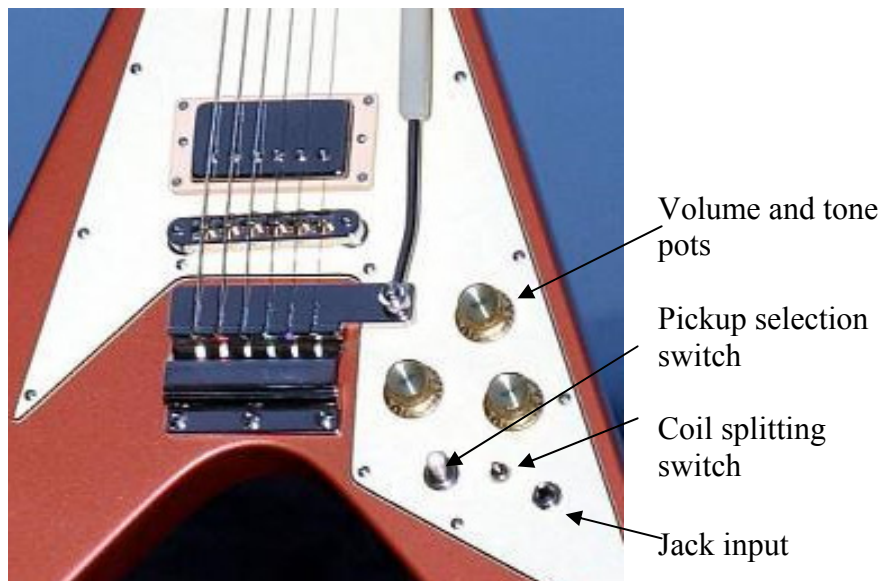
Ibanez Jem77BRMR



Royal angel headstock

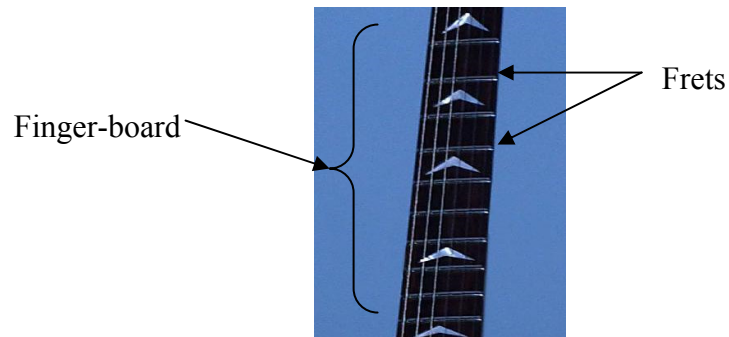


The Royal angel





Royal angel finger-board



One of the factors indirectly responsible for the degree of success when performing the *Caprices* on the electric guitar is the hardware set-up. Although subjective to both individual preference and musical genre, it is noteworthy that certain set-up commonalities exist amongst the guitarists with advanced technique. A good example of this is the commonly used combination of rigid plectrum and light gauge strings. This allows the strings to flex, facilitating a plectrum string striking motion that passes more easily over the strings.

The generalized trends that have evolved have done so to facilitate minimal effort when performing music that requires advanced technique.<sup>162</sup> Although each individual technique requires slightly different set-up parameters, many have a commonality that allows a less specific set-up to accommodate most conceivable technical scenarios.

## 2.2 Hardware

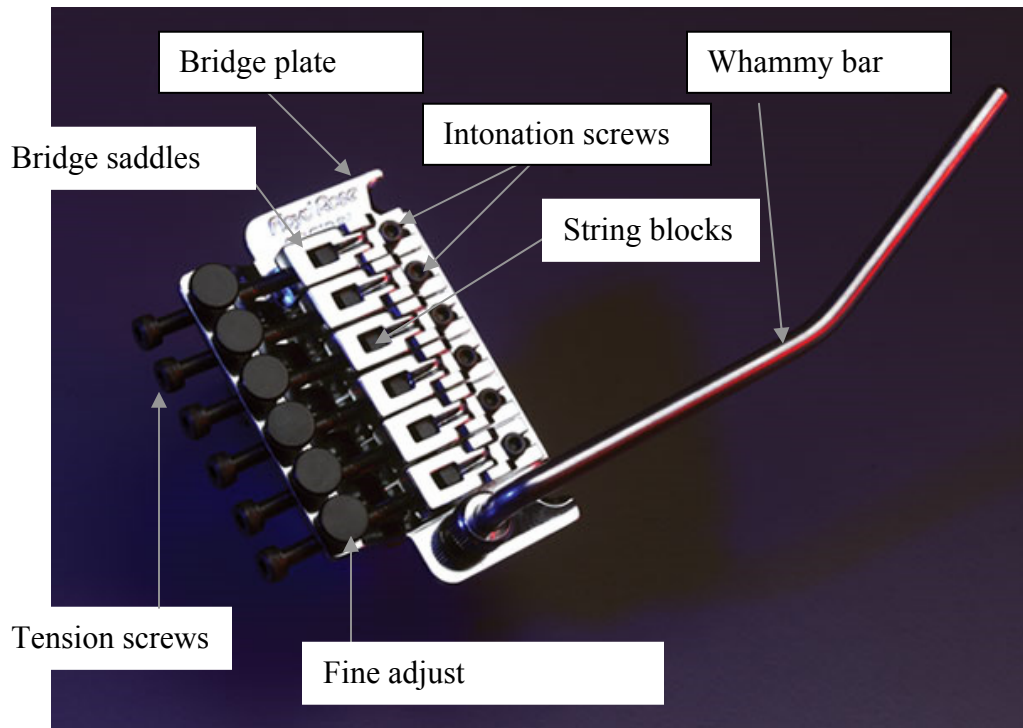
### 2.2.1 The relationship between action and floating bridge

The degree to which an electric guitar plays in tune is dictated by two factors: the length of the string and the position of the frets. Due to string intonation issues and its influence on tuning, most bridge plates have a certain degree of latitude for string saddle

<sup>162</sup> Paul Gilbert, *Get Out of My Yard*, USA, Alfred Publishing, 2007.

adjustment. Whether it is a two screw Fender saddle<sup>163</sup> or a single bolt Floyd Rose saddle, the majority of bridge set-ups utilize an Allen key adjustment.<sup>164</sup> The picture below illustrates the classic Floyd Rose bridge.

### Floyd Rose floating bridge



New strings and a tuner are required in order to set the intonation on the electric guitar. By tuning the string and playing the natural harmonic on the 12<sup>th</sup> fret it can be determined whether the string needs be either lengthened or shortened.<sup>165</sup> If the note on the 12<sup>th</sup> fret is precisely an octave higher than the open sting it is the correct length.<sup>166</sup> However, if the note is sharp, the string must be lengthened by adjusting the bridge saddle in the opposite direction of the headstock (the opposite would apply if the note was flat).<sup>167</sup> As the strings become older, they lose the ability to stay in tune and contribute to intonation

<sup>163</sup> Tom Kolb, *Playing in the Style of the Fender Stratocaster Greats*, Henderson, NV: Star Licks Productions, 2005.

<sup>164</sup> *Ibid*

<sup>165</sup> *Ibid*

<sup>166</sup> *Ibid*

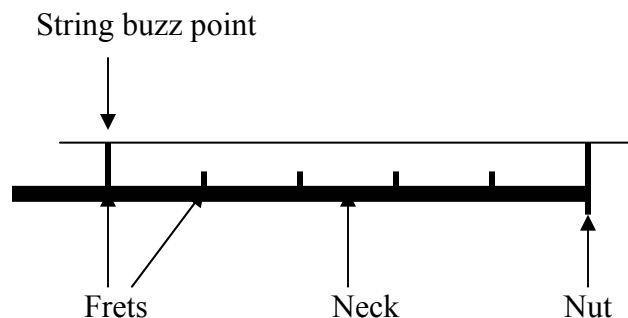
<sup>167</sup> *Ibid*

problems. Additionally, the E, B and G strings can often lose their ability to stay in tune quicker than the other strings, due to their lesser string tension.<sup>168</sup>

Low action<sup>169</sup> both maximizes technical efficiency whilst minimizing physical effort.

Where speed is paramount, reducing the distance between the string and the fret reduces not only the amount of effort required to fret a note, but also the response time between notes. Therefore, by either tightening or loosening the pivot posts the floating bridge can be adjusted to raise or lower the action, allowing the optimum position to be attained for the aforementioned factors.

In general, electric guitar fingerboards are convex in shape to prevent “string buzz” when fretting notes.



However, with the majority of bridge plates being flat, many brands of saddles are equipped with screws and/or Allen keys in order to be adjusted to accommodate the curvature of the neck.

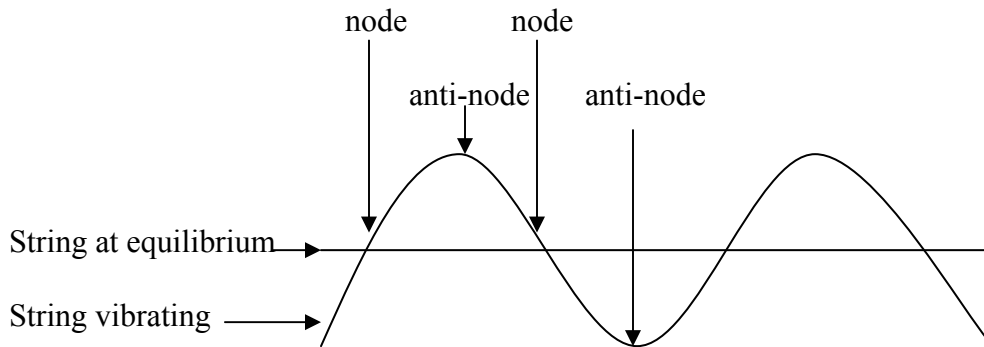
Setting saddle height and bridge adjustment is a simple method in which the elevation of the strings on the peripheral edges of the guitar neck (in most cases the first and sixth

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<sup>168</sup> D’Addario, ‘String Tension 101’, [http://www.tothestage.com/upload/StringTension\\_1949.pdf](http://www.tothestage.com/upload/StringTension_1949.pdf); accessed 17<sup>th</sup> Decemeber 2007.

<sup>169</sup> Action refers to the distance between string and fret.

string) are lowered to their optimum height with the bridge adjustment. The remaining individual saddles can then be adjusted relative to this position. The optimum height can be defined as the lowest position to which the string can be adjusted without creating extraneous fret noise or buzz. This is in essence where the nodes and anti-nodes of vibration are not altered by any fret other than the one being depressed.



Whether or not to have the electric guitar action set as low as possible can be influenced by a number of factors. For example, the technique of finger-tapping is most effective when the action is extremely low, whilst alternate-picking requires a higher action due to its increased string displacement. Therefore, if these techniques appear in conjunction with each other, an equilibrium point between the two actions must be used. Although it is impractical to have a dissimilar action set-up for each technical scenario, individuals often set the action dependent on their most used technique or playing style. This means the less frequently used techniques have to adapt to a guitar set-up that is not necessarily ideal, an example being players such as Tony MacAlpine, Vinnie Moore and Yngwie Malmsteen use guitars with lower action due to their technical needs. In contrast, blues slide players such as Muddy Waters, Johnny Winter and Duane Allman require guitars with higher action to facilitate the unimpaired use of the slide.

For all intents and purposes, the bridge can be divided into two different types; fixed and floating.<sup>170</sup> The most fundamental is the fixed bridge, which is often screwed or glued to the body of the guitar. Illustrated below are two of the more common fixed bridges used on the electric guitar.

#### Hipshot Fixed Guitar Bridge



#### Gotoh Tunematic



The advantage of a fixed bridge is that, if set up correctly, it can retain its tuning more easily than the floating bridge, due to the absence of the spring mounting counter balance system. However, it lacks the ability to alter the pitch via means of a whammy bar or tremolo bar.

Although the floating bridge is a more complex set-up, it provides a greater variety of pitch-bending options.<sup>171</sup> However, one of its main disadvantages is that it is more prone to going out of tune if not set up correctly.<sup>172</sup> This can, to a certain extent, be avoided through the use of a locking nut, which locks the strings in place when using the whammy bar.

It helps to maintain tuning by avoiding a common reason for floating bridge guitars dropping out of tune. When the whammy bar is used, the string naturally loosens on the

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<sup>170</sup> Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.

<sup>171</sup> *Ibid*

<sup>172</sup> *Ibid*

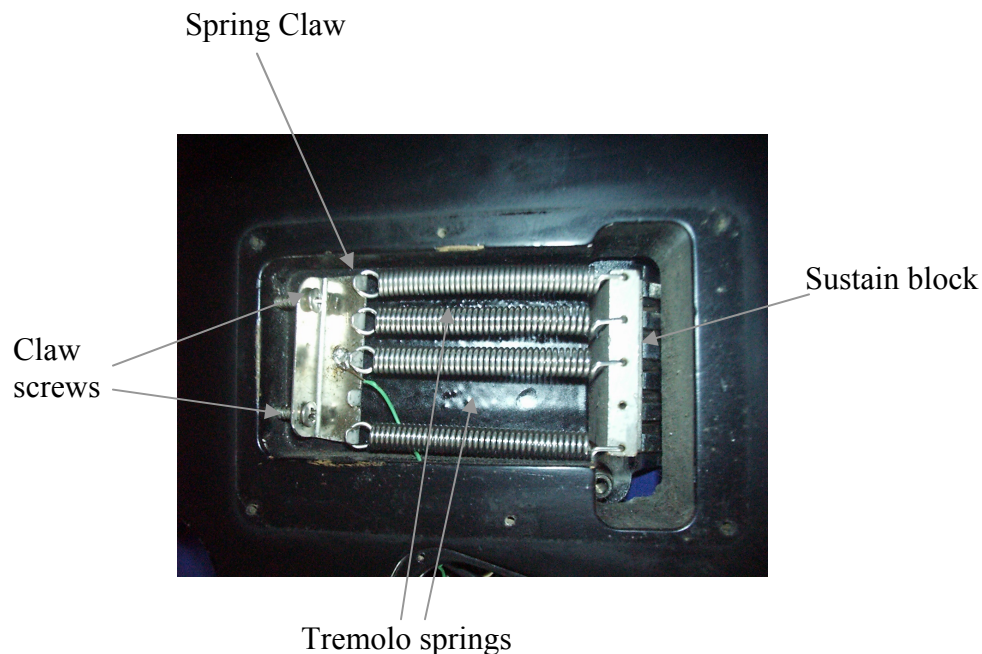
tuning post.<sup>173</sup> The strings failure to return to their original position on the post is often the reason why this type of set-up goes out of tune.<sup>174</sup> The locking nut holds the strings in place, retaining the same pressure on the tuning post at all times, irrespective of the extent to which the whammy bar is used.

Locking nut



The floating bridge uses a counter balance system in which springs on the back of the guitar off-set the tension of the strings.<sup>175</sup>

Floating bridge counter balance

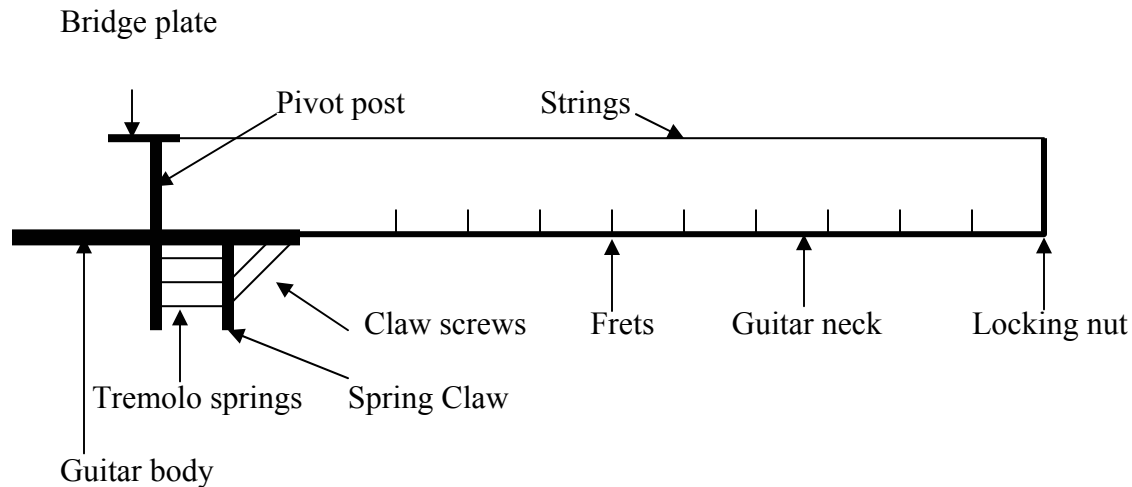


<sup>173</sup> Wolf Marshall, *Yngwie Malmsteen's Style*, Seattle: R.E.H. Publications Inc., 1986.

<sup>174</sup> *Ibid*

<sup>175</sup> Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.

The representation below illustrates the basic principles of the floating bridge and its tension off-sets.



The diagram shows that in order for the guitar to stay in tune when the whammy bar is used, spring pressure needs to be equal to string tension.<sup>176</sup> This fine balance is achieved through the adjustment of the claw screws.<sup>177</sup> Therefore, putting pressure on the whammy bar and releasing it indicates which way the screws need to be adjusted; notes going flat after whammy bar use indicate the need to increase screw tension, whilst sharp notes require the opposite.

The amount of tension that the strings exert on the tremolo springs is dependent on their gauge; the heavier the gauge the more tension is exerted. Therefore, changing string gauges when using a floating bridge often requires a tremolo spring readjustment. The age of strings can also affect the ability of the floating bridge to retain its tuning. Regular changes help avoid the usual loss of both string intonation and elasticity often associated with tuning issues.

<sup>176</sup> Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.

<sup>177</sup> *Ibid*

### 2.2.2 Electric guitar pickups

An integral part of the process of translating technique to aurally perceived sound is the guitar pickup. Having a basic understanding of pickup function and how string vibration is translated into sound and their setup can help exploit the different tones that can be generated by the electric guitar.

Choosing a substandard pickup, or one ill-equipped to handle the demands of a specific technique or genre of music, can result in inadequate sound quality. Familiarization with the tones that different pickups can create comes with experience. By analyzing pickup configurations, tone diagrams and how players in a chosen field sound, a familiarity with string tone in a practical playing scenario can be gained. Within the genre of neoclassical electric guitar performance, there are three major brands of pickups most commonly used, Dimarzio, Seymour Duncan and EMG.

Pickups have been produced in many shapes and sizes from the single coil fender Stratocaster style pickup to the multi-coil humbucker.

Single coil pickup



Humbucker pickup





The majority of pickups work in the same basic manner, utilizing a coil of wire around a magnet(s). These two components create a magnetic field through a stationary coil, which in turn induces an electronic signal sent to the preamp and power-amp to be transmuted into audible sound.

Many aspects of pickup construction can be manipulated in order to generate different string tone characteristics. For example, the magnet composition can vary from Alnico<sup>178</sup> to Ceramic<sup>179</sup> (these are the most commonly used elements), with windings on the bobbin,<sup>180</sup> as well as the amount of insulation all contributing to the pickups overall sound.<sup>181</sup>

The pickup's output is directly proportional to the number of copper windings around the bobbin. A pickup's output is measured in DC resistance, kilo ohms (k $\Omega$ ). A general guide to the relationship between k $\Omega$  and pickup sound is as follows: from 3 to 6k $\Omega$  a very clean sound is produced, 6 to 9k $\Omega$  produces a slightly "edgy" sound and 9 to 14k $\Omega$  produces a more distorted "dirty" sound. For guitarists who require heavily overdriven sound, pickups are manufactured such as the X2N by Dimarzio which exceeds 25 k $\Omega$  resistance.

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<sup>178</sup> Alnico is an alloy of aluminum, nickel, and cobalt used in Fender Guitars, Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.

<sup>179</sup> Ceramic gives a brighter tone and is cheaper to make whereas Alnico is more expensive but gives a warmer tone and is the preferred medium.

<sup>180</sup> The bobbin is the piece that the poles sit in and the copper wire is wrapped around.

<sup>181</sup> The insulation is usually paraffin wax and it helps to prevent microphonic feedback.

### X2N pickup



The obvious limitation of utilizing such powerful pickups is the inability to produce extremely clean sounds. To this end, some guitarists who use humbuckers choose to coil tap<sup>182</sup> their pickups, cutting  $k\Omega$  resistance in half to allow a cleaner tone when required.

A pickup's frequency response is tailored to enhance the specific tone characteristics of the string's vibration, which occur on different parts of the string. For example, the string vibrates more loudly and creates more bass frequencies in the neck position than in the bridge position. Consequently, the neck pickups are designed to cope more readily with those frequencies.

Adjusting the pickup to its optimum height under the strings can affect the pickup's tone quality and the frequency response.<sup>183</sup> The adjustment screws are spring-loaded, often being located on the outer edge of the pickup surround. If the distance between the strings and the pickup poles<sup>184</sup> is too great, the magnetic field will be of inadequate strength. This will limit the pickup's ability to discern certain string nuances. However, if the pickup is too close to a string, the magnetic pull that it creates can alter the string's natural vibration. Close pickup positioning can also create a problem with the string(s)

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<sup>182</sup> Coil tapping or splitting the coil refers to switching between humbucking and single coil on the same pickup.

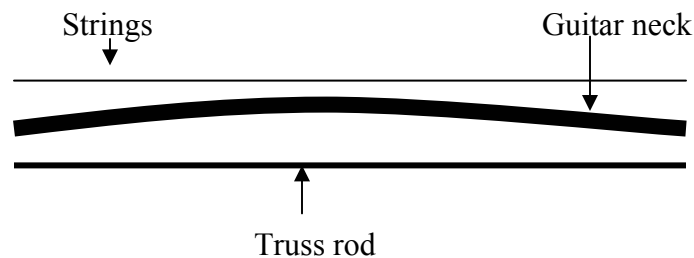
<sup>183</sup> Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.

<sup>184</sup> The part of the pickup directly located under the string and can be Allen key bolts (as in the case of the PAF Pro). In the case of the PAF Pro the pickup construction allows the guitarist to adjust the individual poles with minimal effort.

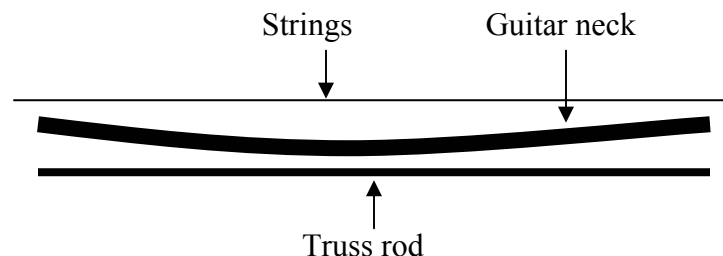
hitting the actual pickup poles. By altering the height whilst the guitar is plugged into the amplifier, one can aurally discern the “zone” in which the pickup is working at optimum efficiency.

### 2.2.3 Truss rod

A truss rod runs between the headstock and the guitar body end of the neck. The adjustments can be located at either end of the guitar neck and often require an Allen key for alteration. Most guitars off the production line require a certain degree of truss rod adjustment, depending on the intended musical genre. Traditionally, the truss rod is an engineering apparatus, tensioning only one way. On the electric guitar for the most part this is also true, with the truss rod relying on the string tension to pull with an opposing force. If the guitar neck is bowed towards the strings then the truss rod is too tight and can result in string buzz or in extreme cases the fingerboard separating from the neck. In these cases, loosening the truss rod can take advantage of the natural pull of the strings, which straightens the guitar neck.



Above is a graphic representation of how the truss bends when overly tight and requires loosening and below demonstrates when the truss rod needs tightening.



In the latter, note duration is affected by the increased distance between the neck and the strings; more prevalent in the middle of the neck where the distance is greatest.

#### **2.2.4 The nut**

The nut refers to the grooved piece of material at the top of the fingerboard. This can be divided into two different types; the locking nut, often used in conjunction with a floating bridge, and a normal nut. A normal non-locking nut can be constructed of many materials, most commonly plastic and bone. There are also nuts that compensate for tuning issues that arise with open chords such as the Earvana.<sup>185</sup>

In order to improve tuning stability a number of options can be used. These include widening the grooves in the nut and lubricating them,<sup>186</sup> which helps the strings slide through the nut more freely.<sup>187</sup> This can be done in conjunction with reducing the number of string windings on the tuning posts,<sup>188</sup> which maximizes the chance of the string returning to its original position.

Setting the nut at its correct height is also of extreme importance. Too low and string buzz becomes a problem and too high can create difficulty when depressing the strings on the lower frets. Raising its height requires the placement of a spacer below the nut. Lowering it however, requires either the underside of the nut to be filed, or the wood immediate below the nut to be chiseled out. The latter requires in-depth knowledge of the relationship between string pressure and headstock thickness, to avoid adversely affecting headstock strength.

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<sup>185</sup> Stephen Delft, 'The Compensated Nut', <http://www.mimf.com/nutcomp/>; accessed 18<sup>th</sup> February 2008.

<sup>186</sup> Marshall, *Yngwie Malmsteen's Style*, 1986.

<sup>187</sup> *Ibid*

<sup>188</sup> *Ibid*

### 2.2.5 General trends of plectrum width and string gauge

Which is the correct combination of plectrum thickness and string gauge? Although this question is subjective in nature, observations of electric guitar players within the neoclassical genre suggest a combination of light-gauge strings and thicker plectrum. A possible reason for this trend resides within the field of tone generation. When the plectrum strikes the string, overall control of tone, and the wave envelope, is easier when only one surface flexes, in this case the string. A rigid grip on the plectrum is needed to ensure that the angle of the plectrum remains constant relative to the string,<sup>189</sup> a trend that can be seen in the style of many guitarists. Moreover, this issue has pushed many players to experiment with different types of material and plectrum thickness from using small rigid jazz picks to metal picks constructed of copper. Some plectrum manufacturers such as Segovia have constructed a triangle pick in an attempt to combat the need to continually change picks for different performance situations.

### 2.2.6 Distortion

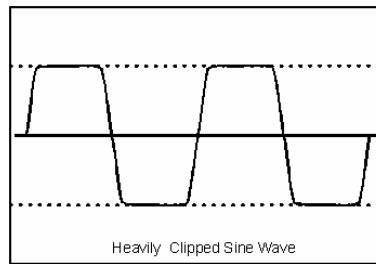
Where appropriate, the use of distortion can add note colourings that are otherwise harder to obtain using little or no overdrive. In this case, distortion<sup>190</sup> refers to the overdriving of the preamp signal, which results in the removal of the wave peaks.

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<sup>189</sup> Gilbert, *Get Out of my Yard*, 2007.

<sup>190</sup> Blackstone, 'Distortion 101', <http://www.mindspring.com/~j.blackstone/dist101.htm>; accessed on June 19<sup>th</sup> 2007.

### Clipped peak distortion wave



With distortion functioning as a natural method of compression, its use has many practical applications. These can vary from smoothening out long *legato* passages, to sustaining single notes for extended periods.

#### 2.2.7 Amplification and distortion

Just as the pickups are an integral part in relaying the nuances of string tone, the importance of the amplification lies in its transmutation of that electronic signal into aurally perceivable sound. The umbrella term of amplification can be reduced into two signal processing stages; the preamp and power-amp stages. The general trend to gain a desirable “smooth” sounding distortion, has been to use valves in both the preamp and power-amp stages. However, as technology has evolved, hybrid<sup>191</sup> amps, such as the Marshall mode 4, have in recent years also become popular, using a combination of valves and solid-state circuitry.

Both the preamp and the power-amp can be obtained separately in rack form or in an all-in-one unit. The illustrations below show both a Marshall preamp and power-amp in separate units and a Peavey 6505 with the preamp and power-amp in the same module.<sup>192</sup>

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<sup>191</sup> The word hybrid in relation to amplifiers refers to a combination of valve and solid state technology. Marshall, [http://www.marshallamps.com/product\\_range.asp?productRangeId=1](http://www.marshallamps.com/product_range.asp?productRangeId=1); accessed on June 19<sup>th</sup> 2007.

<sup>192</sup> Heads refers to the amplification unit that sits on top of the speaker box. As opposed to the “combo” which is power-amp, preamp, and speaker(s) in one unit.

Marshall JMP1 preamp



Marshall 100/100 mono block power amp



Peavey 6505 plus head



The advantage of having separate preamps and power-amp units is the ability to combine different units with specific tone characteristics, regardless of brand. This flexibility allows the guitarist to more easily customize his/her sound than having both preamp and power-amp in the same unit. This trend helped shape guitar sound in the 1980s and early 1990s, when rack-mounted units reached the apex of their popularity. From the mid-1990s the popularity of rack mounted units waned in favor of the new technologically advanced all-in-one units, many of which feature advanced digital effects and amp modeling with integrated amplifier emulation (to interface with a DAW<sup>193</sup> for recording), allowing the guitarist multiple combinations through an integrated internet interface. These amps allow the user to faithfully recreate the tone of anything from the classic Vox AC30 and Marshall JCM 800 master volume, to a Peavey 5150, by simply turning a dial. The obvious versatility of these units has made them both popular and practical in

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<sup>193</sup> DAW is the abbreviation for digital audio workstation.

multiple playing situations from the studio to live performance. One of the leaders in the field is Line 6; the picture below shows one of the new line 6 spider combos.

Line 6 spider



### **2.2.8 Inadequate equipment**

In order to satisfactorily achieve technical progress, many hours must be invested in regular practice with the correct attitude.<sup>194</sup> The negative psychological effects on technical progress created by inadequate equipment can be significant. For example, the development of technique and its aural tonal realization inspires most guitarists to pursue improvement through rigorous hours of practice. However, if the equipment is incapable of producing the necessary sound quality, a guitarist will not only waste valuable time attempting to achieve the impossible but will also become frustrated with the results.

## **2.3 Chapter Summary**

The choice of appropriate equipment and its set-up has a direct bearing on the degree of technical improvement that can be achieved. Inadequate equipment or inappropriate hardware setup can result in little or no technical progress.

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<sup>194</sup> Steve Bailey, *Fretless Bass*, Miami: CPP Media Group, 1994.



The guitar set-up is influenced by many factors such as musical genre, technique and individual physical limitations i.e. finger size and stretch. In order to optimize technical improvement, a working knowledge of the electric guitar's hardware and how to make customizable adjustments, is essential.

# Chapter Three: Factors common to most styles of guitar playing

## 3.1 Introduction

In order to fully realize the scope of potential technical development, it is necessary to discuss broader aspects prior to narrowing the focus to the *Caprices*. These technical fundamentals are required by guitarists irrespective of musical genre. They cover everything from dampening and correct note fretting, to pickup selection and finger-board mobility.

## 3.2 Fundamentals

### 3.2.1 Left hand economy of motion

When using either the fingers or plectrum to generate string vibration, the fingers on the left hand should move a minimal distance from the strings.<sup>195</sup> Economizing the motion in this fashion helps to facilitate speed whilst minimizing effort.<sup>196</sup> The correct distance can be defined as just enough to not hinder the natural string vibration,<sup>197</sup> with hammer-ons and pull-offs being an exception to this rule. This distance can vary slightly, dependent on the strings vibrational displacement and its maximum amplitude.<sup>198</sup>

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<sup>195</sup> Juan Martin, *El Arte Flamenco De La Guitarra*. London: United Music Publishers Ltd, 1978. p. 23.

<sup>196</sup> *Ibid*

<sup>197</sup> *Ibid*

<sup>198</sup> Quine, Hector. *Guitar Technique*. New York: Oxford University Press, 1990, p. 50.

### 3.2.2 Finger positioning and action

Within both the major and the natural minor keys, it can be useful to adopt the one-finger-per-fret convention.<sup>199</sup> This allows many musical scenarios to be covered with a broad finger placement philosophy. The finger position that is generally used is fingertips vertical<sup>200</sup> with fingers 90 degrees to the finger-board.<sup>201</sup> This requires minimal pressure from the wrist.<sup>202</sup>

However, when utilizing three-note-per-string scales or modal tonality, consecutive whole-tones arise. This means that at least one finger is required to span two frets, creating a finger combination of either ‘one two and four’<sup>203</sup> or, less commonly, ‘one three and four’.<sup>204</sup> These fingerings provide a solid foundation for playing diatonic harmony and unaltered scales. Additionally, the incorporation and development of larger stretches, position shifts and/or slides can also utilize the one-finger-per-fret idea as a fundamental starting point.<sup>205</sup>

The diagram illustrates a C major/A minor pattern throughout 12 frets of the finger-board. Whenever three-note-per-string diatonic scales are employed, there are never more than two whole-tones (two fret spacing) between notes. The impact this has on the arrangement of fingerings for tonal music can be far reaching for the chord and scalar melody of the *Caprices*.

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<sup>199</sup> Martin, *El Arte Flamenco De La Guitarra*, p. 23.

<sup>200</sup> Martin, *El Arte Flamenco De La Guitarra*, p. 22. ; Quine, *Guitar Technique*. p. 44.

<sup>201</sup> Quine, *Guitar Technique*. p. 45.

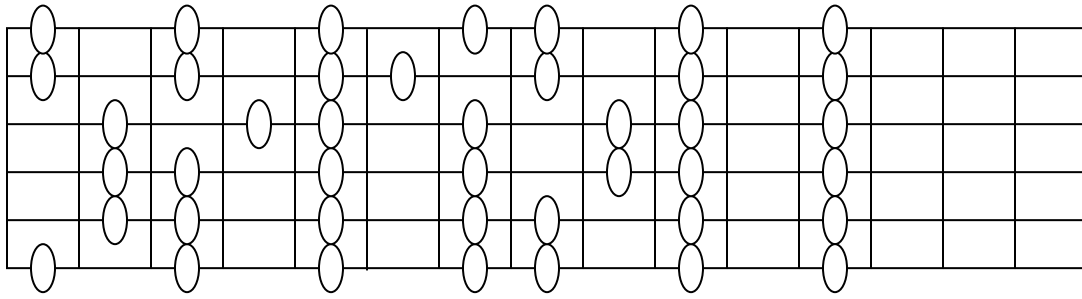
<sup>202</sup> Martin, *El Arte Flamenco De La Guitarra*, p. 22.

<sup>203</sup> Observed in Yngwie J Malmsteen, *Play Loud! The First Movement, The Basics*, Japan: YG Factory Inc., 1995.

<sup>204</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>205</sup> Observed in John Petrucci, *Rock Discipline*, Miami: Warner Bros. Publications Inc., 1995.

### Diatonic C major/A Minor pattern



Practical applications of these fingering principles, within the context of the *Caprices*, are discussed in depth within the technique specific chapters.

Irrespective of finger choice the fingers should retain a relaxed curvature with the removal and repositioning done through a single movement of the knuckle joint (first phalanx).<sup>206</sup> A consistent curvature ensures that the string is always struck with the same angle and part of the finger promoting both efficiency and consistency.<sup>207</sup>

### 3.2.3 Plectrum technique

When striking the string with the plectrum, the continuity of tone between notes is best created through consistent pressure, grip and angle of the plectrum. Related to this is the fundamental concern of how to grip the plectrum, commonly done between the thumb and the first finger.<sup>208</sup>

The ability to control the general tone of the string is dependent on a combination of four factors, note fretting, palm dampening,<sup>209</sup> finger muting,<sup>210</sup> and plectrum angle. These factors can be divided into two subgroups, note fretting and correct plectrum angle being

<sup>206</sup> Quine, *Guitar Technique*, p. 49.

<sup>207</sup> *Ibid*

<sup>208</sup> Obrecht, 'Rising Force', pp. 58-74.

<sup>209</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>210</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

the primary group. The secondary group can be defined as primary group modifiers, including aspects such as finger muting and palm dampening. In order to produce clean controlled notes with correct contextual tone colourings, all four factors must be evident to some degree.

### **3.2.4 Plectrum angle**

String tone consistency is best achieved when the plectrum angle relative to the string remains constant. This becomes more difficult when moving between adjacent strings or string-skipping.<sup>211</sup> In these cases, a repositioning of the hand and a changing of the elbow angle can be required. Often, the natural inclination is to twist the wrist, effectively reaching for the notes. However, a more desirable result is often achieved by moving the elbow to deliver the hand to the target area in a controlled motion. This allows the wrist and palm to accurately duplicate its previous orientation in the new position relative to the string, prompting plectrum angle consistency.

### **3.2.5 String fretting**

There are a number of problems that can arise when the incorrect fretting of the string occurs. Placing a finger too close to a fret can result in “string buzz”.<sup>212</sup> If either jumbo frets<sup>213</sup> or a scalloped finger-board<sup>214</sup> are utilized, minimum left-hand pressure is most desirable. This helps avoid single notes or chord voicings going out of tune.

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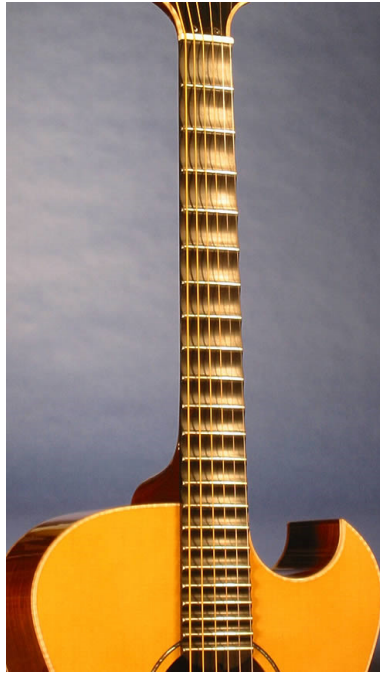
<sup>211</sup> Observed in Gilbert, *Intense Rock*, 1988.

<sup>212</sup> Martin, *El Arte Flamenco De La Guitarra*, p. 22.

<sup>213</sup> Jumbo frets refer to frets larger and sometimes higher than the standard fret.

<sup>214</sup> A finger-board that has the wood carved out between the frets.

Wechter Elite nylon string acoustic guitar  
with a scalloped finger-board



When one note is sustained whilst other fingers are changing position it is imperative not to alter either pressure or position of the original note. One of the advantages of having a finger-board under the fingers, in contrast to a scalloped finger-board, is that it limits the amount of pressure that the guitarist can put on the strings.<sup>215</sup>

The exact pressure needed to fret a note is impossible to specify due to the number of variables. However, the correct pressure can be defined as the minimum required to create a note cleanly.<sup>216</sup>

### **3.2.6 Finger-tapping fingering position**

One of the commonalities between the finger-tapping fingers and the plectrum is the role that the elbow plays in delivering both to the same position relative to the string.

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<sup>215</sup> Malmsteen, *Masters Series*, 1991.

<sup>216</sup> Quine, *Guitar Technique*. p. 44

Although the distance that the elbow travels is different in both cases, a familiarity with both motions is required.

### **3.2.7 Finger-Barré**

The term Finger-Barré refers to a method used by guitarists to play multiple notes that occupy the same fret on different strings. In order to do this most efficiently, one finger is used to fret multiple strings.<sup>217</sup> Utilizing finger-barrés can be an advantage in both single-note melody and chordal harmony.<sup>218</sup> Within the constructs of single-note melody, fretting two strings consecutively using the same finger with separate movements can jeopardize the tone and slow the tempo. Finger-barrés eliminate the need for this kind of motion by fretting both notes with one finger and one motion, minimizing left hand movement.<sup>219</sup> Within the framework of chordal harmony, finger-barrés allow six-note chords and contrapuntal harmony to exist within the same finger shape. For this reason, all fingers should be capable of executing finger-barrés.

### **3.2.8 Finger-board hand**

Accurately positioning the left hand on the finger-board is one of the most fundamental abilities required to play the guitar. Its accurate positioning is defined by the thumb at the back of the electric guitar neck, opposite the fingers.<sup>220</sup> When utilizing either slides or large leaps, the thumb is required to be relocated between positions. Incorrectly positioning the thumb can render some of the required notes inaccessible, whilst correct positioning results in relaxed fingering with maximum note accessibility. Most guitar necks are built with a subtle width change across the length, making note location

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<sup>217</sup> Bruce Bouillet, *Improvisation for Progressive Hard Rock Guitar*, California: Back Stage Pass Production, 1989.

<sup>218</sup> *Ibid*

<sup>219</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>220</sup> Martian, *El Arte Flamenco De La Guitarra*, p. 22.

through feel much harder. Therefore, position shifts can be performed using two different methods. Firstly, the guitarist can visually reference the neck when a position shift takes place, the disadvantage of which is the change in visual focus from the written music to the guitar neck and back. The second method is relative positioning, which is the calculation of the new position in relation to the previous one.

There is a direct correlation between the speed with which continuous melody lines in different positions can be played and the quickness of position shifting. A common failing amongst guitarists is their inability to shift position fluently, with note duration immediately before, during and after the shift remaining constant. Therefore, if a continuous tempo is desirable, the speed at which the melody can be performed is reliant on the guitarist's ability to shift position fluently.

### **3.2.9 Note and plectrum synchronization**

Synchronization refers to a combined action of depressing left-hand notes and right-hand picking.<sup>221</sup> Although one of the simplest concepts to comprehend, at fast tempi many guitarists struggle with its practical application. Incorrect synchronization can result in a lack of clarity in note definition,<sup>222</sup> affecting the autonomy of the individual note.<sup>223</sup> This detrimental effect blurs both the initial attack and end point, making note differentiation more difficult.

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<sup>221</sup> Gilbert, *Intense Rock*, 1988.

<sup>222</sup> *Ibid*

<sup>223</sup> Gilbert, *Get Out of my Yard*, 2007.



### 3.2.10 Speed

The development of speed is achieved through consistent disciplined practice. In order to develop the speed, accuracy and consistency required for the *Caprices*, technique must remain consistent at all tempi.<sup>224</sup>

### 3.2.11 Sequencing notes and sequences

Due to the difference between the compositional meaning of ‘sequence’ and the guitarist definition of ‘note sequencing’ some clarification is necessary. A sequence in compositional terms can be described as successive transposition and repetition of a phrase at different pitches.<sup>225</sup> ‘Sequencing notes’ can best be described as a figuration of notes within a framework (often diatonic) that may or may not move sequentially.

## 3.3 Note Expression

### 3.3.1 Dampening and finger-board muting

In order to fully appreciate the differences between finger-board muting and palm dampening, and their connection to string tone, a clear definition and understanding of the two techniques is required. Muting is the prevention of unwanted string noise, often referring to the underside of the fingers.<sup>226</sup> The term dampening is used most often in relation to the palm being lowered onto the string, which modifies the note envelop whilst preventing sympathetic string vibration.

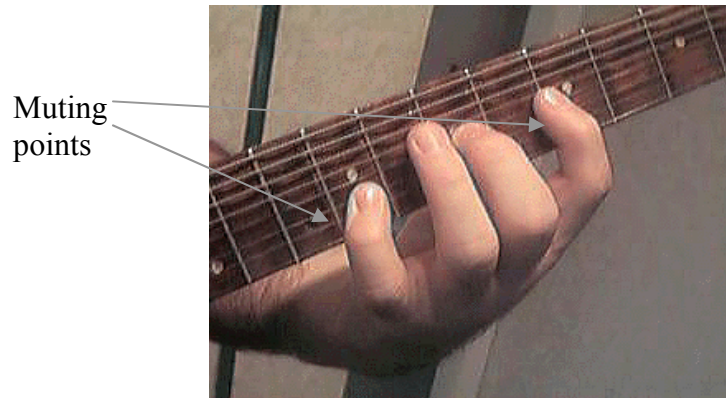
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<sup>224</sup> Petrucci, *Rock Discipline*, 1995. ; Angelo, Michael. *Speed Kills*, California: Metal Method Productions Inc., 1991.

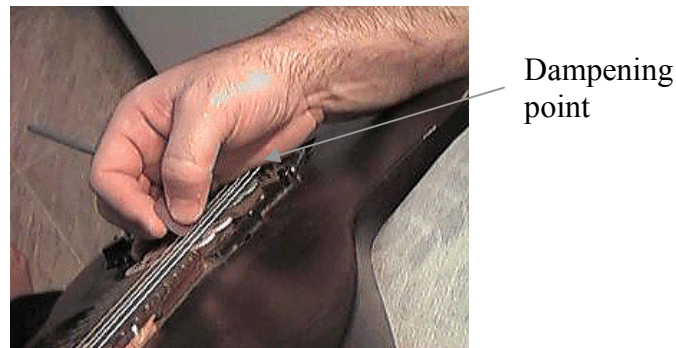
<sup>225</sup> Wikipedia, ‘Sequence’, [http://en.wikipedia.org/wiki/Sequence\\_\(music\)](http://en.wikipedia.org/wiki/Sequence_(music)); accessed 6<sup>th</sup> September, 2007.

<sup>226</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

The illustration shows finger-board muting and its application. As can be seen, the undersides of the fingers prevent the strings above the played notes from sounding.<sup>227</sup> This is necessary in order to prevent extraneous string vibration by accidentally hitting the strings with the plectrum, or knocking them with slightly misaligned fingerings.



Palm dampening is illustrated below by placing the edge of the hand on the strings.<sup>228</sup>



As the lower strings can be more prone to sympathetic vibration, using the palm in this fashion also helps to control any unwanted string noise. The amount of dampening used is directly proportional to the pressure the palm places on the string; heavy pressure produces a very short “chunky” *staccato* sound, where as very little pressure allows a longer sustained string vibration.

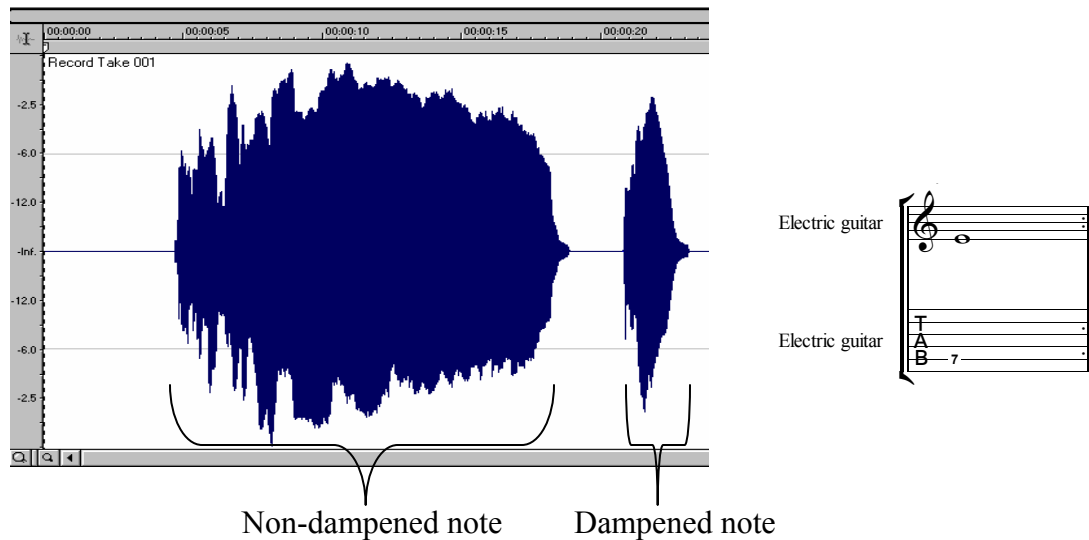
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<sup>227</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>228</sup> Steve Morse, ‘My Personal Picking Exercise’. *Guitar Player*, Vol. 19, No. 9, September 1995, p. 124.

Illustrated below is one example of the degree to which it is possible to modify the strings natural vibration. Factors such as the time the wave takes to peak and decay, dynamic level, attack and note duration, can all be controlled or altered.

Non-dampened and dampened wave form



Especially at fast tempi, both alternate-picking and sweep-picking can benefit from the clearly defined individual notes that dampening creates.<sup>229</sup> Contrasting long sustained *legato* note passages require very little dampening.<sup>230</sup>

One of the problematic issues surrounding palm dampening for note modification is the tuning issues that excess pressure on the strings can create. This is especially true when using a floating bridge set-up, where the entire bridge can be depressed if excess pressure occurs.

By using a combination of finger-board muting and palm dampening, it is possible to specifically tailor string tone colourings to more accurately represent or customise

<sup>229</sup> Observed in Gilbert, *Intense Rock 2*, 1991. ; Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>230</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

musical content.<sup>231</sup> This is especially pertinent when using distortion, where unwanted string noise becomes more audible, due to its compression characteristics.

### 3.3.2 Accents

The ability to colour the accented notes is of major concern to many guitar players, with some players such as Steve Vai making note colourations such as whammy bar phrasing, pinch harmonics,<sup>232</sup> and feed back,<sup>233</sup> a major trademark of their guitar performances.<sup>234</sup>

For accents to be performed effectively, control over the amount of head room<sup>235</sup> available is essential. Accents occupy the higher dynamic range, requiring a larger physical effort to generate than surrounding notes. Therefore, in order for a dynamic accent to be clearly discerned, the guitarist is required to play all the other material at a considerably lower volume. In this way, more dynamic options are available in regards to when and where to emphasize a note or grouping of notes.<sup>236</sup>

In order to generate accents the guitarist must control his/her ability to alter the depth that the pick descends into the strings<sup>237</sup> and this in turn controls the amount of pick area that strikes the string.<sup>238</sup> Therefore, the depth that the plectrum is lowered into the strings is directly proportional to the volume of the accent(s) produced.

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<sup>231</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>232</sup> Heard in 'The Attitude Song', Vai, *Flex-able*, 1984.

<sup>233</sup> Observed in Steve Vai, 'Blue Powder', <http://www.youtube.com/watch?v=LxLpSKaiQHM>; accessed on 28<sup>th</sup> March 2007.

<sup>234</sup> Obrecht, 'Steve Vai', pp. 74-154.

<sup>235</sup> Head room refers to the amount of loudness above the current volume. Similar to RMS and peak volume when referring to speaker power

<sup>236</sup> Simon Phillips, *Drum Workshop*, Miami: D.I.C. Publication, 1992.

<sup>237</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>238</sup> *Ibid*

Varying the pressure by which the plectrum is held, can alter both the amplitude of the accent and the overall volume of the note. Some techniques, such as sweep-picking, require less pressure in order for them to be performed smoothly.<sup>239</sup> However, in contrast excess pressure can create a more forced result with the plectrum “snagging” itself on the strings.

Another factor that can alter accent generation and dynamics is the position on the string where the note is picked. For example, notes picked towards the headstock, where string displacement increases, create a more “rounded” tone. The increased displacement of the string at these points can make controlling string dynamic, constancy of tone and dampening more problematic, a factor that becomes exacerbated at fast tempi. Plectrum activity closer to the bridge reduces the added variable of excess string displacement, making overall tone and dynamic more controllable.

When considering accents, another relevant variable is the use of distortion. As has been discussed, distortion works as a natural compression, squashing the peaks and raising the lower notes. This affects the accent in terms of available dynamic range, with excessive amounts of distortion reducing the effectiveness of dynamic accents. Pinch harmonics at these points can overcome this problem to a degree, as can one of the more mainstream techniques guitarists use, adjusting the volume knob.<sup>240</sup>

### **3.3.3 The volume control**

Due to the way the electric guitar pickup is often wired, reducing the volume control diminishes the power of the pickup in addition to its volume. With the reduction of

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<sup>239</sup> Observed in Malmsteen, *Masters Series*, 1991.

<sup>240</sup> Observed in Steve Morse, *The Essential Steve Morse*, New York: D.I.C. Publication, 1991.

power comes a reduction in the amount of distortion, creating a less compressed and more dynamically responsive sound.<sup>241</sup> Many guitarists continually alter the volume controller throughout a performance,<sup>242</sup> with the degree of alteration often dependent on the performer's perception of the desired dynamic.

### **3.3.4 Note colouring**

The term “note colouration” refers to the expressive qualities that a performer is able to impose on a note. This can occur at either the moment of note generation, or during its duration.<sup>243</sup> Many electric guitar players utilize different alteration techniques during the notes' durations giving them a distinctive sound.

### **3.3.5 Vibrato**

Vibrato is arguably the most universal, versatile and expressive colouration technique at the electric guitarist's disposal.<sup>244</sup> Therefore, unsurprisingly there are different methods of executing this form of expression, the simplest of which is the finger vibrato, which is the finger (and hand in most cases) moving back and forward on the note in the same position on the finger-board.<sup>245</sup> Vibrato speed is altered by changing the speed that the finger and/or hand move,<sup>246</sup> similar in principle to that used by violin players. The second method has evolved due to the use of frets.

Frets remove the intonation issues that concern string players of unfretted instruments such as the violin. By playing a note and pulling or pushing the string across the fret in a

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<sup>241</sup> Gilbert, *Terrifying Guitar Trip*, 1995.

<sup>242</sup> *Ibid*

<sup>243</sup> Allen Kozinn, 'John Williams'. *Guitar Player*, Vol. 14, No. 11, November 1980, pp. 58-84.

<sup>244</sup> Paul Gilbert, *Guitars from Mars 2*, Japan: YG Factory Inc., 1996.

<sup>245</sup> *Ibid*

<sup>246</sup> Observed in Stump, *Arpeggio Lesson Volume 1*, 2003.

rocking motion, the note changes pitch by changing string tension.<sup>247</sup> The extreme pitch bends that this style of vibrato promotes can be particularly expressive in nature. When used in combination with the aforementioned more conventional style of vibrato, it can effectively create discernable differences in consecutive phrases similar in nature. This scenario often arises in blues pentatonic phrasing.

The more extreme vibrato gained popularity with Jimi Hendrix, in combination with his extreme minor-third string bends. The trend of detuning the electric guitar in the 1980s also promoted this style of vibrato, facilitated by the corresponding decrease in string tension. Guitarists such as Steve Vai, Paul Gilbert and Yngwie Malmsteen enhanced their virtuosic approach to electric guitar phrasing by making extensive use of it.

Another method of vibrato that has been adopted by some players is called a vertical vibrato.<sup>248</sup> However, this is more akin to a very fast slide backwards and forwards between two notes,<sup>249</sup> making its classification as vibrato arguable.

### **3.3.6 Whammy bar**

Another trend popularized in the 1980s was that of the floating bridge,<sup>250</sup> which in turn further promoted whammy bar vibrato. This technique requires the played note to utilize the whammy bar consecutively or concurrently to affect pitch and vibrato speed changes.<sup>251</sup>

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<sup>247</sup> Observed in Gilbert, *Guitars from Mars* 2, 1996.

<sup>248</sup> George Lynch, *George Lynch*, Seattle: R.E.H. Publications Inc., 1990.

<sup>249</sup> *Ibid*

<sup>250</sup> The Floyd Rose bridge being the most well known, popularized by Eddie Van Halen. Stix, 'Life At The Top', pp. 10-100.

<sup>251</sup> Observed in Stevie Vai, 'For the Love of God', <http://www.youtube.com/watch?v=5NfZBvRvkIg>; 29<sup>th</sup> March, 2007.

The whammy bar can also be used to colour notes beyond simple vibrato. For example, it can be used effectively to alter a notes attack.<sup>252</sup> By holding the bar with the fourth finger<sup>253</sup> it is possible to alter the pitch simultaneously of almost any note played.<sup>254</sup> In this fashion, entire passages, chords, as well as individual notes within scalar patterns can be targeted for pitch alteration and/or vibrato.<sup>255</sup> The stylistic signatures of both Vinnie Moore and Steve Vai make extensive use of this technique for phrasing and motif colouration.

### 3.3.7 Volume control

As has been discussed in a previous paragraph, the volume knob can play a pivotal role in tone alterations; however, it can also be used to eliminate note attack. By picking any given note with the initial volume at zero, the fourth finger on the right hand can then turn the volume up and back down.<sup>256</sup> This effectively eliminates the notes spectrum attack and decay<sup>257</sup> producing a “violinistic” quality to the notes,<sup>258</sup> which is especially effective when using effects such as reverb and delay.<sup>259</sup>

### 3.3.8 Harmonics

Many guitar players such as Zakk Wylde<sup>260</sup> utilize pinch harmonics to aid in accents or to emphasize certain strong harmonic notes.<sup>261</sup> Pinch harmonics on the electric guitar can be generated when the pick and part of the thumb strike the string at the same time, at the

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<sup>252</sup> Lynch, *George Lynch*, 1990.

<sup>253</sup> Observed in Vinnie Moore, *Advanced Lead Guitar Techniques*, New York, Hot Licks Productions Inc, 1987.

<sup>254</sup> Observed in George Lynch, *George Lynch*, Seattle: R.E.H. Publications Inc, 1990.

<sup>255</sup> Vinnie Moore, *Advanced Lead Guitar Techniques*, New York, Hot Licks Productions Inc., 1987.

<sup>256</sup> Observed in Steve Morse, *The Complete Styles of Steve Morse*, New York: D.I.C. Publication, 1991.

<sup>257</sup> Jimmy Brown, ‘Dixie Flyer’. *Guitar World*, Vol. 13, No. 5, May 1992, pp. 37-46.

<sup>258</sup> Heard in ‘Cathedral’, Van Halen, *Diver Down*, Warner Bros. Records, BSK 3677, 1982.

<sup>259</sup> Heard in the beginning of ‘Black Star’ Yngwie J Malmsteen, *Rising Force*, Polydor, 825 324-2, 1984.

<sup>260</sup> Observed in Zakk Wylde, *Pentatonic Hardcore*, Japan: YG Factory Inc., 1997.

<sup>261</sup> Observed in Lynch, *George Lynch*, 1990.



point when note is picked.<sup>262</sup> Altering the position along the string where the note is generated changes the harmonic produced. Notes created in this fashion can be extremely effective for accents, strong beats and emphasizing certain notes in a harmonic hierarchy. Additionally, it is possible to add pinch harmonics to notes in differing amounts, which range from completely obscuring the fretted note<sup>263</sup> to adding subtle harmonic flavouring.<sup>264</sup>

Due to the harmonic fundamentals available on the guitar, it is possible to tap different harmonic intervals whilst holding down single notes or chords<sup>265</sup> with the left hand.<sup>266</sup> This is often done in conjunction with string bends; firstly, by sounding the note, followed by a tapped harmonic interval with the right hand, and finally a left-hand string bend.<sup>267</sup>

Another method of producing harmonics, popularised in the 1980s, is described as a rolling harmonic.<sup>268</sup> The technique uses either the right-hand palm<sup>269</sup> or the fingers,<sup>270</sup> which are pressed against the string/s. Simultaneously the left hand either trills or pulls off the strings that are being covered by the right hand. Moreover, the right hand can move position,<sup>271</sup> thereby changing the sounding harmonics.<sup>272</sup>

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<sup>262</sup> Mike Stern, *Guitar Instructional Video*, New York: Rittor Music Inc., 2000.

<sup>263</sup> Observed in Wylde, *Pentatonic Hardcore*, 1997.

<sup>264</sup> Observed in Gilbert, *Guitars from Mars 2*, 1996. ; Heard in 'Wicked', Symphony X, *The Odyssey*, InsideOut Music, 693723 653426, 2002.

<sup>265</sup> Observed in 'Guitar Solo', Van Halen. *Live without a net*, Warner-Pioneer, 45P6-9022, 1986.

<sup>266</sup> Arlen Roth, 'Harmonic Bends, Steel Effects, and Slide'. *Guitar Player*, Vol. 19, No. 5, May 1985, pp. 50-54.

<sup>267</sup> Heard in 'That Hormone Thing', Racer X. *Superheroes*, Shrapnel Records, Inc., SH 1153 2, 2001. ; Roth, 'Harmonic Bends, Steel Effects, and Slide', pp. 50-54.

<sup>268</sup> Lynch, *George Lynch*, 1990.

<sup>269</sup> Observed in Gilbert, *Intense Rock 2*, 1991.

<sup>270</sup> Lynch, *George Lynch*, 1990.

<sup>271</sup> Heard in 'The Stranger' and 'The Witch and the Priest', MacAlpine, *Edge of Insanity*, 1985.

<sup>272</sup> Lynch, *George Lynch*, 1990.

### 3.3.9 String bends

String bends are a popular method to alter string pitch and can be used in conjunction with note-colouring techniques. Simple to execute, the string bend alters the tension of the string by either pulling it towards the bottom of the neck or pushing it towards the top of the neck.<sup>273</sup> The note most commonly bent to is the next note in the scale, usually a minor or major second. It is also possible on the electric guitar to bend a number of strings at once,<sup>274</sup> either sounded consecutively<sup>275</sup> or concurrently.<sup>276</sup> A firm grip with the thumb on the back of the neck is essential, as string bends by design increase both the tension of the strings and the pressure on the fingers.<sup>277</sup>

### 3.3.10 Pickup selection

As has been discussed, use of the plectrum in different positions on the string results in different sound timbres.<sup>278</sup> The different pickup positions along the string translate these differences into sound. As different techniques respond more favorably to certain string vibration characteristics, it follows that the correct pickup selection to translate these techniques is essential. The bridge pickup translates the relatively treble sounding tone, the violin equivalent of *Sul Pont*.<sup>279</sup> In contrast, the neck pickup produces a comparatively rounder tone which is more responsive to the string's bass frequencies (*Sul tasto*).<sup>280</sup> Therefore the bridge position is often used for more “cutting” tremble sounds such as pinch harmonics or partial harmonics, whilst the neck pickup's more rounded tone is better suited for smoother lines such as sweep-picking or *legato* hammer-ons and

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<sup>273</sup> Observed in Gilbert, *Terrifying Guitar Trip*, 1995.

<sup>274</sup> Lynch, *George Lynch*, 1990.

<sup>275</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>276</sup> Lynch, *George Lynch*, 1990.

<sup>277</sup> Observed in Paul Gilbert, *Guitars from Mars I*, Japan: YG Factory Inc., 1996.

<sup>278</sup> Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.

<sup>279</sup> Heard in ‘Catapult to Extinction’, Racer X, *Getting Heavier*, Shrapnel Records, Inc., SH-11612, 2003.

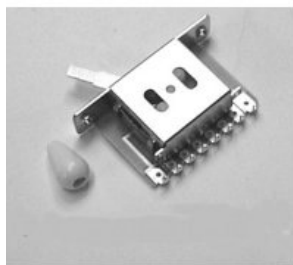
<sup>280</sup> Heard in ‘Love in on Time’, Nitro, *Call to Arms*, M.A.C.E. Music, Inc. 1-50505, 2001.

pull-offs. The middle pickup exhibits characteristics reminiscent of both the neck and bridge pickup and can vary in tone dependent on its exact position and strength.

Although pickup selection is often influenced by technique, it is not always practical to continually change pickup combinations. Therefore, right-hand-intensive music often requires a guitarist to execute multiple techniques with the same pickup selection, irrespective of its suitability. For this reason, it is necessary to practice all techniques using different pickup combinations, so that familiarization with various pickup nuances can be achieved.

Many guitar players in the neoclassical field, such as Yngwie Malmsteen<sup>281</sup> and Joe Stump,<sup>282</sup> can be seen continually switching between different pickup combinations. This is made possible through the use of a five-way pickup selector switch<sup>283</sup> (as pictured below), which can be changed by the little finger on the right hand extremely quickly.<sup>284</sup>

SWS-1-1 - 5-Way Pickup Selector Switch,



Once accustomed to this method of pickup selection, one can continually change between pickup combinations, especially with *legato* passages, minimizing the interruptions to the

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<sup>281</sup> Obrecht, 'Rising Force', pp. 58-74.

<sup>282</sup> Observed in Stump, *Arpeggio Lesson Volume 1*, 2003.

<sup>283</sup> Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.

<sup>284</sup> Observed in Malmsteen, *Masters Series*, 1991.

flow of the music.<sup>285</sup> This is made possible by minimal plectrum use that electric guitar *legato* requires. The respite in right-hand motion allows pickup selection changes to be made with relative ease, which allows a more tailored sound to be achieved.

### 3.4 Timbre

In the accompanying disc, ‘Caprice No.13’ and ‘Caprice No. 20’ utilize a combination of clean and distorted timbres to highlight the contrasting sections within each piece.

Generally speaking, lyric passages respond best to clean timbre whilst virtuosic music is more open to distortion. There are no hard and fast rules, and always the performer must finally ask: ‘Can the timbre be controlled and does the choice of timbre work aesthetically?’ In general, distortion tends to blur the nuances of complex harmonic movement, whilst intervals such as octaves and fifths that are played within a certain range, may benefit from its use. ‘Caprice No. 14’, for example, demands utter clarity and distortion, if used at all, would require tight control; ‘Caprice No.24’ could be played with or without distortion, depending on whether the performer wanted a crystalline or full-blooded effect.

### 3.5 Chapter Summary

Many of these factors both directly and indirectly affect the sound quality of most performances irrespective of the genre. Therefore, it is necessary to have a comprehensive of tone and note colourings of which the electric guitar is capable, before preparing a transcription of *Caprices*. Many of these factors represent the essence of expressionistic performance on the electric guitar, making it possible to inject personality and artistic expression into performance.<sup>286</sup>

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<sup>285</sup> Observed in Stump, *Arpeggio Lesson Volume 1*, 2003.

<sup>286</sup> Morse, *The Complete Styles of Steve Morse*, 1991.

## Chapter Four: Analysis

### 4.1 Introduction

While any electric guitar technique can be used to achieve a musical outcome, certain solutions produce more desirable results than others. For example, while alternate-picking can be used to play arpeggios, the low note per string density is more suited to the economized motion of sweep-picking. More demanding tempi necessitate a greater need for correct technical selection, without which musical continuity can be put at risk. Each musical technique has a corresponding technical counterpart, providing optimum efficiency whilst preserving the greatest musical integrity. This premise was the overall deciding factor in regards to technical aspects within the transcriptions.

The breakdowns shown in Figure 1 illustrate which electric guitar techniques appear in each of the *Caprices*. Although this breakdown is extremely generalized, it provides an overview that can be invaluable when analyzing specific trends and technical combinations. From a fundamental viewpoint it also aids in the identification of the three main techniques discussed hereafter and their subsequent technical variations.

Figure 1

String-skipping sweep-picking with alternate-picking

**I**

**Andante**

*simile*

String-skipping sweep-picking with alternate-picking

Alternate-picking

**II**

**moderato**

*dolce*

Alternate-picking

Consecutive and alternately-picked multiple stops

Sweep-picking and alternate-picking

**III**

**Sostenuto**

*tr*

**Presto**

Consecutive and alternately-picked multiple stops

Sweep-picking and alternate-picking

Alternately-picked multiple stops

**IV**

**Maestoso**

*p*

*f*

Alternately-picked multiple stops



## IX

## X

## XII

**Presto**

3/4

2/4

3 3

3 3

8 12 10 12 10 10 9 7 13 12 12 11 14 12 10 9 7 15 12

3/4

2/4

10 9 7 6 10 8 7

14 15

## XII



## XIII

**Allegro**

The musical score is in 6/8 time, key of B-flat major (two flats). It consists of a single staff with a treble clef. The notation includes chords and single notes, many of which are accented (marked with a 'V' above the note). The fretboard diagram below the staff shows the following fret numbers and fingerings:

Measure	Fret	Fingering
1	10	12
2	12	13
3	10	12
4	15	15
5	14	14
6	13	14
7	12	13
8	11	12
9	10	11
10	9	10
11	8	9
12	7	8
13	6	7
14	8	10

## XIV

[illegible]

## XV

T 6 9 11 12 12 10 8 8 9 11 12  
 A 6 9 11 12 12 10 8 8 9 11 12  
 B 8 7 9 10 9 7 5 6 7 9 10

## XVI

**Presto**

*f* *f* *f* *f* *f* *f*

TAB 3/4 8 7 8 10 11 7 10 8 7 8 10 9 12 11 12 10 12 11 10

Hammer-on and pull-offs with alternate-picking

## XVII

**Sostenuto** **Andante**

Alternate-picking with sweep-picking combinations

## XVIII

**Corrente** **Allegro**

Alternate-picking with consecutive down-strokes

## XIX

**Lento**

Alternate-picking

## XX

**Allegretto**

*dolce*

Alternate-picking with consecutive down-strokes and sweep-picking

## XXI

**Amoroso**  
*con espressione*

T  
A  
B

5 5 7 6 10 6 4 4 7 7 9 7

Alternate-picking and sweep-picking combinations

## XXII

**Marcato**  
*f*

T  
A  
B

13 12 13 14 12 13 10 12 9 10 12 10 8 12 13

Alternate-picking and sweep-picking combinations

## XXIII

**Posato**  
*coll'ottava-----*  
*f*

T  
A  
B

6 11 6 11 6 18 18 17 16 15 19 18 17 16 19 18 17 15 18

Alternate-picking with sweep-picking and hammer-on, pull-offs combinations

## XXIV

**Quasi presto**

T  
A  
B

7 7 7 10 9 7 9 7 7 11 9 7 7 7 10 9 7 9 7

## 4.2 Breakdown and categorization

In order to fully appreciate application of electric guitar technique to the *Caprices*, an analysis from a purely technical standpoint is required. This allows unique observations to be made that may be obscured through more traditional analysis techniques. One of the most important concerns the complex interaction between individual technical elements.

At their most fundamental, the techniques used in the transcriptions can be broken down into three major groups; hammer-ons and pull-offs including finger-tapping, sweep-picking and alternate-picking. Finger-picking techniques also appear occasionally and are split into two categories; “Finger-picking” and “chicken-picking”. However, these are not considered in the aforementioned fundamental groups as they are only offered as alternatives.

These three technical categories represent the bulk of electric guitar technique in general, and are the only techniques needed to perform the transcriptions of the *Caprices*. They can be broken-down into various subcategories being both musical and physical in nature. Additionally, they can appear on their own or in varying combinations dependent on musical content.

With the exception of ‘Caprice No. 6’, which uses one technique almost exclusively, other *Caprices* require technical combinations in order to best reflect their musical content. The table below represents a summarized categorization of techniques that must be mastered in order to play the *Caprices* proficiently on the electric guitar.

#### 4.2.1 Technical categorization

Technique	Technique sub-group	<i>Caprice</i> in which the technique appears
<b>Sweep-picking</b>	String-skipping	1, 2, 3, 24
	Thirds, sixths and octaves	1
	Double and triple stops, quadruple stops	1, 2
	Combination of alternate-picking and Sweep-picking	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 15, 16, 18, 20, 21, 22, 23, 24
<b>Alternate-picking</b>	String-skipping	2
	Straight alternate-picking	2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24
	Double-stops, triple stops, quadruple stops	1, 4, 7, 8, 9, 11, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24
	Thirds, sixths and octaves	3, 4, 7, 8, 23, 24
	With pedal note	20
<b>Hammer-ons and pull-offs including finger-tapping</b>	Single finger finger-tapping	6
	Finger-tapping in combination with Hammer-ons and pull-offs	8
	Double-handed finger-tapping tapping	2, 4, 6, 7, 8, 9, 10, 11, 14, 20, 21, 23, 24
	Hammer-ons and pull-offs in combination with alternate-picking	6, 10, 11, 13, 17, 19, 22, 24

#### **4.2.2 Individual techniques**

While these three techniques may seem a relatively small number to master, breaking them down into both musical and physical aspects results in an infinite number of possibilities. However, from a technical perspective, the areas that require mastery are finite in number.

Alternate-picking, finger-tapping, and hammer-ons and pull-offs, can each be divided into three subgroups based on physical movement; single-string, adjacent string, and string-skipping motion. In contrast, sweep-picking by design cannot be played on a single-string, making that technique divisible into only two of the three categories; adjacent string and string-skipping motion.

There are a number of important observations concerning individual techniques and their functionality within the compositional style of the *Caprices*. The most wide-spread technique that appears in relative isolation is alternate-picking.

### **4.3 Alternate-picking**

Several reasons exist for the widespread use of alternate-picking within nearly all the *Caprices*. One of the most important is the playing of groupings of notes that utilize *staccato* technique. This requires a uniformity of tone, volume, duration and attack, illustrated in Figure 2.

Figure 2

‘Caprice No. 2’, bars 1-4,

**Moderato**

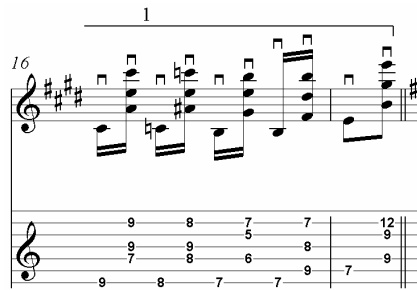
*dolce*

The alteration of the pedal note dictates that a reversal of the plectrum stroke motion is required in order to retain maximum plectrum efficiency. In order to achieve this, consecutive down and up-strokes are used at turnaround points (\*).

The transcriptions also illustrate how extensively alternately-picked double, triple and quadruple stops are utilized within the *Caprices*. Although sweep-picked multi-stops are used occasionally at cadential points as in Figure 4, alternately-picked multi-stops are used in a variety of different musical scenarios.

Figure 4

‘Caprice No. 1’, bar 16



In Figure 5, alternately-picked double and triple-stops are used in order to emphasize the dominant to tonic harmony. The last two motions are consecutive down-strokes which are used to strengthen the final dominant to tonic progression, as the music slows down at the cadential point.



‘Caprice No. 19’, bar 65-66,

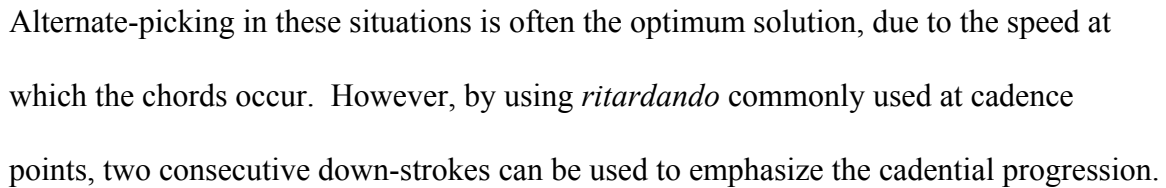


Figure 6

‘Caprice No. 14’, bars 1-6

Given edition



Figure 7

### Transcription

**Moderato**

In increments of two bars, Paganini first states the theme, adding first the 5<sup>th</sup> degree of the chord, and then spreads the chord over a larger range. However, it is the alternate-picking motif used that is of technical interest. The consecutive down-strokes occur on the eighth notes, with the traditionally weaker up-strokes being used for the faster sixteenth notes, which are orchestrated to correspond with the weaker beats of the bar. In such a way, plectrum technique can be used to reinforce musical intention.

It is worth noting that the latitude to utilize this technique is possible only at slower tempi. It is here that consecutive down-strokes are more feasible as the plectrum needs to be lifted back over the already struck strings. Variations of this musical technique appear throughout the transcriptions, which often revert to alternately-picked multiple stops as tempi increase.

## 4.4 Double-handed finger-tapping

Apart from alternate-picking the only other technique to appear in relative isolation from other techniques is double-handed finger-tapping. Although offered as an alternative to the main score, it requires more skill and coordination to execute than the more mainstream techniques. However, once developed it provides an alternative that can produce fundamentally different yet viable musical results.

There are a number of musical reasons why double-handed finger-tapping is desirable, one of which is the contrapuntal nature of certain musical phrases. The ability to autonomously generate melodic and harmonic material in both hands can effectively improve contrapuntal musical realization. The musical example below illustrates how it is possible to divide the notes between the right and left hand.

Figure 8

‘Caprice No. 8’, bar 59

	11	8		9	6
8	5		6	3	
5	13	18	13	13	17
	11	16	11	11	15

One of the advantages of hand independence in note generation is the ability to provide each of the melody lines with contrasting or complementary note colourings, such as different degrees of vibrato. This can add aurally to the independence of each of the melody lines, an aspect that is much more difficult to achieve using a more main stream approach.

Often the musical division between the two hands is not as obvious as in the aforementioned example. On many occasions a certain latitude is needed between adhering to the original idea and creative license, as in Figure 9.

Figure 9

‘Caprice No. 4’, bars 50-55

50

R.H.

L.H.

12 13 13 15  
8 12 8

14 18 17 16 16 15 14 13 13 12 15 14 13 13 12 10 13 13 8 11 8

8 11 11 11 8 8 5 6 5 6 6

A separation into intuitive divisions between the two hands has occurred, with the right hand playing the melody and the left hand the harmonic accompaniment. However, on the first quarter note of bar 52 and certain notes in bar 54, harmony notes are shared between the two hands to increase playability.

As the notes in each hand become closer in pitch, it becomes more difficult to differentiate which hand is playing melody or harmony. At that point, retaining a fluid execution is the deciding factor in note distribution rather than retaining an exclusive separation of melody or harmony between the hands.

Another reason for the frequency in which double-handed finger-tapping occurs, is the extensive use of double, triple and quadruple stops. These commonly arise in introductions, themes, cadential points and modulation sequences. Often at these points it is possible to gain a consistent string tone in the chord if the strings in question span a minimal range of string gauges. In effect, this allows the strings to vibrate in their most homogeneous combination. This technique is most effectively performed by using finger-tapping because of the wide pitch range of the notes, making their fretting on

adjacent strings relatively simple. The chords in Figure 10 illustrate a typical finger orchestration and note dispersal pattern that arises from this concept.

The combination of chords and scalar runs poses a number of technical problems, if finger-tapping is not used throughout. An issue can occur when attempting to change techniques from double-handed finger-tapping to single-note plectrum use in the middle of the bar. This has the advantage of being able to use the palm of the plectrum hand to enforce a strict *staccato* on the scalar runs. However, the problematic nature of switching techniques can make it impractical, and from a string tone perspective, inconsistent. The double-handed solution presents a number of challenges, one of which is the *staccato* notes of the scalar run, which in order to be successful, require finger removal immediately after the note has been tapped. Once double-handed finger-tapping has been developed, this method of creating *staccato* notes is relatively easy and indeed part of the fundamentals of finger-tapping, discussed in depth in the hammer-ons and pull-offs chapter.

## 4.5 Left-hand techniques

In this study the left hand is chiefly in a supporting role for the right. This is due to the right hand being responsible for the majority of the articulations, enunciations and techniques—as it is on the violin. Viewing these right-hand articulations in such a fashion relegates the left hand to a subordinate position responsible for the fretting of notes. That given, however, one or two general points about the left hand should be noted.

Due to the nature of tuning guitar passages, most note combinations can be played at multiple positions along the finger-board. Therefore, left-hand positioning will alter depending on how far around the finger-board the fingers need to stretch, and the arc of the fingers. This arc is determined by the amount of strings that need to be reached over and their positioning on the neck. This can in turn affect the part of the finger pad that frets the strings, with passages played on the lower 6<sup>th</sup> and 7<sup>th</sup> strings (depending on neck width) requiring a considerable arc. Additionally, the thumb is required to move towards the bottom of the neck to a certain extent as the fingers reach over more strings. This gives both maximum reach and accessibility of the fingers.

The above point is to a large extent based around the assumption that the left hand is in a correct position relative to the neck, so to enable maximum note access: this invariably places the left-hand fingers close to ninety degrees to the finger-board. Due to the fact that multiple positions can be used to obtain the same note pitches, it is vital to preserve the accurate positioning of the thumb on the back of the neck for optimum left-hand finger angle.

## 4.6 Technical combinations

There are a number of observations that need to be made about the co-dependent relationship between techniques. This study focuses on the separate techniques and how they combine contextually within the *Caprices* at both the micro and macro levels.

### 4.6.1 Combination of sweep-picking and alternate-picking

Used extensively throughout the *Caprices*, the combination of sweep-picking and alternate-picking is an extremely effective musical tool, so much so that it appears not as separate techniques but rather as a technique subgroup under the main heading of sweep-picking. Wherever triadic harmony is amalgamated with scalar melody, the technical combination of sweep-picking and alternate-picking is most prevalent.

An example of this occurs in the first melody motif of ‘Caprice No. 16’ in bar 1.

Figure 11

‘Caprice No. 16’, bar 1

presto

The musical notation for the first bar of 'Caprice No. 16' is shown in 3/4 time, marked 'presto'. The melody is written on a single staff in B-flat major (two flats). It begins with a forte (f) dynamic and a sweep-picked eighth-note triplet (Bb, A, G). This is followed by an eighth-note triplet (F, Eb, D) with a forte (f) dynamic. The melody then continues with a series of eighth notes: C, Bb, A, G, F, Eb, D, C. The final eighth note is a Bb, which is part of a final sweep-picked eighth-note triplet (Bb, A, G). The notation includes various picking marks (V) and dynamic markings (f).

Below the staff, the fret positions for each note are indicated by numbers on a six-line grid representing the strings (E, B, G, D, A, E from top to bottom):

String	1	2	3	4	5	6	7	8	9	10	11	12
E												
B												
G												
D												
A												
E												
B												

The compositional technique of building complex melody within a strong harmonic framework is the mainstay of the *Caprices*. This factor explains the regularity in which alternate-picking and sweep-picking combinations arise.

#### 4.6.2 Combination of hammer-ons, pull-offs and alternate-picking

Another technical combination that occurs regularly is that of hammer-ons and pull-offs in conjunction with alternate-picking. Unlike sweep-picking/alternate-picking combinations in which notes cannot be played unless the techniques are combined, alternate-picking and hammer-on and pull-off combinations can be used as a timbral alternative to plectrum-generated notes. The *legato* feel of the hammer-ons and pull-offs render them a viable alternative in a variety of different playing scenarios.

Although a plethora of technical combinations are available, they are not always the first option, as in the example below. The initial vibration is created with the plectrum using a down-stroke, with the rest of the notes being played as either pull-offs or hammer-ons. This is one of the fundamental combinations of hammer-ons and pull-offs with alternate-picking. The minimal plectrum use creates a smooth *legato* string tone if plectrum grip pressure is kept to a nominal level.

Figure 12

‘Caprice No. 22’, bar 40 and 41

tr

tr

tr

tr

tr

tr

p h p h p

p h p h p

p h p h p

p h p h p

10 9 10 9 10 9 10 9 10 9 10 10 11 10 11 10 11 10 11 10 11 10

One of the by-products of this approach is the ability to retain both picking continuity and string tone consistency by accenting the first note of each group of six with a plectrum



stroke. Another advantage is simplifying the trills execution when played with only hammer-ons and pull-offs, rather than complex plectrum motion. This simplification is one of the numerous advantages of utilizing hammer-ons, pull-offs and alternate-picking in these playing scenarios.

Unlike Figure 12, where plectrum motion was kept to a minimum, the example below illustrates an even balance between both hammer-ons and pulls-offs, and alternate-picking. The combination of the two techniques is needed in this case to more exactly imitate the neighbour-note bow phrases.

Figure 13

‘Caprice No. 10’, bars 5 and 6

Original score

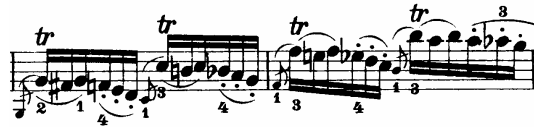
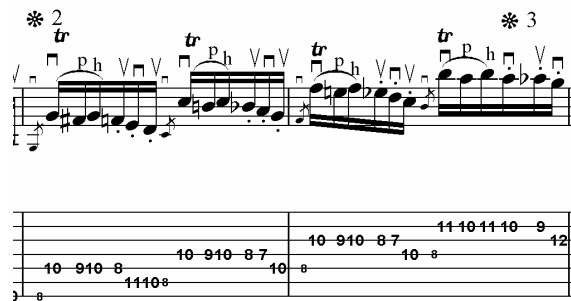


Figure 14

Transcription



One of the advantages of utilizing this kind of combination of techniques is that it can be used to exactly imitate or slightly alter the feel of certain passages. For example, in the violin version the first three notes are played with a single bow stroke and the second

three with a different stroke in *staccato* form. To better imitate the original, the first three notes are played with one plectrum stroke followed by a pull-off and a hammer-on whilst the second three utilize alternate-picking. By lowering the palm of the plectrum hand onto the strings in combination with alternate-picking, it is possible to more exactly recreate the original attack and intention of the passage.

Imitation is not always the goal in performance and it is possible to utilize the combination techniques to insert creativity into musical phrasing. The example below illustrates a possible method of playing embellishments such as grace notes. By playing the grace notes with hammer-ons and the strong melody and harmony notes with alternate-picking, the combination techniques can help to reiterate the note hierarchy.

Figure 15

‘Caprice No. 11’, bars 5-6

The musical score for 'Caprice No. 11', bars 5-6, is presented in three staves. The top staff (C.P.) features a melody with grace notes (h) and hammer-ons (hh) over a series of eighth notes. The middle staff (F.P.) provides harmonic support with similar rhythmic patterns. The bottom staff shows a sequence of fret numbers (8, 12, 10, 12, 9, 7, 8, 10, 8, 7, 8) corresponding to the notes played. The notation includes various musical symbols such as beams, slurs, and specific picking/hammer-on indicators.

In contrast to the previous musical example, recreating the exact phrasing did not take precedence over technical and musical creativity.

## 4.7 Chapter Summary

From the above analysis it is possible to discover a hierarchy of techniques and combinations of techniques allied to the performance style of the *Caprices*. These discernable hierarchies now usefully become the basis for developing new exercises to prepare for performance.

It can be argued that the degree of autonomy in which a technique appears is directly related to the size of the musical phrase analyzed. Having recognized this argument, alternate-picking and double-handed finger-tapping are the main techniques that occur in relative autonomy throughout the *Caprices*. Both techniques appear in varied permutations ranging from alternately-picked multi-stops, to eight-fingered finger-tapping.

The *Caprices* are musical in nature and often require multiple techniques in different combinations. The ability to combine these techniques is essential as is the ability to fluently change between them. This is due to the frequency with which these combinations occur. They range from sweep-picking and alternate-picking to hammer-ons, pull-offs and finger-tapping combinations.

As has been discussed, there are a number of reasons why both individual and technical combinations arise. In the case of the *Caprices*, musical framework dictates the approach, and informs the frequency in which techniques arise.

## Chapter Five: Sweep-picking

### 5.1 Introduction

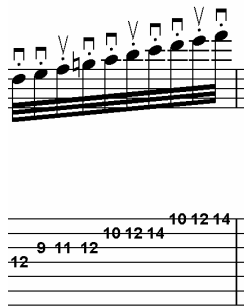
Best described as a dragging or pushing of the plectrum from one string to another,<sup>287</sup> sweep-picking is an extremely effective method of playing both scalar patterns and arpeggios.<sup>288</sup> By striking two or more adjacent strings in a continuous movement, the right hand “sweep” maximizes the efficiency of the plectrum hand motion.<sup>289</sup> Although not exclusively utilized in the performance of single-note melodies, it is in this context that sweep-picking excels, developing speed in conjunction with a uniform string tone.

Figure 1 illustrates sweep-picking<sup>290</sup> with Figure 2 providing a contrasting and arguably more conventional alternate-picking solution.

Figure 1

Sweep-picking

‘Caprice No. 7’, bar 67, beat 2



<sup>287</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>288</sup> Some times referred to as “Rake Picking”, Marshall, *Yngwie Malmsteen’s Style*, 1986.

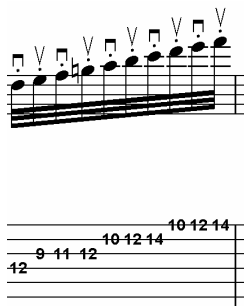
<sup>289</sup> *Ibid*

<sup>290</sup> Frank Gambale, *Speed Picking*. Milwaukee: Hal Leonard Publishing Corporation, 1994, p. 2.

Figure 2

### Alternate-picking

‘Caprice No. 7’, bar 67, beat 2



The sweep-picking technique used in Figure 1 reduces plectrum hand movement, by utilizing the same downward motion to strike two notes when moving between strings.<sup>291</sup> Striking two notes with the same motion reduces the physical movement by a third when applied to three-note-per-string scales.<sup>292</sup> However, in the case of arpeggios where note density per string decreases, the efficiency of sweep-picking enables speed to remain consistent.<sup>293</sup>

## 5.2 Fundamentals

### 5.2.1 Notation

As can be seen in Figures 1 and 2 the plectrum strokes are notated using the same conventions as bowing strokes. An up-stroke is notated with a V and a down-stroke with a ∏. It is imperative when practicing these exercises to adhere to the written strokes, as the exercises have been designed specifically to exploit different aspects of sweep-picking used within the *Caprices*. A musical phrase may be prepared for sweep-picking two bars prior to the actual event taking place. Any alterations to the plectrum strokes

<sup>291</sup> Gambale, *Speed Picking*, p. 2

<sup>292</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>293</sup> Gambale, *Speed Picking*, p. 3.

can significantly change the efficiency factor and in some cases make the passage unplayable.

### 5.2.2 Technical areas of concern

Before attempting sweep-picking, it is prudent to familiarize oneself with common problem areas. This allows them to be avoided, whilst alleviating the need to relearn techniques incorrectly developed at the fundamental stage.

Although Figure 1 seems obvious in its execution, there are a number of primary concerns that arise in conjunction with this extract and affect sweep-picking in general. The first of which is that the “sweep” must be played in one motion. A common error when initially attempting sweep-picking is the use of separate down-strokes instead of one continuous motion.<sup>294</sup> Far from optimizing the plectrum motion, this action doubles the amount of movement needed to play successive notes.<sup>295</sup> Using consecutive down-strokes is a valid technique; however, in keeping with the sweep-picking theme of optimized motion, its usefulness is minimal.

Another area of concern is the synchronization that must occur between the two hands.<sup>296</sup> Accurate synchronization results in phrases and notes that possess both a uniform tone and precise note duration.<sup>297</sup> Although simple in theory, constant vigilance is needed throughout the fast-paced arpeggios and scales of the *Caprices*. Even when an advanced

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<sup>294</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>295</sup> *Ibid*

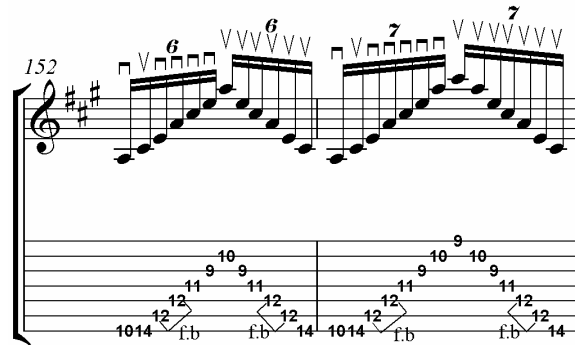
<sup>296</sup> *Ibid*

<sup>297</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

level of technical command has been achieved, sweeps that span six strings require constant focus.<sup>298</sup> Figure 3 illustrates a case in point extracted from the transcriptions.

Figure 3

‘Caprice No. 24’, bars 152-153, finale



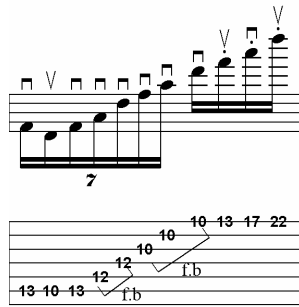
### 5.2.3 Finger-Barré

Figure 3 introduces the finger-barré technique, which increases efficiency but can adversely affect the synchronization between the two hands. Simply stated, a Finger-Barré is an efficient method of playing two or more notes that occupy the same fret on different strings. Although minimum finger movement is necessary, successful articulation requires that the Finger-Barré be removed incrementally, allowing the notes to reach their full duration. This must occur in conjunction with the plectrum striking the strings in exact synchronization. Figure 4 illustrates two fingers fretting five strings.

<sup>298</sup> Gilbert, *Intense Rock*, 1988.

Figure 4

‘Caprice No. 24’, bar 138, Variation 11



This type of combination technique requires that both hands are developed concurrently and not as independent entities.

#### 5.2.4 Sweep-picking and dampening

One of the secondary elements requiring development in conjunction with sweep-picking is palm dampening. Synchronization between the two hands is aided by precise dampening and muting, to prevent notes ringing past their desired duration.<sup>299</sup> This in turn makes the rhythmic framework more apparent, something that can be easily obscured by the mechanics of sweep-picking.<sup>300</sup>

Irrespective of either upward or downward motion, palm dampening is used to control a number of elements such as tone,<sup>301</sup> note duration and superfluous string noise.<sup>302</sup> The issue of string noise and its control is especially prevalent in musical situations where a low density of notes over a large number of strings occurs, such as arpeggios.

<sup>299</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>300</sup> Gilbert, *Intense Rock*, 1988.

<sup>301</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>302</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.



Accurate dampening also aids in the articulation of each note and the audibility of its initial attack.<sup>303</sup> The more strings that the sweeping technique covers the greater the risk that subsequent notes will be obscured after the initial attack.<sup>304</sup> This problem is fundamental to sweep-picking<sup>305</sup> and often occurs when accurate dampening and the articulation of notes is replaced by premature attempts to increase tempo.<sup>306</sup>

### 5.2.5 Plectrum angle

With sweep-picking being either a pushing or pulling of the plectrum across the strings, the issue of retaining the correct plectrum angle arises.<sup>307</sup> By maintaining the same plectrum angle relative to the string a uniformity of tone throughout a melody line can be achieved.<sup>308</sup> The string tone uniformity stems from the right hand sweeping across the strings with the same plectrum angle.<sup>309</sup>

One of the fundamental problems arising is the twisting of the wrist as opposed to pushing it evenly across the strings. This can occur when attempting to reach notes at the upper extremities of the sweep. A number of reasons can be cited for the wrist twisting phenomenon including changing string gauge and a failure of the wrist to reach the correct position before the melodic pattern changes direction.

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<sup>303</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>304</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>305</sup> *Ibid*

<sup>306</sup> Gilbert, *Intense Rock*, 1988.

<sup>307</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>308</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988. ; Yngwie J Malmsteen, *Play Loud! The Second Movement, Arpeggios*, Japan: YG Factory Inc., 1995.

<sup>309</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988. ; Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

### 5.2.6 Plectrum pressure and string tension

Within the technique of sweep-picking the ability to make slight alterations in plectrum grip pressure is useful and directly relates to the gauge of the string. Pressure variations can take place to compensate for the changing string gauge and string tension. For example, the pressure used to play the 1<sup>st</sup> string can vary noticeably to that used to play the 6<sup>th</sup> string.<sup>310</sup> The alteration of pressure in controlled increments as the right hand moves across the strings can allow a more uniform tone and volume to be achieved.<sup>311</sup>

Unlike alternate-picking, which can utilize a more varied degree of plectrum pressure, sweep-picking is a technique which requires more subtle alterations.<sup>312</sup> This is largely due to the mechanical motion sweep-picking employs when moving from one string to the next.<sup>313</sup> Within alternate-picking, the arc of the plectrum has more space to strike the new string.<sup>314</sup> This contrasts the sweep-picking motion which pushes the plectrum onto the next string.<sup>315</sup> Consequently, string tone consistency is easier to achieve whilst accented dynamics become more difficult to perform.

The transcriptions make use of a low B string (a trend popularized by modern rock culture),<sup>316</sup> which requires discussion in conjunction with plectrum grip pressure. Due to its tension and tuning, the low B string's displacement is often greater than its neighbouring strings. Therefore, it can require a lighter plectrum pressure when it is struck. The B string should, technically speaking, be a different length in order to retain

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<sup>310</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>311</sup> Observed in Malmsteen, *Play Loud! The Second Movement, Arpeggios*, 1995.

<sup>312</sup> *Ibid*

<sup>313</sup> Observed in Stump, *Arpeggio Lesson Volume I*, 2003.

<sup>314</sup> Petrucci, *Rock Discipline*, 1991.

<sup>315</sup> Marshall, *Yngwie Malmsteen's Style*, 1986.

<sup>316</sup> Bands such as Korn make extensive use of the low B in their music.

the same tension and rigidity of all the other strings. However, due to the physical limitations of electric guitar construction this is not always the case.<sup>317</sup>

### **5.2.7 The development of sweep-picking in conjunction with alternate-picking**

The analysis section of this study clearly identifies the interdependent relationship between alternate-picking and sweep-picking. This requires a certain degree of concurrency in the development of both techniques. Having acknowledged this point, the function of alternate-picking and its execution is assumed knowledge and requires development before attempting combination exercises.

### **5.2.8 The odd and even plectrum stroke formula**

Plectrum strokes by design are either up or down-strokes, of which the number of strokes per string is dictated by musical content. In order to take advantage of the economy of motion that sweep-picking provides an odd number of plectrum strokes are required per string.<sup>318</sup>

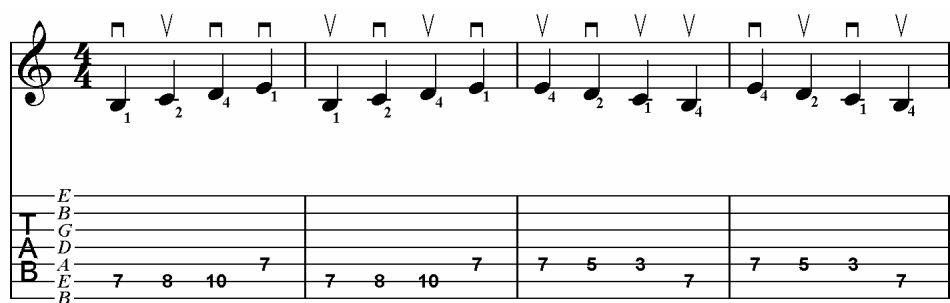
The common three-notes-per-string format requires the correct initial stroke in the same direction as the melodic contour. Figure 5 illustrates the detrimental impact on plectrum efficiency caused by incorrectly assigning the initial stroke.

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<sup>317</sup> One of the exceptions being the Hipshot® Bass Xtender Drop D utilized for instantaneous tuning changes, [http://www.hipshotproducts.com/cart.php?m=product\\_detail&p=87#](http://www.hipshotproducts.com/cart.php?m=product_detail&p=87#); accessed May 20<sup>th</sup> 2007.

<sup>318</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

Figure 5



In bar 1 the initial stroke moves in the same direction as the melodic contour, facilitating the sweep between D and E notes.<sup>319</sup> In contrast to this, bar 2 shows the initial stroke in a contrary direction to that of the melody preventing the sweep between strings. This requires the plectrum to be lifted over the already struck D note to play the E note at the string crossing point.<sup>320</sup> Bars three and four illustrate the same principle on a descending pattern.

### 5.2.9 Sweep-picking and bow technique

A fundamental understanding of continuous on-the-string and off-the-string bowing techniques *jeté*, *ricochet*, *up-bow staccato* and *down-bow staccato* is required if one is to appreciate fully the relationship between these continuous motion bowing strokes and sweep-picking.

Up-bow and down-bow *staccato* differ from *jeté* and *ricochet* in that the bow never leaves the string; the note duration is controlled by the physical stopping of the bow stroke.<sup>321</sup> Although this differs from the single motion of sweep-picking, where the plectrum is pushed “through” the notes, it demonstrates many similarities to the double-down-strokes. These are often avoided in sweep-picking due to the speed restrictions, the

<sup>319</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>320</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>321</sup> Ivan Galamian, *Principles of Violin Playing and Teaching*. London: Faber and Faber Ltd, 1964, p. 78

performer having to strike the string and lift the plectrum back over the string in question in order to re-strike it. While both the up-bow and down-bow *staccato* require less motion from the wrist to reactivate the string vibration, there is a speed restriction created by the stopping and starting motion of the bow.<sup>322</sup> This restriction is similar in principle to the one that occurs when using double-down-strokes.

Transforming the muscular trembling described in relation to the continuous bowing motion of *staccato* into a controlled usable musical technique can be extremely difficult.<sup>323</sup> In principle this exhibits techniques and common concerns to that of trem-picking, where this kind of muscular motion is utilized to its full extent.<sup>324</sup> These technical similarities range from plectrum and bow pressure against the string,<sup>325</sup> to the need to control the overall speed of the muscular motion in order to harness it for practical use at different tempi.<sup>326</sup>

Both *jeté* and *ricochet* present similar concerns, motions and string tone nuances, to sweep-picking. Although sweep-picking does not rely on the natural bounce of the strings as do the different *ricochet* bowing techniques, it is similar in a number of ways. To cite one obvious example, once the initial motion has started in sweep-picking the wrist follows from one string to another in a manner analogous to *ricochet* where the bow is “thrown onto the string”.<sup>327</sup>

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<sup>322</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 78

<sup>323</sup> *Ibid*

<sup>324</sup> Angelo, *Speed Kills*, 1991.

<sup>325</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 79.

<sup>326</sup> Angelo, *Speed Kills*, 1991.

<sup>327</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 81.

There are a number of parallel concerns when comparing sweep-picking to the actual motion of ricochet bowing, one of the most important being controlling the distance the bow bounces from the string. With speed being a primary concern in both techniques, it is necessary to utilize the optimum distance that either the bow or the plectrum is removed from the strings. After the initial bounce, the succeeding bounce is controlled by the pressure of the first finger.<sup>328</sup> In sweep-picking, controlling both the plectrum pressure and amount of pick depth used to strike the string is also the responsibility of the first finger (a premise only valid if the first finger and thumb grip the pick).

Another similar concern is which part of the plectrum strikes the string and how much of the pick comes into contact with the string; too much pick and it can get “snagged” in the strings, too little and notes can be missed or not struck properly. *Ricochet* bowing has similar concerns in which part of the bow creates the required bounce, with the distance from the tip of the bow being the determining factor.<sup>329</sup>

As in sweep-picking, the first stroke of *ricochet* bowing, which can occur from any height off the strings, can be accented as this is the initial “throw down” of the bow. However, both bowing and picking techniques share a difficulty in isolating individual strings for extreme dynamic accents, especially at fast tempi, once the initial motion has begun. Although possible, speed often needs to be sacrificed in order to execute this with accuracy. In bowing, the height of the bounce needs to be adjusted whilst in sweep-picking an increased amount of plectrum striking the string is required to create the accent.

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<sup>328</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 82.

<sup>329</sup> *Ibid*

Movement between the strings aids the bounce of the bow with the movement being created entirely with the bowing arm.<sup>330</sup> This motion is similar in sweep-picking where the movement between the adjacent strings is executed using the plectrum arm.

The three major problem areas with *ricochet* bowing are also mirrored in sweep-picking and appear here in their sweep-picking counterparts.<sup>331</sup>

1. The plectrum requires the application of constant pressure; holding it with too much pressure can restrict natural movement.
2. Utilization of the wrong part of the plectrum can adversely affect the desired speed, pick angle and wrist angle and cause too much of the plectrum to strike through the string.
3. The natural motion of the plectrum can be affected by incorrect tension in either the string or plectrum grip. String gauge can play a large part in the fluid motion of the plectrum across adjacent string-sweeps.

### 5.2.10 Summary

As was acknowledged at the beginning of this section, these are fundamental observations and conceptual comparisons rather than absolute parallels. Comparisons serve to facilitate a working knowledge of continuous bowing motions and how they relate to their transcribed sweep-picking counterparts. The similarities between technical problems and musical solutions can be arguably described as inherent to many stringed instruments.

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<sup>330</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 83.

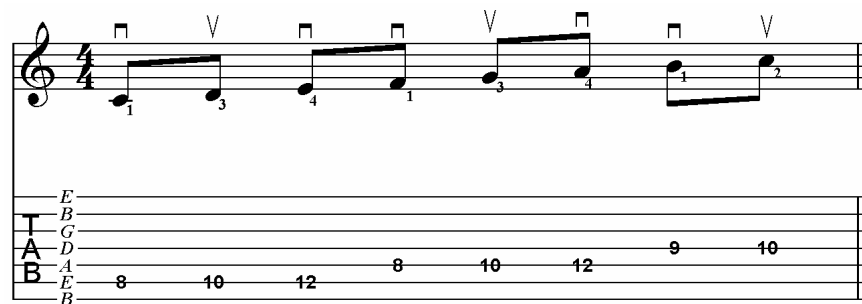
<sup>331</sup> “Trouble with the *ricochet* often occurs when one of three things is being done: (1) the bow is being held too tightly, (2) the wrong part of the bow is being used for the speed desired, (3) the natural bounce is being interfered with because of tenseness in the natural springs”. Galamian, *Principles of Violin Playing and Teaching*, p. 83.

### 5.3 Micro Elements

Scalic melody is prevalent throughout the *Caprices* and fundamental to the majority of tonal music. This makes it an obvious point from which to examine the micro-elements of sweep-picking.

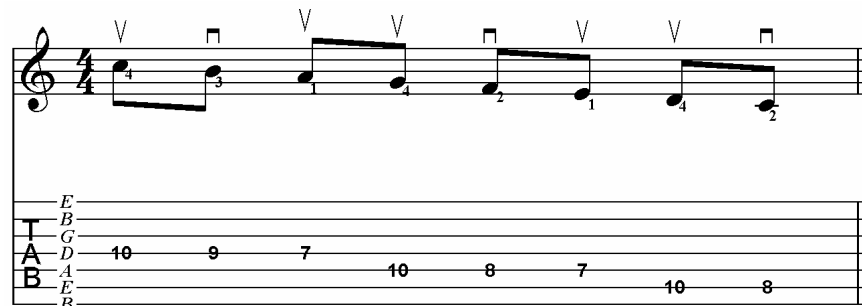
One of the most efficient methods of playing scalic patterns within a static position is in three-notes-per-string format,<sup>332</sup> illustrated in Figure 6.

Figure 6



This shows how a basic ascending C major scale can fit into the framework of sweep-picking. As has been discussed, the initial stroke moves in the same direction as the scale facilitating the economized motion of sweep-picking between E and F and A and B.

Figure 7



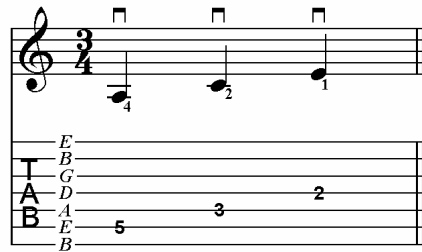
<sup>332</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989. ; Gilbert, *Intense Rock*, 1988.



### 5.3.1 Arpeggios

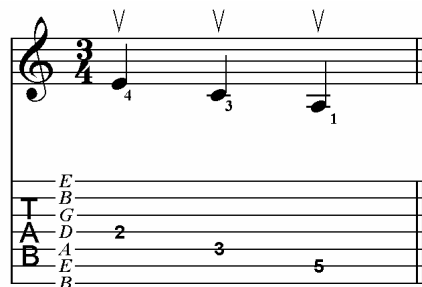
Due to their low note density per string, arpeggios have become synonymous with sweep-picking. Figure 8 shows how sweep-picking can be applied to a simple triadic motif, whilst illustrating economized plectrum motion.

Figure 8



The fluidity of motion needed for sweep-picking requires development in both upwards and downwards directions. The focus of Figures 8 and 9 is to develop that exact motion, whilst allowing the right and left hand to build up a rudimentary synchronization.

Figure 9



In contrast to Figures 6 and 7, sweep-picking across multiple strings creates a number of problematic areas.<sup>333</sup> The two motions required for Figures 8 and 9 respectively, are a pushing and pulling motion.<sup>334</sup> This motion presents the right hand with the challenge of continuously and fluidly repositioning itself in order to retain the same plectrum angle relative to the string. To achieve this effectively, both the elbow and the wrist must function as one entity. The wrist must retain a consistent plectrum angle and dampening,

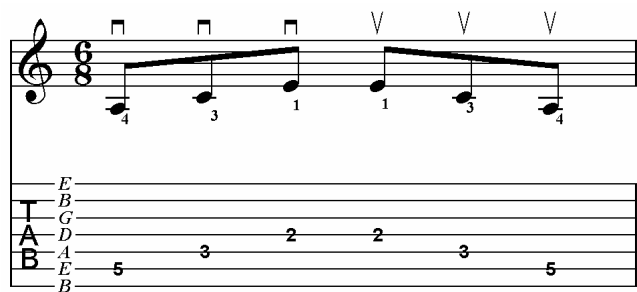
<sup>333</sup> Gilbert, *Intense Rock*, 1988.

<sup>334</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

whilst the elbow delivers the plectrum to its destination string(s).<sup>335</sup> The more strings that sweep-picking encompasses, the more prone arpeggios become to string noise and plectrum inconsistencies, such as string tone variations and dampening issues.<sup>336</sup>

The combination of both upwards and downwards sweeping motion in Figure 10 allows the right hand to develop the ability to reverse the direction of the sweep. This is done with an even number of notes on the highest string.<sup>337</sup>

Figure 10



One of the fundamental abilities required when sweep-picking, is the capacity to alter the direction of the sweep in a fluent manner. This gives the exponent of sweep-picking a virtually inexhaustible technical arsenal that can be applied to most musical contexts.

Altering the direction of sweep-picking brings a number of problem areas into sharp focus, an important one being that which occurs at the turnaround point. In the above example, the E, where the turnaround occurs, is at risk of not being played for its full duration if the plectrum does not move far enough from the string. Moreover, premature anticipation of the turnaround point can result in the elbow not accurately delivering the plectrum to the note previous to the direction change. The wrist then needs to alter its

<sup>335</sup> Observed in Becker, *The Legendary Guitar of Jason Becker*, 2007. ; Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>336</sup> Gilbert, *Intense Rock*, 1988.

<sup>337</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

angle in order to reach the desired notes, which can result in string tone inconsistencies and incorrect note durations.

Practical application of the sweep-picking reversal can be seen in the extreme string-skipping arpeggios of ‘Caprice No. 1’. Although, from a note range perspective Figure 10 is less extreme, it exhibits similar areas of concern.

### **5.3.2 Summary**

Retaining the same plectrum angle relative to the string is a critical factor in achieving string tone uniformity throughout melodic lines and arpeggios. The correct angle is a result of accurate coordination between the right wrist and elbow. If other problem areas such as note duration and synchronization are remedied at a fundamental level, technical evolution should be relatively straightforward.

As has been shown, sweep-picking can be broken down into multiples of odd and even notes per string; the odd notes facilitating sweep-picking whilst the even notes diminish plectrum efficiency, all of which is reliant on the correct application of the initial stroke. In order to take advantage of the plectrum efficiency that sweep-picking promotes, exercises and musical phrases utilize odd numbered note groupings per string. For scalar forms three-notes-per-string format is most commonly used, whilst arpeggios utilize either one or three-notes-per-string.

In contrast to alternate-picking and other techniques, the development of sweep-picking is more rapid in its technical progression relative to practice time.<sup>338</sup> Sweep-picking can

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<sup>338</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

often offer a more streamlined solution to complex melodic and harmonic musical patterns.

## **5.4 Macro elements**

### **5.4.1 Introduction**

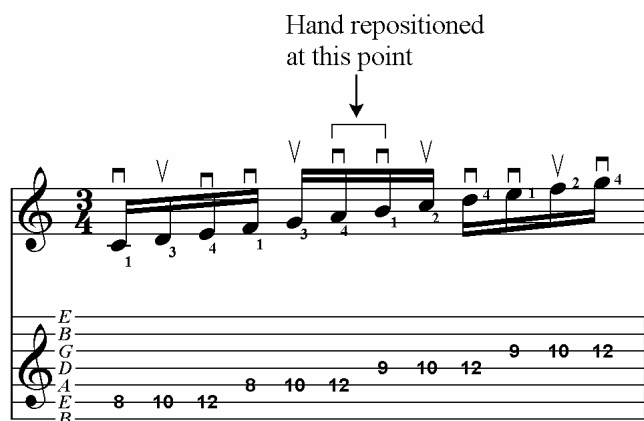
Examination at the micro level has revealed fundamental forms, issues and technical minutiae from which sweep-picking as a technique can evolve. Sweep-picking's logical evolutionary development beyond the micro level begins within the scalic framework. Numerous in its applications within the *Caprices*, the techniques development has many widespread musical applications beyond the music of Paganini.

As was noted earlier, the three-note-per-string pattern is one of the most efficient methods of playing diatonic scales on the electric guitar. Generally speaking, sweeps occur in the same physical direction as the scalic pattern. Both ascending and descending versions require practice owing to their opposing physical motion.

### **5.4.2 Practical application for sweep-picking scalic figures**

Figure 11 naturally expands on the scalic theme presented in Figure 6, doing so by encompassing four strings in three-note-per-string format. Each subsequent string is reached by means of the sweep from its previous counterpart.

Figure 11



One of the main techniques that Figure 11 addresses is right hand repositioning whilst retaining the same plectrum angle relative to the string.<sup>339</sup> Plectrum angle retention is the main focus of this exercise, being accomplished through one of two methods, both of which have equal merit. The first method is simply to reposition the hand at every new string.<sup>340</sup> This gives the guitarist the ability to retain a rigid plectrum hand position and in turn minimizes string tone inconsistencies that may occur when employing a more fluid position.<sup>341</sup> However, having the right hand in a continual state of flux can make it more susceptible to potential problems in the areas of dampening and superfluous string noise.

Identification of the second method lies in the symmetrical patterns<sup>342</sup> that arise within the tablature's fingering.<sup>343</sup> The first three notes on the E string are mirrored on the finger-board by the second three on the A string, with a different pattern being repeated on the next two strings. This division provides a logical point where the right hand can

<sup>339</sup> Observed in Frank Gambale, *Chop Builder, The Ultimate Guitar Workout*, Seattle: R.E.H. Publications Inc., 1994.

<sup>340</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>341</sup> *Ibid*

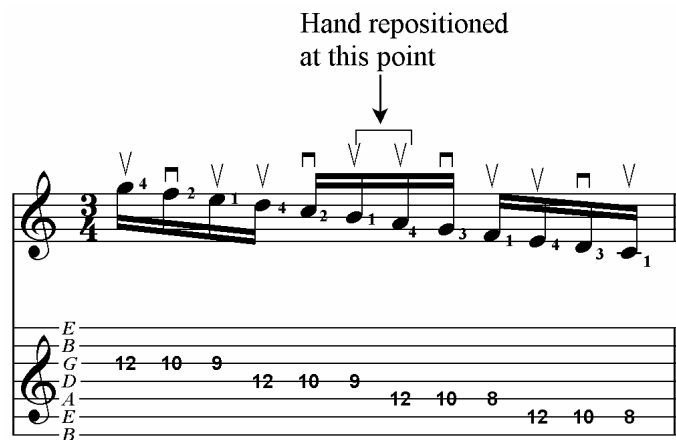
<sup>342</sup> String symmetry discussed and analyzed by Nick Bowcott, 'The Guitar Lesson from Hell'. *Guitar World*, Vol. 12, No. 9, September 1991, pp. 58-59.

<sup>343</sup> A similar method is used by Paul Gilbert for memorization of repeated finger patterns in consecutive octaves; Gilbert, *Intense Rock*, 1988.

be repositioned comfortably. As the repositioning takes place where the sweep occurs, it is a simple matter of integrating both the repositioning and sweep-picking motion into one continuous movement, to attain the new right-hand position.<sup>344</sup>

Figure 12 illustrates the exact opposite motion, with the initial stroke in the direction of the scale in its descending form. In contrast to Figure 11, the sweep-picking motion that is being developed is a dragging motion.<sup>345</sup>

Figure 12



In the ascending version lowering the palm onto the string can help to control the string vibration.<sup>346</sup> However, the descending version already has the palm resting on the subsequent string prior to the plectrum arriving. This makes it relatively easy to then release palm pressure in order for the string to achieve a degree of vibration when struck. For this reason, some players find it easier to control the tone of descending rather than ascending sweep-picking patterns.

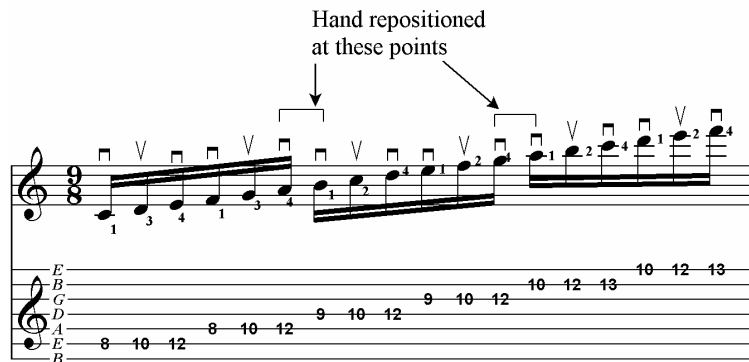
<sup>344</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>345</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>346</sup> *Ibid*

Within the framework of four strings, a minimal amount of plectrum hand repositioning can be used. However, in order to utilize sweep-picking to its maximum potential, it is necessary to expand the exercise to encompass six strings. Figure 12 illustrates where the right hand must periodically change position in order to efficiently retain the plectrum angle relative to the string.

Figure 13



There are a number of reasons for utilizing the specific scale in this position on the neck. The natural symmetry of two-string groupings occurs when three-note-per-string scales start on either the first or seventh degree of the diatonic scale. This aids finger pattern memorization, thus allowing a less hindered approach when familiarizing oneself with the physical sweeping motion required to traverse six strings of various gauges.

#### 5.4.2 Summary

Although, within the *Caprices* this kind of six-string sweep-picking pattern never occurs in its entirety, it is important to note that it does appear in varying degrees. At this fundamental scalic level, the ratio of sweeps per note is relatively low. However, as the technique expands to encompass arpeggios the ratio increases markedly.

## 5.5 Static position arpeggios

### 5.5.1 Introduction

Simply stated, static position arpeggios require no left hand position shifts, making them an ideal vehicle for the introduction of sweep-picking.<sup>347</sup> In contrast to three-note-per-string sweep-picking patterns, sweeps per string in this format can often be a one to one ratio spanning five or more strings.<sup>348</sup> This provides the advantage of playing many notes with one plectrum motion, with the articulation stemming from the left hand.<sup>349</sup> Once developed, it can result in seemingly impossible speeds that are extremely hard to accomplish though alternate-picking.<sup>350</sup> Therefore, in many musical contexts sweep-picking surpasses any other techniques, for both ease and speed of execution.

### 5.5.2 Three-string triads

In one of its simplest forms the chordal arpeggio appears as a three-note triadic figure,<sup>351</sup> which is illustrated in Figures 14 and 15 in both ascending and descending forms.

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<sup>347</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>348</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>349</sup> Frank Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>350</sup> Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>351</sup> Observed in Marshall, *Yngwie Malmsteen's Style*, 1986.



Figure 14

‘Caprice No. 22’, bar 30

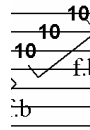
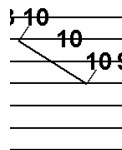


Figure 15

‘Caprice No. 22’, bar 27



Although the obvious characteristic of this form of picking is the singular motion required, less evident are the musical possibilities that can be derived from this technique.<sup>352</sup> Largely diatonic, the *Caprices* utilize triadic forms in various finger patterns for both position transitions and chromatic modulation.<sup>353</sup> However, they still

<sup>352</sup> An example of which can be heard in ‘Serrana’, Jason Becker, *Perspective*, Warner Bros, 23018, 1996.

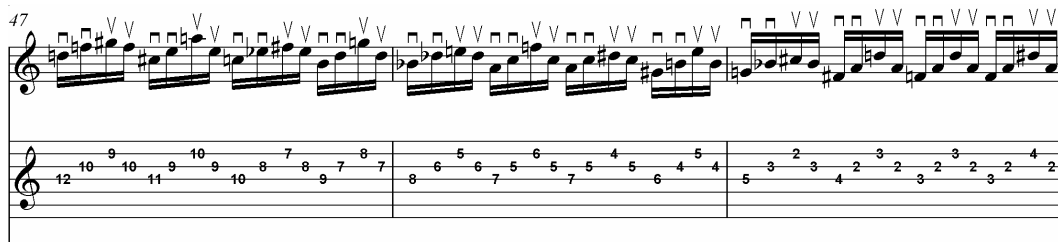
<sup>353</sup> Heard in ‘Demon Driver’, Malmsteen, *Eclipse*, 1990. ; Stump, *Arpeggio Lesson Volume 1*, 2003. ; Malmsteen, *Masters Series*, 1991.



Another issue relates to the plectrum strokes enclosed in brackets. These represent a secondary option in order to facilitate the upwards sweep on the final two notes. By ending the first sweep one note sooner, the exercise takes on a more symmetrical form, beginning and ending with two swept notes in opposite directions.<sup>355</sup> This interruption to the sweep-picking motion in order to strike the third note can increase the difficulty level at this point. However, it facilitates the second sweep which can increase overall speed. An illustration of why a symmetrical plectrum stroke is important to develop occurs in ‘Caprice No. 5’, shown in Figure 17.

Figure 17

‘Caprice No. 5’, Bars 47-49



This issue brings to the forefront an important point, illustrating from a technical perspective, how the second part of a phrase can often influence the execution of the first.

Within the basic diatonic scale, there are three main types of triadic patterns, the minor,<sup>356</sup> the major,<sup>357</sup> and the diminished.<sup>358</sup> All three are prevalent throughout the *Caprices* making familiarization with them essential to the playing methodology. Within a static position on the fret board, cycling between three positions is possible, whilst utilizing the same sweep-picking pattern introduced in Figure 16.

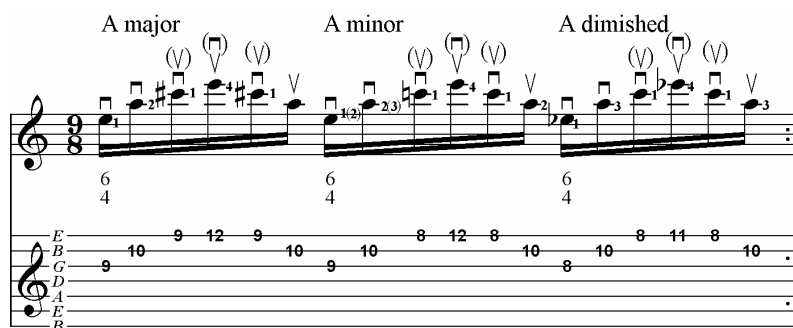
<sup>355</sup> Similar in principle to the arpeggio technique seen in Meola, *Masters Series*, 1991.

<sup>356</sup> Don Mock, *Artful Arpeggios*. Milwaukee: Hal Leonard Publishing Corporation, 1977, p. 16.

<sup>357</sup> Mock, *Artful Arpeggios*. 1977, p. 15.

<sup>358</sup> Mock, *Artful Arpeggios*. 1977, p. 18.

Figure 18



When progressing from A major to A diminished in this style of cyclic pattern, the position movement occurs in semitone increments. The incremental position shifts stem from simple tonal alterations to the arpeggios.<sup>359</sup> A major to A minor involves a flattening of the third which, in this case, means the C sharp on the 9<sup>th</sup> fret moves to the C natural on the 8<sup>th</sup> fret. When A minor changes to A diminished the bass note and its octave counterpart both descend a semitone.

The optional bracketed fingering within the A minor arpeggio is relegated to an optional status for a number of reasons, the first of which is its utilization of different finger combinations from its previous arpeggio counterpart. The difficulties that arise through alternating the first and second finger on the same bass note can be problematic.

Introducing this secondary element requires additional coordination, which at this fundamental stage, can divert the developmental focus from sweep-picking motion.

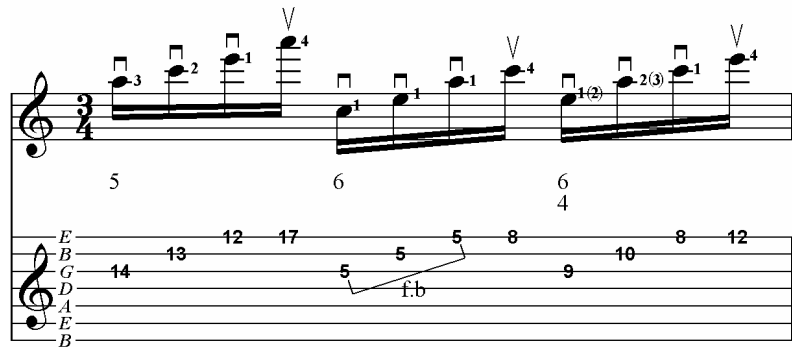
Another reason for this kind of relegation is that in subsequent expansions of this technical idea, the bracketed fingering becomes exceedingly awkward. As mentioned earlier, previous and subsequent notes often influence immediate sweep-picking patterns; at present, however, the bracketed plectrum strokes can be adequately utilized. This form

<sup>359</sup> Observed in Stump, *Arpeggio Lesson Volume 1*, 2003.

lends itself to a plethora of variations based around triadic patterns and their inversions that occur throughout the *Caprices*.

Figure 19 illustrates the different inversions and their positioning on the guitar neck within the key of A minor.

Figure 19



Combining fingering alterations learnt in Figure 18 and the different inversion positions of Figure 19, it is possible to design an exercise that covers each variation. Figure 20 utilizes the three different triadic forms in three respective positions on the fingerboard, along with a number of finger-barrés.

Figure 20

Figure 20 displays three systems of musical notation for triads in C major, C minor, and C diminished. Each system shows the triad in first, second, and third inversions. The notation includes fingerings (1-4) and optional finger barrés (f.b.) indicated by a bracket and the text 'Optional finger barré'.

**System 1:** C major, C minor, C diminished. Fingerings: 5, 3, 5, 3, 5, 3. Optional finger barrés are shown in the C major and C minor triads.

**System 2:** C major, C minor, C diminished. Fingerings: 6, 3, 6, 3, 6, 3. Optional finger barrés are shown in the C major and C minor triads.

**System 3:** C major, C minor, C diminished. Fingerings: 6, 4, 6, 4, 6, 4. Optional finger barrés are shown in the C major and C minor triads.

Individual components and the points of interest will be discussed in the order in which they unfold. The finger-barrés that appear in the root position of the C major chord are optional for future development purposes. As in Figure 18 the natural extension of the arpeggio leads to optional finger-barrés becoming indispensable. The only other place where optional fingering occurs is the C minor arpeggio in its second inversion.<sup>360</sup>

This sweep-picking pattern can be easily moved around the guitar neck, covering the triadic root position, first inversion, or second inversion arpeggios, whilst utilizing the same plectrum pattern.<sup>361</sup>

<sup>360</sup> Observed in Malmsteen, *Masters Series*, 1991. ; Stump, *Arpeggio Lesson Volume 1*, 2003.

<sup>361</sup> *Ibid*

### 5.5.3 Dominant seventh and diminished seventh

Obviously, simple triadic chords are not the only harmony used within the *Caprices*. The dominant seventh and the diminished seventh play a pivotal roll harmonically, especially at modulation and cadential points. Therefore, the ability to apply the previous sweep-picking technique to all altered chords is equally valuable.

From the musical theorist's perspective, the diminished-seventh chord can be described as a dominant ninth without the root note.<sup>362</sup> Figure 21 illustrates how this important harmonic relationship between the two chords can be used in the sweep-picking formula.

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<sup>362</sup> Wikipedia, 'Diminished Seventh', [http://en.wikipedia.org/wiki/Diminished\\_seventh](http://en.wikipedia.org/wiki/Diminished_seventh); accessed 22<sup>nd</sup> May, 2007. ; Dr Tom Pankhurst, 'Short Progressions', <http://www.tonalityguide.com/xxdim7.php>; accessed 22<sup>nd</sup> May, 2007.

Figure 21

Figure 21 displays four musical exercises, each consisting of a treble clef staff and a bass clef staff, illustrating various guitar techniques and chord progressions.

**Exercise 1: Gdom7**

The treble clef staff shows a sequence of notes: G4 (2,3), A4 (3), B4 (1), C5 (4), D5 (1), E5 (3), F#5 (2,3), G5 (3), A5 (1), B5 (4), C6 (1), D6 (3), E6 (2,3), F#6 (3), G6 (1). The notes are grouped into pairs, with fingering indicated by (V) and (M) above the notes. The bass clef staff shows a sequence of notes: E2, B2, G2, D2, A2, E2, B2, G2, D2, A2, E2, B2, G2, D2, A2, E2, B2, G2. The notes are grouped into pairs, with fingering indicated by 12, 10, 13, 10, 12, 12, 12, 10, 13, 10, 12, 12, 10, 13, 10, 12. The exercise includes three "Optional finger barré" markings.

**Exercise 2: Bdim7**

The treble clef staff shows a sequence of notes: B4 (4), C5 (3), D5 (1), E5 (4), F#5 (1), G5 (3), A5 (4), B5 (1), C6 (3), D6 (4), E6 (1), F#6 (3), G6 (4), A6 (1), B6 (3). The notes are grouped into pairs, with fingering indicated by (V) and (M) above the notes. The bass clef staff shows a sequence of notes: 16, 15, 13, 16, 13, 15, 16, 15, 13, 16, 13, 15, 16, 15, 13, 16, 13, 15.

**Exercise 3: Dmin7**

The treble clef staff shows a sequence of notes: D4 (3), E4 (2), F#4 (1), G4 (4), A4 (1), B4 (2), C5 (3), D5 (2), E5 (1), F#5 (4), G5 (1), A5 (2), B5 (3), C6 (2), D6 (1), E6 (4), F#6 (1), G6 (2). The notes are grouped into pairs, with fingering indicated by (V) and (M) above the notes. The bass clef staff shows a sequence of notes: 7, 6, 5, 8, 5, 6, 7, 6, 5, 8, 5, 6, 7, 6, 5, 8, 5, 6.

**Exercise 4: Cmaj7**

The treble clef staff shows a sequence of notes: C4 (2,3), D4 (3), E4 (1), F#4 (4), G4 (1), A4 (3), B4 (2,3), C5 (3), D5 (1), E5 (4), F#5 (1), G5 (3), A5 (4), B5 (1), C6 (3), D6 (4), E6 (1), F#6 (3), G6 (4). The notes are grouped into pairs, with fingering indicated by (V) and (M) above the notes. The bass clef staff shows a sequence of notes: 5, 5, 3, 7, 3, 5, 5, 5, 3, 7, 3, 5, 5, 5, 3, 7, 3, 5. The exercise includes three "Optional finger barré" markings.

As well as the all-important dominant seventh and diminished seventh chords, Figure 21 utilizes major and minor seventh arpeggios. On examination, both the C maj7<sup>th</sup> and G dom7<sup>th</sup> fingering technique bear a striking resemblance to one another as do the B dim7<sup>th</sup>



and the D min7<sup>th</sup>. This commonality gives the guitarist the ability to choose the most economic fingering technique when approaching these kinds of arpeggios.

#### 5.5.4 Three-string sweep-picking summary

It is superfluous to illustrate the plethora of altered chords and their resulting inversions that can be adapted to fit this single sweep-picking pattern. Suffice to say, it can be adapted with relative ease to serve almost any altered chord and its inversions.

Throughout the *Caprices* the three-string sweep-picking pattern has been utilized in a variety of musical contexts and therefore must be mastered prior to practical application.

#### 5.5.5 Five, six and seven-string sweep-picking

The natural evolution of this technique is its expansion onto more sets of strings, a typical example of which is illustrated in Figure 22.<sup>363</sup> This D major arpeggio epitomizes the simplicity of sweep-picking, whilst exemplifying in form and technique an arpeggio typical to the *Caprices*.

Figure 22

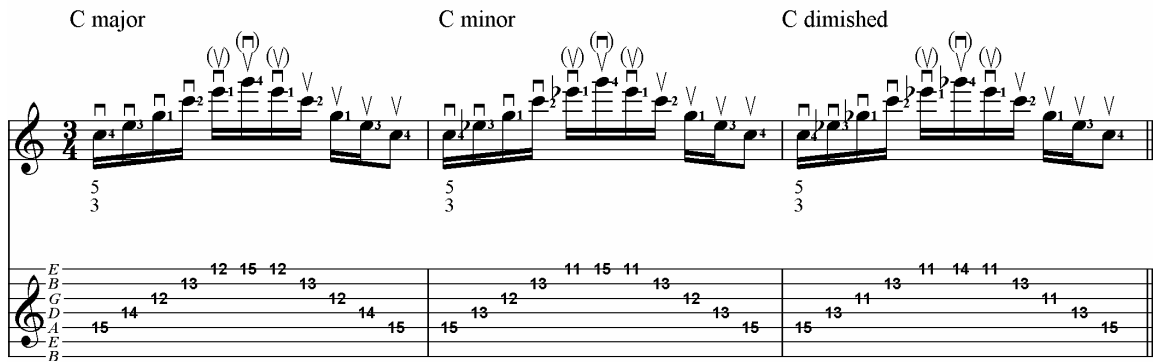
‘Caprice No. 16’, bar 8



<sup>363</sup> Moore, *Advanced Lead Guitar Techniques*, 1987.

The fundamental technique exhibited in Figure 22 can be expanded on. Figure 23 is a realization of that expansion, covering the major, minor and diminished chords in root position.<sup>364</sup>

Figure 23



A number of problematic issues arise with the addition of more strings into the sweep-picking equation. One of the foremost problems that can become a fundamental technical flaw is the rushing of the sweep component of the arpeggio.<sup>365</sup> This needs to be kept in check to prevent note duration, string tone and timing from being impaired on longer sweeps.<sup>366</sup>

### 5.5.6 Combining sweep-picking and alternate-picking

Very seldom does sweep-picking occur in total technical isolation; therefore, the facilitation of an alternate-picking component becomes imperative for its natural expansion. However, the problems of continuity (both physically and musically) when switching between the two techniques, as in the case of Figure 23, is concerning. The key component is to position the right hand correctly at the end of the sweep so as to be in the optimum position.<sup>367</sup> Although highly subjective, the optimum position can be

<sup>364</sup> Moore, *Advanced Lead Guitar Techniques*, 1987.

<sup>365</sup> Gambale, *Monster Licks and Speed Picking*, 1988. ; Gilbert, *Intense Rock*, 1988.

<sup>366</sup> Gilbert, *Intense Rock*, 1988.

<sup>367</sup> Observed in Gilbert, *Intense Rock*, 1988. ; Becker, *The Legendary Guitar of Jason Becker*, 2007.

most accurately defined as that in which the correct plectrum angle can be attained relative to the string. Unobstructed access to the optimal position for the individual can only be gauged through long practice and extensive experimentation with string tone.

Musical conditions can dictate that the optimum right hand position is deliberately subverted in favour of string tone and dampening. An example of this which occurs regularly is pushing the plectrum hand past its optimal position, in order to facilitate a more heavily dampened percussive string tone. There are also other occasions where stopping short of the optimal plectrum position relative to the string angle occurs, forcing the wrist to twist in order to reach the remaining notes. This can happen for a variety of reasons, a common one being the proximity of notes of extreme range to the main melody. Notes at the upper or lower extremities of a melody can sometimes be reached most economically by twisting the wrist rather than by hand relocation.<sup>368</sup> This technique is more difficult, as it requires a reorientation of the plectrum angle by the fingers in conjunction with the twisting wrist, to retain plectrum angle consistency. Another issue that arises when utilizing this technique is the problem of controlling string tone and dynamics with the palm out of position. When the note in question is in the upper register, string tone to a degree can be controlled utilizing the fourth or third fingers of the right hand.<sup>369</sup> Conversely, when the note is below the main melody, part of the thumb or the palm directly below the thumb can be used.

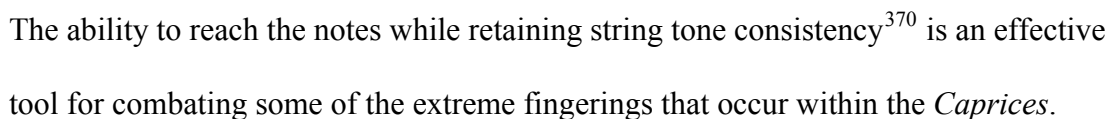
Figure 24 is an extract that encompasses the aspects discussed above relating to notes with extreme range differences within the *Caprices*.

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<sup>368</sup> Observed in Gilbert, *Guitar Techniques*, 2006. ; Gilbert, *100% Racer X*, 2001.

<sup>369</sup> Meola, *Masters Series*, 1991.

‘Caprice No. 16’, bar 50



The *Caprices* utilize many five-string arpeggios, most of which can be broken down into the following fingerings and sweep-picking techniques. Figure 25, illustrates the second main fingering for five-string arpeggios in root position.<sup>371</sup>

C major                      C minor                      C diminished

5  
3

E  
B  
G  
D  
A  
E  
B

15 19 17 17 17 15 20 15 17 17 17 19 15 18 17 17 16 15 20 15 16 17 16 14 20 14 16 17 16 18

f.b f.b f.b

<sup>371</sup> Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

There are two methods of fingering five-string arpeggios in root position, the first indicated in Figure 23.<sup>372</sup> In this example, all the notes fingered are below the first note on the headstock side of the fingerboard; consequently, they all begin with the fourth finger. However, Figure 25 demonstrates the extra range that can be achieved by playing all the notes in the arpeggio above the initial note.<sup>373</sup>

Conspicuous by their absence in Figure 23, finger-barrés are a necessity to reduce plectrum movement where the reordering of notes creates consecutive string motion.<sup>374</sup> Although optional in the C major chord, the finger-barré can be executed with either the second or third finger, as opposed to the C minor chord, where the given fingering is the most viable option.

The success of this type of sweep-picking is dependent on the correct execution of the alternate-picking component. This occurs on the initial and final stroke of each arpeggio and the high E string. Whilst invariably opposed in direction to that of the remaining notes, the alternate-picking stroke promotes economical plectrum motion. However, the alteration of the initial stroke<sup>375</sup> must be balanced at the other end of the arpeggio in order to promote a seamless flow from one triadic figure to another.<sup>376</sup>

The balancing of the equation leaves the three-note-per-string alternate-picking section on both the top and bottom of the arpeggios. Although, this could be made more efficient

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<sup>372</sup> Moore, *Advanced Lead Guitar Techniques*, 1987.

<sup>373</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>374</sup> *Ibid*

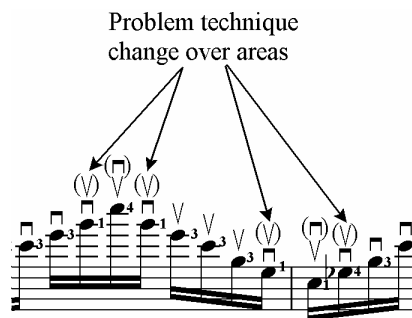
<sup>375</sup> *Ibid*

<sup>376</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

by using an even number of notes at the turn around point,<sup>377</sup> the three notes at the top of the triadic figure more successfully mimic the arpeggios used with the *Caprices*. It is at these points that note duration and string tone can alter which is often symptomatic of a larger technical problem; the inability to change fluidly and instantaneously between techniques making the actual shift aurally imperceptible. There are four points of concern in Figure 25:

1. The beginning of the alternate-picking section at the top of the arpeggio
2. The beginning of the downward sweep
3. The beginning of the alternate-picking section at the bottom of the arpeggio
4. The beginning of the ascending sweep-picking motion

Figure 25



To a degree, the plectrum hand is susceptible to incorrect positioning at these changeover points. However, the problem can arise from a combination of incorrect plectrum angle and hand positioning, which is easily rectified with increased vigilance at these points. The arpeggio turn-around figure, illustrated here in Figure 26, appears throughout the *Caprices*.

<sup>377</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

Figure 26

‘Caprice No. 24’, bar 153-154

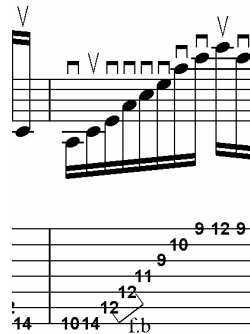
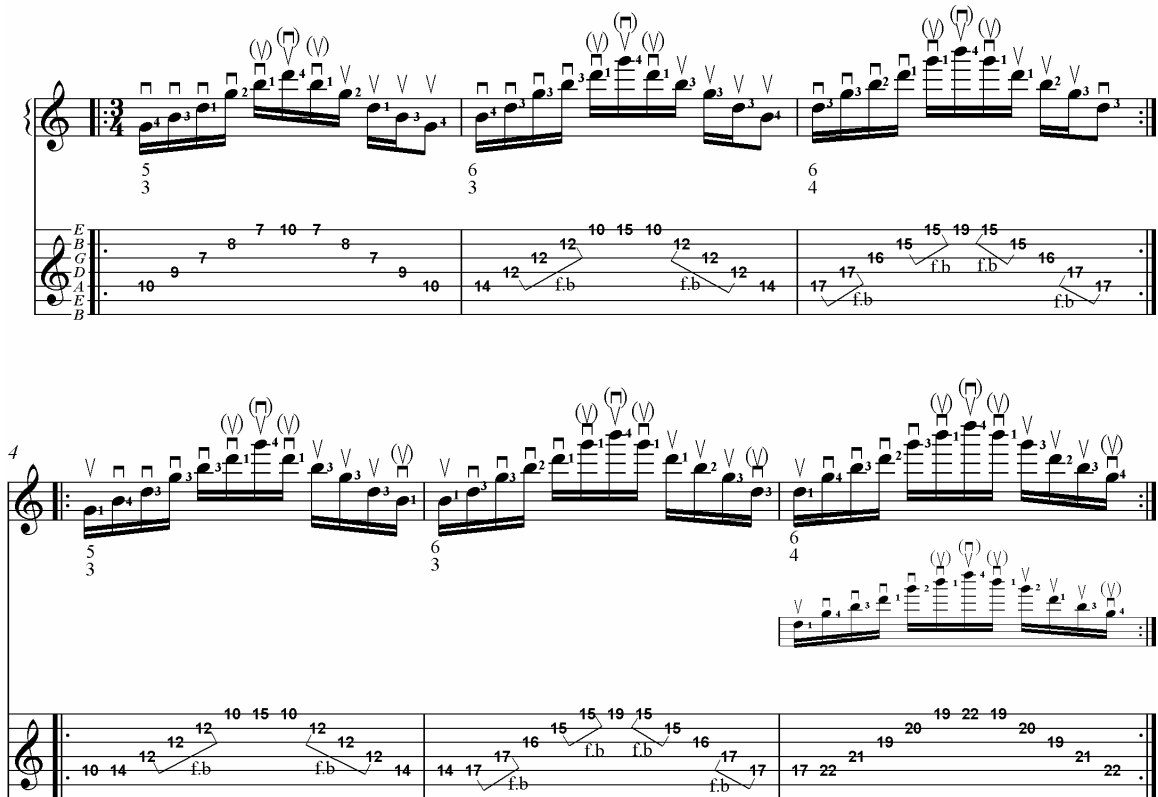


Figure 27 illustrates a G major chord and its principal inversions utilizing the two different sweep-picking patterns discussed.

Figure 27



There are a number of points of interest within this exercise that require further explanation. The first occurs within the first two notes of bar 5, utilizing the third finger for the finger-barré rather than the more obvious fourth finger. The motivation behind

this decision is similar in nature to the optional finger-barré of Figure 20 which is based on the subsequent technical expansion.

Also requiring explanation is the fingering options of bar 6, with the *ossia* staff offered as an alternative for the confined fret area on that part of the fingerboard. Due to the close proximity of the frets in that area of the fingerboard, the alternative fingering may be more useful for people with longer fingers.

#### **5.5.7 Five-string arpeggios summary**

The five-string sweep-picking arpeggio is the intermediary step between larger hand movements and the smaller three-string sweep-picking technique. The ability to move the hand accurately across a large numbers of strings, whilst incorporating alternate-picking where required, is essential if further technical facility is to evolve. This technical requirement is fundamental to successfully tackling the least demanding static position five-string arpeggios that occur within the *Caprices*.

The kind of plectrum patterns that are shown in Figures 25 and 27, are indicative of the sweep-picking patterns found throughout the transcriptions. Technical combinations, turnaround techniques and their corresponding issues have been covered, in addition to the basic five-string triadic shapes and their inversions. This being the case, transposition on to different groupings of strings should be relatively straightforward, paving the way for a further expansion into six and seven-string sweep-picking.



### 5.5.8 Six and seven-string arpeggios

In order for this technique to evolve whilst remaining within the confines of a static position, the lower two strings must be added. Figure 28 and 29 illustrate two examples of six and seven-string static position arpeggios found within the *Caprices*.

Figure 28

‘Caprice No. 24’, bar 148

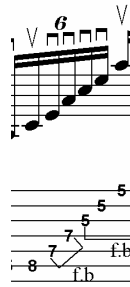


Figure 29

‘Caprice No. 24’, bar 153

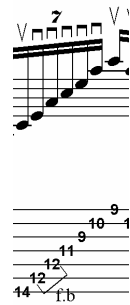
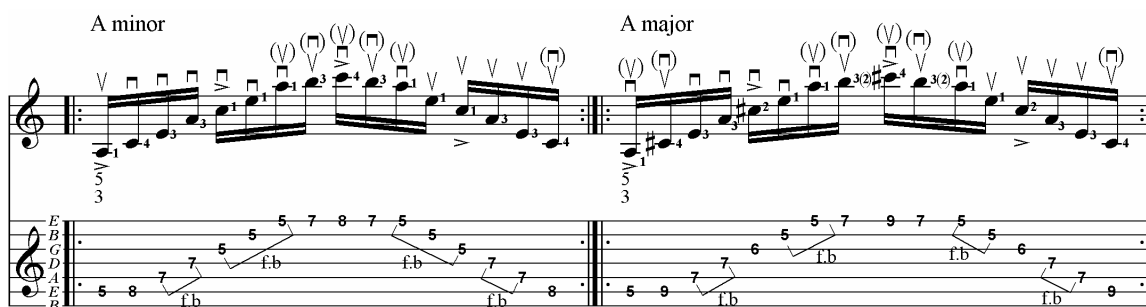


Figure 30 retains the established norms, being an alternate-picking component on both the highest and lowest strings, with the remainder between the turnaround points consisting of sweep-picking.

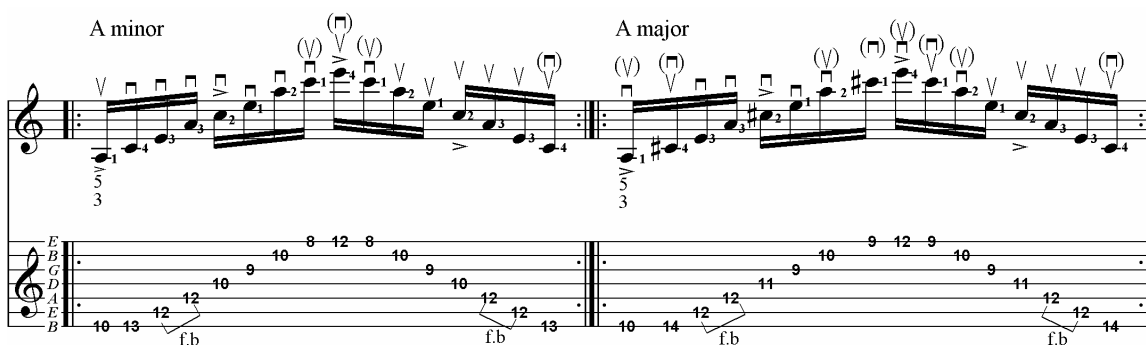
Figure 30



The addition of a major 9<sup>th</sup> note (B natural) and the accents are solely to aid in the retention of a solid tempo throughout, something commonly overlooked with longer sweeps.<sup>378</sup> Although the accents occur on every beat of the bar, only beats one and three are defined accents, with beats two and four being implied accents.

Unlike Figure 30, which outlines a standard minor/major barré-chord shape, Figure 31 can be viewed as a singular shape or as two parts, each of which employ different arpeggio patterns.<sup>379</sup>

Figure 31



However, due to the seven-string range of the arpeggio, the fingering is different, although the actual notes on both parts are the same. The first three notes are a derivative technique explored in Figure 30 whilst the remainder is indicative of Figure 23.

<sup>378</sup> Gilbert, *Intense Rock*, 1988.

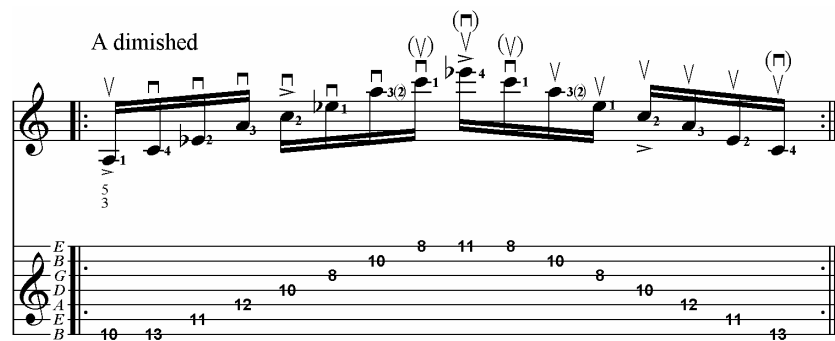
<sup>379</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

Still classed as a static position arpeggio, the altered fingering necessitates a subtle pivoting motion in order to retain the correct fingering position relative to the strings.<sup>380</sup> Although this movement is required by the thumb, its actual placement on the neck should remain unchanged.

Figure 31 utilizes exactly the same finger usage with subtle stretching alterations to accommodate the change from the minor to major third. These shapes appear in root position whilst utilizing the same fingering, making them both easier to learn and remember as well as being transferable to any position on the neck.

Figure 23 illustrates how a diminished triad in root position can be inserted into this plectrum formula whilst still retaining the same plectrum turnaround points and sweeps.

Figure 32



Although similar to Figure 31, a slightly more extreme pivoting motion on the thumb in the left hand is required, this being largely due to the two whole tones between frets 12 and 8. In this case optional fingering is provided, to both simplify and retain a consistent spacing between the 10<sup>th</sup> and the 8<sup>th</sup> fret.

<sup>380</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

In many places throughout the *Caprices*, altered chords play an equally important role, especially in single-note melody. Therefore, the ability to manipulate the technique of sweep-picking in order to play these altered harmonies must be addressed. Figure 33 illustrates how in the first two bars the same plectrum pattern in Figure 32 can be employed, then in the second two bars how the order of notes can be altered.

Figure 33

In the first two bars, the addition of the 11<sup>th</sup> note to both the minor and major seven-string sweeps is made more striking by its placement at the highest point of the arpeggio. Being positioned at both the middle and highest point allows the first three notes of the arpeggio to establish the triadic harmony, without itself being altered.

In the first two bars, the 11<sup>th</sup> note replaces the third in the middle and upper octave of the arpeggio; in the second two bars, however, it appears in addition to the third.

This being the case, a natural evolution of the plectrum technique is required in order to fit all the notes into the established static arpeggio framework, illustrated here in Figure 34.

Figure 34



The consequence of this extra note adds an alternate-picking component to the sweep-picking strokes which in turn has two slightly different approaches. A valid argument can be made that the optional plectrum strokes are the more efficient, mirroring in motion the first two notes of the arpeggio. The given plectrum strokes create the longer sweep with the slightly more difficult movement of striking the D note with an upstroke, lifting the plectrum over the D note and continuing on with the sweep.

An alternative bracketed fingering option can be used to prevent the wrist from twisting out of position on the larger stretches, between the D and the E note with the third and first finger.<sup>381</sup> For guitar players with smaller hands the stretch can be more difficult, which in turn can force the wrist out of position.<sup>382</sup> Therefore, using the fourth instead of the third finger on the D note can make the gap more manageable. The relevance of this becomes more apparent the further down the neck the arpeggio pattern travels.

Figure 35 illustrates how, by manipulating the plectrum technique, it is possible to include diatonic non-triadic notes from the tetrachord, giving a jazz style harmonic ambiguity to the arpeggio.<sup>383</sup> Subtle colouring can be created, by placing the seventh

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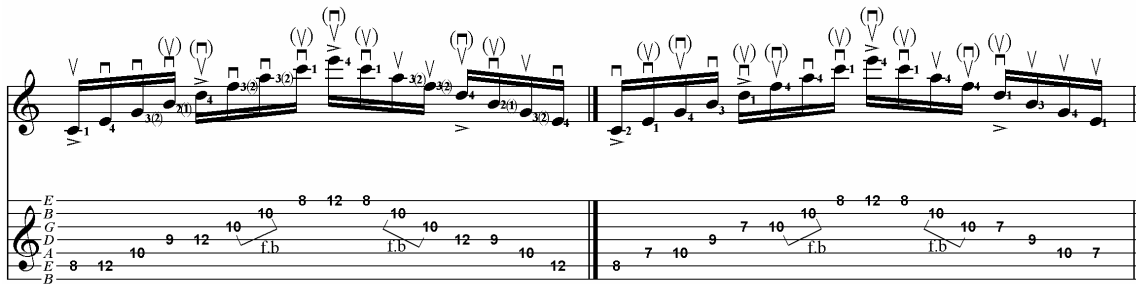
<sup>381</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>382</sup> *Ibid*

<sup>383</sup> *Ibid*

note in the middle of the arpeggio, flanked by strong triadic harmony in the lower and upper octaves. As sweep-picking speed increases, the notes on the upper and lower extremes become more aurally apparent, making the positioning of non-triadic notes relevant.

Figure 35



The alternative fingering in this exercise can aid the hand in avoiding any twisting which can occur during this type of exercise. When playing the finger-barré with the second finger this issue manifests itself more commonly in guitarists with a smaller finger spread.<sup>384</sup>

Figure 35 consists of two different styles of plectrum pattern, both of which exhibit similarities in the positioning of the alternate-picking component. The plectrum technique in bar 1 is reminiscent of bars 3 & 4 of Figure 33, whilst the second bar differs from the established norm by means of a single note on the E string.

The relevance of fitting this style of arpeggio into the already established plectrum patterns, gives the guitarist the ability to target any non-harmonic melody notes, within a static position during sweep-picking. Technical modification then requires nominal

<sup>384</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

effort to target chromatically-altered harmony notes, chromatic passing notes and groupings of non-diatonic harmony notes.

The key factor in reaching these non-triadic and non-diatonic harmony notes is the position of the alternate-picking component. In the first bar, the alternate-picking component is positioned on the E, D and high E string, whilst in bar 2 it occurs on the A, G and high E string. It is the range of harmonic alterations that can be reached using the same plectrum pattern, that make this technique valuable.

Figure 36, extracted from the above example, shows how it is possible to reach the seventh, octave, major ninth, minor ninth and even the ability to reiterate the third by stretching the fourth finger up to the 14<sup>th</sup> fret. All these alteration can be achieved using the same picking pattern.

Figure 36



Figure 37 is an example extracted from the *Caprices*, illustrating how this takes place in a real musical context.

Figure 37

‘Caprice No. 11’, bar 63

The image displays a musical score for a plectrum piece, specifically 'Caprice No. 11', bar 63. It is divided into four sections: 'Original extract', 'A min7', 'Modulatory passage', and 'New tonic'. Each section shows a plectrum line (treble clef) and a corresponding guitar fretboard diagram (bottom staff). The plectrum line uses a 2/4 time signature and features a series of eighth notes with various accidentals. The fretboard diagrams show the corresponding fret numbers for each note, with some notes marked with a '10' indicating a natural harmonic or a specific fretting technique. The 'Original extract' shows a complex sequence of notes with many flats. The 'A min7' section shows a simplified version of the passage, focusing on the A minor seventh chord. The 'Modulatory passage' shows a chromatic alteration of the harmony. The 'New tonic' section shows the final chord, which is a new tonic for the key.

With a few alterations to notes and fingerings, it is possible to access alternate harmonic directions, without affecting the plectrum technique. The second bar demonstrates how, by canceling both the E flat and G flat, it is possible to convert the same passage into an A minor seventh chord.

The final two bars demonstrate how by chromatically altering the harmony whilst retaining the plectrum motion, it is possible to shift the harmonic centre thus facilitating modulation. By flattening any note of a diminished-seventh chord, that note then becomes the root of the dominant chord of the new key, in this case E. This simple modulation technique, in addition to basic chromatic alterations, widens the scope of keys to which one can move. Although rhythmically inappropriate, the examples exemplify the benefit of developing the ability to access other notes outside the arpeggio without changing the plectrum motion.

Although only a few examples of altered chord shapes have been explored from a technical perspective, they have rendered the technical repertoire required. Although, a



plethora of other altered chord shapes exist, their performance can be treated as an adaptation or natural evolution of the now evolved sweep-picking technique.

#### **5.5.9 Static position arpeggio summary**

Utilizing the given exercises in their entirety or in part reveals the tools needed to deal with the static position arpeggios that appear within the *Caprices*. However, during the course of this part of the chapter, a number of interesting technical issues regarding choice have arisen.

Throughout this section, the concept of previous or subsequent arpeggios or groupings of notes which influence immediate plectrum strokes has become more apparent. This musical imperative, echoed throughout the transcriptions of the *Caprices*, is reflected in the exercises. How, where and why plectrum motion is altered is also a major theme throughout and one that continues in the subsequent chapters. Many of the technical solutions are subjective in nature, necessitating alternative plectrum strokes and fingering where practical.

With the addition of alternate-picking components, another variable was added to the technical solution expanding the scope of choices offered. However, its addition emphasizes the symbiotic relationship between the two plectrum methods in practical playing contexts. Through alternate-picking, the access of chromatically altered non-harmony notes widens the range compass of harmonic possibilities while retaining a practical sweep-picking framework.

## 5.6 Linear motion

### 5.6.1 Introduction

In order for the technique to further develop, it is necessary to widen the scope of sweep-picking arpeggios to include linear motion. It is important to outline the reasons why linear motion would be more suitable than a static position arpeggio.

### 5.6.2 Incremental motion

Using linear motion on the guitar neck gives the guitarist the ability to move incrementally either up or down the neck in order to cover the musical range.

Incremental movement can be more practical physically by eliminating large leaps, reducing the danger of excess string noise or poor string tone and incorrect note duration.<sup>385</sup>

Figure 38 shows two different solutions for the same arpeggio position, demonstrating how, in this case, incremental motion can alleviate large leaps by the fingerboard hand. By moving in a gradual linear fashion across the fingerboard, the new target area is attained by the first finger moving from the 10<sup>th</sup> fret to the 12<sup>th</sup> fret, a relatively small distance.<sup>386</sup> This is in contrast to the static position arpeggio that requires the first finger to move from the 5<sup>th</sup> to the 12<sup>th</sup> fret, which at relatively faster speeds is impractical. By alleviating large leaps in the left hand, tension in the melody can be minimized, resulting in a much more fluid sequence of notes.

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<sup>385</sup> Observed in Stump, *Arpeggio Lesson Volume 1*, 2003.

<sup>386</sup> Observed in Meola, *Masters Series*, 1991.

Figure 38

The image displays a musical score for a string instrument, comparing two arpeggiated passages. The top staff is in treble clef, and the bottom staff is in bass clef. The first section, labeled 'Static position', shows a sequence of arpeggios where the string tone changes abruptly from one note to the next. The second section, labeled 'Incremental motion', shows a similar sequence but with a more gradual change in string tone. Both sections include 'Left hand shift' annotations with arrows pointing to specific notes. The bottom staff contains fingering numbers (1-5) and fret numbers (5, 8, 7, 5, 8, 12, 15, 13, 12) for the left hand, along with a 'f.b.' (fret bend) marking.

Another major difference between static position and incremental motion is the degree that the string tone changes.<sup>387</sup> In the above example, the static position arpeggio cycles through many strings, usually one per note. This can change the string tone abruptly from one colouring to another. In the incremental motion, string tone alters in a more uniform and less rushed manner, delivering an altogether smoother-sounding arpeggio. The abrupt tone changes or lack thereof can be used either to draw attention to a certain passage, or in the case of incremental motion, can assist the passage to sit more inconspicuously in the overall phrase.

By its very nature, incremental motion often uses the same kinds of fingering patterns between groupings of strings, making it extremely easy to learn arpeggios with an increased range. The downside however, is the need of the player to memorize more complicated sweep-picking plectrum patterns, as in the above example.

### 5.6.3 Symmetrical motion

Figure 39 demonstrates how the principle of linear motion can be expanded to include the three main diatonic triads, in three different fingering shapes.<sup>388</sup>

<sup>387</sup> Observed in Malmsteen, *Masters Series*, 1991.

<sup>388</sup> Stump, *Arpeggio Lesson Volume 1*, 2003.

Figure 39

Figure 39 displays three musical examples, each consisting of a treble clef staff with a 3/4 time signature and a corresponding bass line staff. The examples are labeled 'A minor', 'A major', and 'A diminished'.

- A minor:** The treble staff shows a sequence of notes with fingerings (1, 2, 3, 4) and left hand shifts indicated by arrows. The bass line shows fret numbers (5, 7, 9, 10, 8, 12) and a final fret number of 12.
- A major:** The treble staff shows a sequence of notes with fingerings (1, 2, 3, 4) and left hand shifts indicated by arrows. The bass line shows fret numbers (5, 7, 9, 10, 9, 12) and a final fret number of 12.
- A diminished:** The treble staff shows a sequence of notes with fingerings (1, 2, 3, 4) and left hand shifts indicated by arrows. The bass line shows fret numbers (5, 7, 8, 10, 8, 11) and a final fret number of 11.

Cursory examination reveals the similarities between the three triadic figures; all are based upon a similar spectrum and note pattern. An important part of incremental motion is the actual physical movement required by the left hand.

As these triads are all in root position, it is the correct positioning of the root of the chord that will determine the success of the position shift. The remaining fingers are placed relative to the root, in this case, the second, first and fourth fingers respectively.

The incremental movement between positions is a major second or minor third, obviously the smaller the gap covered by the left hand the more time can be allowed for the

movement. The position shift requires more time and preparation than a normal static position arpeggio. The new position must be attained before the next note is sounded, without the notes prior and subsequent to the shift being disadvantaged in any way. However, this is no different to a normal position shift on the guitar, which requires timing and coordination to be executed correctly. This raises the issue of where the position shifts should be placed?

#### 5.6.4 Asymmetrical overlapping movement

In Figure 39 the shifts are positioned symmetrically, however, it is often prudent to shift positions on different notes. Where the incremental position shift takes place is highly subjective, being dependent on many variables. There are various reasons to shift position ranging from the presence of a simple opportunistic pause in the music to the plectrum stroke being in the optimum position to facilitate that motion. Figure 40, illustrates how incremental motion can occur independently of plectrum strokes with the exercise using an unchanging plectrum pattern. In addition, it shows a number of diverse methods of approaching position shifts with various fingerings on the same arpeggio.

Figure 40

Figure 40 is a musical score for an exercise in A minor, consisting of three measures. The top staff is a treble clef with a 3/4 time signature. The bottom staff is a bass clef. The exercise consists of arpeggiated chords. The first measure shows a shift from the 5th to the 3rd position. The second measure shows a shift from the 3rd to the 1st position. The third measure shows a shift from the 1st to the 5th position. The shifts are indicated by vertical lines labeled "Left hand shift". The bottom staff shows the fret numbers for each note: 5, 3, 7, 7, 5, 9, 10, 8, 12. The first measure has a "5 3" label under the first two notes. The second measure has a "3 1" label under the first two notes. The third measure has a "3 1" label under the first two notes. The bottom staff also has a "5 3" label under the first two notes. The exercise is in A minor, as indicated by the key signature.

Although plectrum strokes do not often affect position shifts, position shifts can dictate fingering choice. This being the case, the distance that the left hand needs to travel up

the guitar neck to change position whilst retaining an optimal fingering position, can vary dependent on finger choice. For example, in the first bar, the second position shift is executed by moving the first finger from the 5th to the 9th fret, requiring substantial movement. In bar 2 the first position shift requires the first finger to be moved a second, which is an octave above the previous note and a relatively small movement.

The derivative nature of Figure 41 shifts the scope of incremental motion from technical theory into the realms of a practical playing context.

By extracting the main melodic patterns of ‘Caprice No. 5’ in their original positions, it is possible to manipulate the fingering to create small movements towards the second octave at the 12<sup>th</sup> fret. Through a gradual transition, the first finger acts as a motion catalyst, with its movements shown in the *ossia* staff. This type of opportunistic

manipulation of fingerings can help reach a new area on the finger-board, as in this case the 12<sup>th</sup> fret.

By moving in this fashion, a more gradual string tone change can be cultivated as the strings get shorter, creating a higher string tension. This eliminates the abrupt timbral change, which is often associated with an instantaneous position shift of this size. Palm-dampening can also go through a more gradual transition as the positions change, enhancing the overall smooth feel of notes in the first two bars.

However, because of the change between round wound and flat steel strings, the transitional stage between the second and third bar can be more abrupt. This being said, relaxing the grip on the plectrum and allowing it to be more passive when striking the strings, can help to a certain extent.

The alternate-picking and sweep-picking combinations are difficult to master throughout the *Caprices* with no discernible pattern to their use. Wherever possible, sweep-picking has been employed to optimize picking motion. The disadvantage of this approach is a more practical but less uniform plectrum flow.<sup>389</sup>

Before expanding on the theme of position shifts in conjunction with sweep-picking, it is necessary to place the idea into a technical context.

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<sup>389</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989. ; Romeo, *The Guitar Chapter*, 2000.

Figure 42

‘Caprice No. 5’ bars 13-14

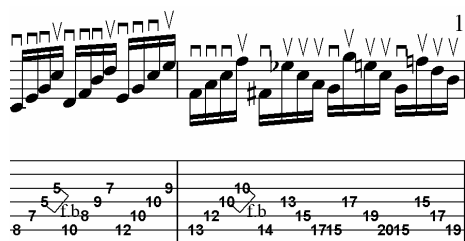


Figure 42, not only illustrates where it has been used, but to what extent the development must reach in order to be musically usable within the *Caprices*.

### 5.6.5 Alternate transitional fingers

There are a number of techniques that are brought into focus requiring a certain style of exercise that targets these specific individual aspects. In contrast to Figure 41 where the position shifts revolve around the relocation of the first finger, Figure 43 illustrates how the other three fingers can also be used.

Figure 43

Within any one overlapping position shift, there are usually a number of transitional points where the left hand can change position; these can vary in degree of difficulty.

The defining factor in establishing the degree of difficulty in any position shift is mainly



dependent on the relocation of the transitional finger. The transitional finger can be described as the finger that frets the first note of any phrase in its new position. The relative positioning of other fingers is dependent on this finger attaining correct placement.

Seen here is the main transition and alternative transition points, the alternatives are marked with bracketed fingering. It can be argued that the main transition can be approached with a slide, as the first note of the new position is fretted with the same finger as the last note of the previous position. However, each note should sound independently making no discernible sliding or fret noise between pitches.

The overlapping nature of these position shifts provides an alternative transitional area whose difficulty revolves around the need for two simultaneous actions; the sliding motion<sup>390</sup> and the reshuffling of the fingers. Both of these motions must occur whilst the left hand is moving to its new position.<sup>391</sup> As the transitional finger toggles between two and three in the first two position shifts, the added variable can initially create coordination difficulties. These coordination issues can sometimes be resolved by utilizing a combination of both transitions. In turn, this expands both the flexibility and diversity of options that can be customized according to personal preference.

Irrespective of which transitional finger is used, the sweep-picking pattern remains constant with only one alternative plectrum stroke required. The arrangement of four

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<sup>390</sup> Greg Howe, *Hot Rock Licks*, Seattle: R.E.H. Publications Inc., 1989.

<sup>391</sup> Observed in Howe, *Hot Rock Licks*, 1989.

notes on the high E string eliminates any convoluted plectrum choice, allowing the focus to be firmly on position shifts.

### 5.6.6 Multiple transitions

In order to increase the range of options available to the guitarist, the ratio of notes per position shift needs to decrease. In order to stay within the plectrum framework established in Figure 43, additional position shifts on the lower extremities need to be employed as in Figure 44.

Figure 44

Figure 44 displays musical notation for guitar transitions, categorized into 'Main transitions' and 'Alternative transitions'. Each section includes a musical staff with notes and a corresponding line of fingerings (1-4). The 'Main transitions' section includes a 'Transitional double-up' for option B. The 'Alternative transitions' section includes options A, B, and C. At the bottom, there is a fretboard diagram showing the positions of the notes on the strings.

From the protocol developed in Figure 43, a letter has been assigned to both the main and the alternative transitions. This refers to the difficulty factor; A being the easier and C the more difficult. Symmetrical plectrum motion makes the main transitions relatively unproblematic, with B presenting the option of one position shift. This economical motion is achieved by remaining in one position for double the length of time. However, the resulting fingering utilizes larger stretches and a more intricate finger pattern.

Although the numbered bracket shows clearly the transition points, in reality, many of the alternatives move in a more gradual motion. A good example occurs between the first and second positions in A of the alternative transitions, where the fourth and first exchange positions. At this point the proximity of the two fingers is only one fret apart, moving from the eighth to the seventh fret. However, the hand opens out in a concertina motion in order to reach the D with the fourth finger. In reality this provides a more gradual transition than is implied by the notation. By developing this style of contraction or expansion of the fingering, the guitarist has the ability to smooth position movement, making it less acute and inaudible.

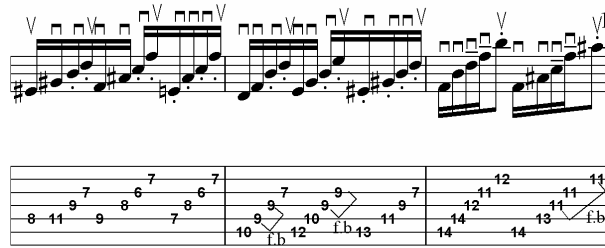
Unlike the other transitions, the B alternative employs five different movements utilizing a slightly different approach. By using the first finger as the transitional finger between the second and third positions, the first finger moves in the opposite direction to the rest of the exercise. By expanding the finger spacing, it is possible to utilize this opposite motion to make an otherwise large transition easier.

Figure 44 illustrates that in reality a position shift can occur at any given time, some, however, being more suitable and less audible musically than others. Although less uniform with more intricate fingerings than the main transitions, exploration and development of the alternatives reveals a number of unique solutions.

In order to contextualize and expand upon the current technical line of investigation, musical examples displaying a derivative nature can be utilized. Figure 45 exhibits typical linear motion for an arpeggio, from which the raw material can be used to design a number of related musical exercises.

Figure 45

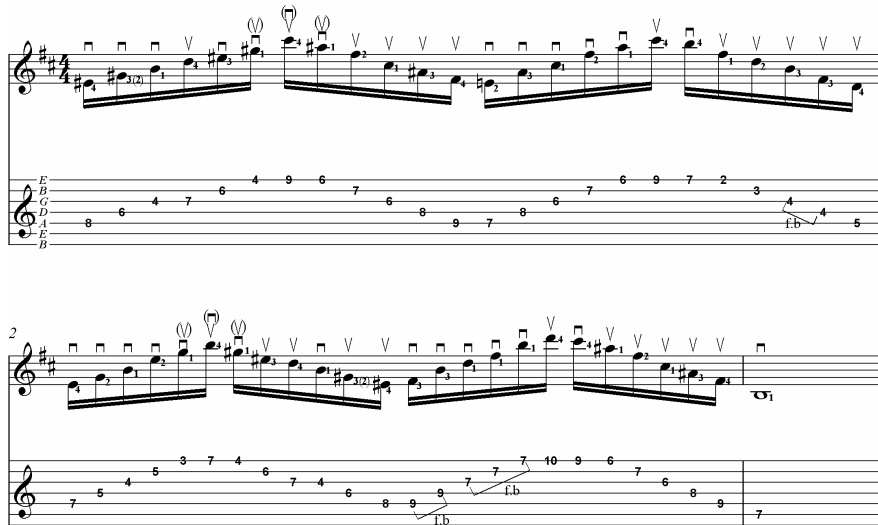
‘Caprice No. 20’, bars 50-52



Extracting the harmonic content and essence from the aforementioned exercise, renders the material required to expand the range whilst retaining the cadential characteristics.

Figure 46, utilizes identical inversions with uniform sweep-picking and transitional motion. The latter incorporates an alternating E string transition from three to four notes.

Figure 46



Although keeping within the concept of linear motion and sweep-picking, the prolongation of the harmonic rhythm through E sharp diminished 7<sup>th</sup>, F sharp major, F sharp major with E natural in bass, B minor first inversion, E minor, E sharp diminished, B minor second inversion, F sharp major, focuses on continuously changing alternate-picking patterns at transition points. It does this whilst expanding sweep-picking to

encompass more strings. At these points, alternate-picking cycles from three-two to four-two, repeat themselves over a consistent positional movement and rhythmic pattern.

In conjunction, the bass note introduces linear movement in both directions on the neck, as opposed to one continuous direction which has previously been the case. This continually changing sweep-picking theme is echoed in the different combinations of transitional fingers, an aspect that more closely resembles practical caprice fingerings.

### 5.6.7 Nonoverlapping linear motion

Thus far, the scope of development has been focused on position shifts with overlapping components, with both positions having frets in common. However as Figure 47 illustrates, it is both practical and necessary to be able to move between positions that have little or no common frets.

Figure 47

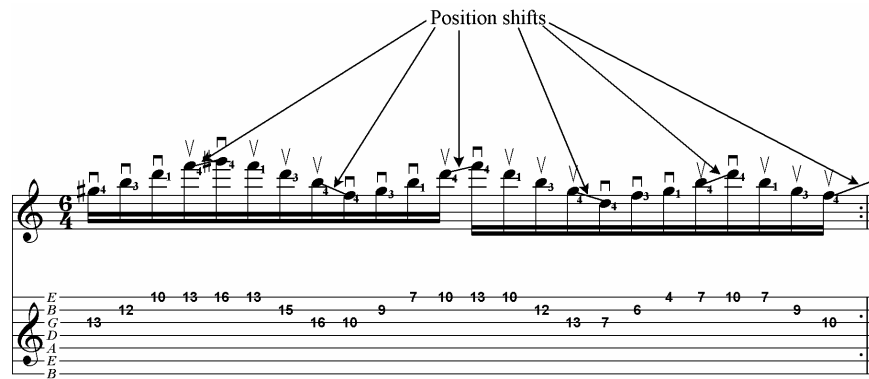
‘Caprice No. 20’, bars 27-28



An arpeggio that provides an unobstructed focus on non-overlapping position shifts is the diminished seventh chord.<sup>392</sup> Figure 48 illustrates the uniformity in fingering, position movement, transitional fingers and plectrum motion, which the diminished seventh provides. This allows an uninterrupted focus on the larger position movements.

<sup>392</sup> Marshall, *Yngwie Malmsteen's Style*, 1986.

Figure 48



Due to the tonal ambiguity of the diminished seventh chord and the tuning of the electric guitar, the chord appears in exactly the same shape irrespective of which note is the root. This uniformity is mirrored in position shifts, with the even plectrum stroke denomination at transition points providing smooth, economical plectrum motion.

Notes subsequent to position shifts, regardless of transitional fingerings, are situated relative to the first finger. Consequently, all notes are played in front of this finger. However, the fourth finger assumes both the anchor and transitional finger role, dictating relative subsequent fingerings and creating potential areas of concern.

Becoming accustomed to using the fourth finger to change positions down the neck can be awkward as it is often the domain of the first or second finger. This can create a tendency to overshoot the target area with either the thumb or the fourth fingers, a problem that can to some degree be alleviated though accurate synchronization.<sup>393</sup> Each new position begins with a down-stroke on the fourth finger. This gives the exercise a commonality that can be synchronized with position movement whilst correcting any placement issues. With so much activity revolving around the sequential transition

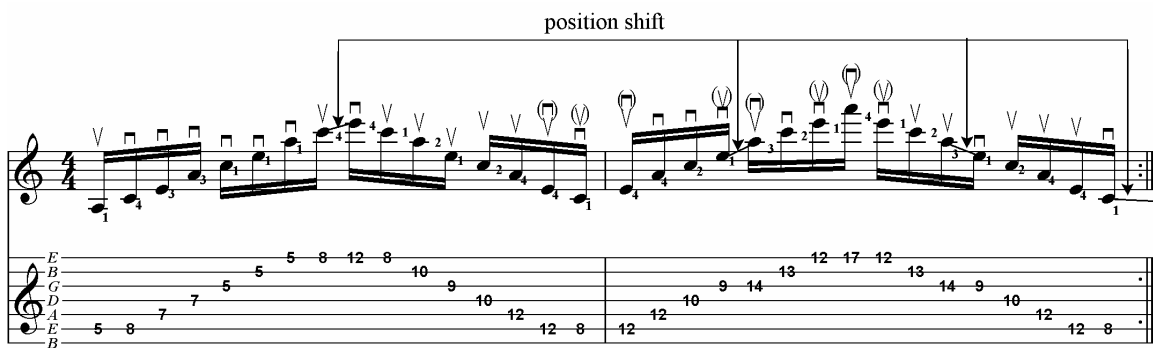
<sup>393</sup> Gilbert, *Intense Rock 2*, 1991.



### 5.6.8 Larger string groupings

Diatonic linear motion is not restricted to the top three strings. In order to expand this idea more strings must be added. Although Figure 50 is the same A minor arpeggio as the previous exercise, the addition of more strings gives the arpeggios an expanded range in one position. Consequently, the need for positional movement is reduced in order to gain extra notes.

Figure 50



A cursory observation of this form reveals similarities with a number of the patterns found in the *Caprices*, most notably in the final section of ‘Caprice No. 24’. However, whilst the general contours of the arpeggios are similar, the linear motion is based around three A minor triads, all of which are in root position. The irregularity of the position shifts is reminiscent of a realtime playing context, where the motion is dictated largely by the surrounding bars (string tone and other considerations notwithstanding).

These irregularities are mirrored in the transitional finger motion and, as in the previous exercises, require synchronization with the down-strokes.<sup>395</sup> The uniformity this provides helps the left hand accurately locate the first note of the new position, with the subsequent fingers following suit.

<sup>395</sup> Gilbert, *Intense Rock* 2, 1991.



With this kind of arpeggio displaying so many variables, it is important to remember that although they require discussion as separate entities, none functions independently.

Plectrum pressure, palm dampening, string gauge, string elasticity and tension, dynamics (how hard the string is struck) and how much of the plectrum is used, are variables that change in relation to neck position. Each of these variables has acceptable extremes which are dictated by the music. In-between these parameters certain aspects of these variables can be used to exaggerate, complement, or “tame” other variables. For example, using an excessive amount of plectrum pressure, depth and strength, to strike the string can in itself be defined as beyond these parameters. However, this kind of excess can be controlled through the use of heavy dampening, thus preserving the melodic material.

With the involvement of so many strings with such large position shifts, there is a danger of attempting the entire exercise with the same plectrum pressure. When sweeping through so many strings in such vastly different positions on the neck, adjustment of the plectrum pressure often helps to compensate for the changing conditions.

Unlike the previous exercise where the position changes were more incremental and predictable, the ability to display a consistent tone can require more radical pressure changes, especially at transition points. For example, striking the high A on the 17<sup>th</sup> fret with the same strength as the A on the 5<sup>th</sup> fret would most likely result in an incompatible string tone.

Because of their symbiotic relationship and the importance dampening plays in controlling string tone and string amplitude, changes in plectrum pressure should be reflected in palm pressure. For example, controlling amplitude and string tone of Figure 50 require the lower strings to have more dampening than the thinner-gauged strings. Failure to control the strings' vibration can result in lack of note definition and attack, a common problem when attempting larger sweeps.<sup>396</sup>

In order to expand the technical scope of sweep-picking, Figure 51 utilizes a sequential idea similar in form to Figure 48, one of the major differences being that it encompasses six strings.

Figure 51



From a transitional viewpoint, Figure 51 is relatively uniform with position shifts occurring at the end of every half bar, precipitated by either the fourth or the first finger. Position shift motion is aided by four alternately-picked notes at each turnaround point, optimizing plectrum motion and initiating sweep-picking for the subsequent arpeggio.

<sup>396</sup> Gilbert, *Intense Rock*, 1988.

### 5.6.9 Linear motion arpeggio summary

Due to the nature of tuning, there are many different positions where the same arpeggio and its inversions can be played. Therefore, it is vital to have the ability to execute arpeggios and their corresponding inversions in many different positions on the guitar neck.

To facilitate these large position shifts, incremental motion creates a more fluid position movement by breaking down a large movement into several smaller components.

However, incremental movement is not necessary when a small position shift occurs; in these cases, the focus is placed on ensuring that the transitional finger is in its correct position. Precise transitional finger placement allows accurate relative placement of all subsequent fingers. The relationship between position shifts and transitional finger movement can be aided by their synchronization to the plectrum strokes.<sup>397</sup> Recognizing this when performing the *Caprices* can help accurate positional relocation when obvious uniformity is absent.

As has been illustrated earlier, the more strings involved the more variables are placed in the equation, creating the potential for more problem areas. These issues largely revolve around the changing string gauges and string elasticity throughout the sweep, which impacts plectrum pressure and dampening variables.

While a multitude of other mobile arpeggios exist, all the relevant tools and issues to tackle the *Caprices* from a contextual viewpoint have been discussed in this section.

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<sup>397</sup> Gilbert, *Intense Rock 2*, 1991.

## 5.7 String-skipping sweep-picking

### 5.7.1 Introduction

Sweep-picking lends itself to adjacent string motion and to this point the scope of the musical exercises and techniques have been limited to this concept. Consequently, all the tools needed to tackle the sweep-picking contexts have been covered with the exception of ‘Caprice No. 1’. Due to its particular technical challenges, one of the most efficient methods of playing the majority of this caprice is with the technique of string-skipping sweep-picking. The ability to skip certain strings in an arpeggio at will opens a new avenue of technical development with unique chord voicing and harmonic possibilities.

### 5.7.2 Multiple skips

Figure 52 exemplifies the typical contours of a string-skipping sweep-picking arpeggio mentioned above.

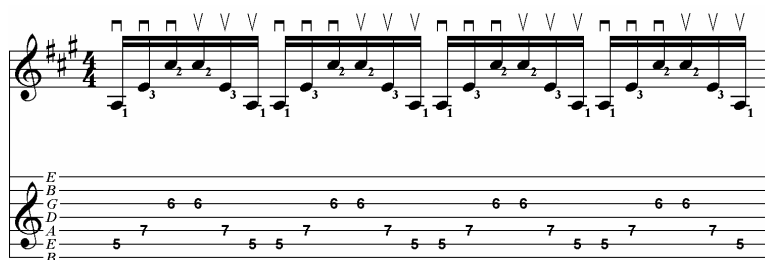
Figure 52

‘Caprice No. 1’, bar 5



Before attempting multiple skips, it is important to familiarize oneself at a fundamental level with the unique demands this sweep-picking technique places on plectrum motion.

Figure 53



Comparatively speaking, the note density is further reduced, resulting in more right-hand motion per note than its adjacent string counterpart. With the more extreme motion per note, variables previously controlled by an incremental alteration become more susceptible to incorrect execution.

The area where difficulties are most likely to arise is the actual physical movement both during and immediately following the actual string skip. At this point, the plectrum requires adequate elevation in order to clear the “skipped” D string. Contextual definition of the term “adequate” is subjective since it is dictated to a large extent by the guitarist’s ability to execute correctly the note following the skip. Excessive elevation of the plectrum above the skipped string can force the right hand out of position, severely hampering its ability to control, modify, or create desirable string tones. Moreover, in order to regain correct hand position an “on-the-fly” adjustment is required, which is extremely problematic at fast tempi.

Where insufficient plectrum elevation is present, there is a high probability of striking the skipped string. This excess string noise can also be remedied “on-the-fly”, by employing either the palm of the right hand or the underside of the unused fingers of the left hand. Although striking the skipped string can be remedied to a certain degree through dampening, the initial attack is always audible.

These kind of “on-the-fly” modifications are a secondary option to playing the exercise correctly and in many situations are simply impractical. The degree to which it is impractical either to dampen strings or reposition the right hand is largely dependent on the tempo of the notes being played. For example, attempting either of these solutions whilst performing ‘Caprice No. 1’ at the correct tempo, can result in increased problems.

Occasionally in string-skipping sweep-picking, slight positional indiscretions and their resulting extraneous string noise can be masked by utilizing these techniques. This is especially relevant when multiple arpeggios are being played requiring the same string to be skipped. If at any time the skipped string is struck, failure to prevent its vibration can result in a continuous open string note. Left unchecked, this will permeate all the arpeggios until either a new note is fingered on the offending string, or it reaches the end of its natural vibration cycle. To further compound this issue, the offending string is usually struck with an excess amount of force, being part of the actual arm movement rather than the normal controlled wrist motion. For the aforementioned reasons, it is often prudent to make string-skipping sweep-picking a more heavily palm regulated sound, especially in its initial development stages and on the lower strings.

Within string-skipping technique, striking unwanted strings is a point of ongoing concern, often arising in conjunction with inadequate technique and undisciplined excessive speed. Complex combinations of alternate-picking and sweep-picking within the string-skips exacerbate the string noise issue, as do a number of other variables most of which revolve around hand relocation.

The main factor when string-skipping, is accurately locating the new string with the optimum relative plectrum angle remaining constant. As in adjacent string motion, retaining this is dependent on the physical repositioning of the wrist at the point where the “skip” occurs. This motion is more exaggerated physically than its incremental adjacent string counterpart, requiring repetitive practice to become accustomed to the required distance.

When initially practicing string-skipping in exercises such as this, there can be a natural tendency to reach for the notes instead of relocating the hand. This can be achieved by twisting the wrist out of its normal position and altering the orientation of the plectrum angle by adjusting the finger grip on the pick. Because there are so few notes immediately following the skip, repositioning the palm can appear inefficient. These, in conjunction with the ability to retain one dampening palm position controlling extraneous string noise, are all contributing factors promoting this technical mind set. Although reasonably effective in this specific exercise, its limited application becomes apparent with the increased severity of the skips and can impede future technical advances.

### **5.7.3 Alternating string-skipping sizes**

Figure 54 emphasizes the validity of this point, with access to E on the larger skip being much more difficult without a position change. Focused on the accurate location of strings through the exploration of alternating skipped string denominations, its success is dependent on a number of different technical variables. The ability to skip any number of strings to locate harmonic or melodic fragments is essential for both ‘Caprice No. 1’ and a multitude of other harmonic chord voicings.

[illegible]

As string-skipping sweep-picking action becomes more familiar, less arm and more wrist movement can then be employed at the aforementioned turnaround points. By relegating the elbow to the role of delivering the plectrum to its target destination, the more efficient wrist motion can then be utilized to increase speed.



As the speed increases, so too does the strength in which the strings are struck immediately after a skip, which may require reduced plectrum pressure at these points. By softening the plectrum grip during the skip, when the next string is struck the full force of the elbow movement is reduced. The ability to retain a dynamic continuity between the initial notes and the notes directly following a string skip is, to a reasonable degree, dependent on the plectrum pressure. As the string skips alternate between strings of different gauges, plectrum pressure can be altered to take these variables into account. In essence, by loosening the plectrum grip, its rigidity is reduced allowing it to flex more easily in the opposite direction to that of the sweep. For example, by applying less plectrum pressure on the first skip of Figure 54, the plectrum naturally flexes towards the previous notes in the opposite direction of the sweep. This approach is similar to using a very flexible plectrum with a rigid grip or a strumming approach where the angle of the plectrum can alter to accommodate playing five or six strings in one motion. Although minor, as with all plectrum modifications, there are a number of positive and negative points that require discussion.

Allowing the plectrum to flex to such a degree can obscure the initial note attack. However, this is often only apparent when the plectrum is placed too deeply into the strings, causing the string to be struck with a larger part of the plectrum,<sup>398</sup> which, in turn, can mask the attack. That this issue becomes less apparent as the tempo increases, is largely due to the fact that in order to increase tempo, less of the plectrum must strike the string.<sup>399</sup> Closely related to this point is the fact that this style of plectrum grip promotes a weak note attack, making a stronger dynamic more difficult to achieve.

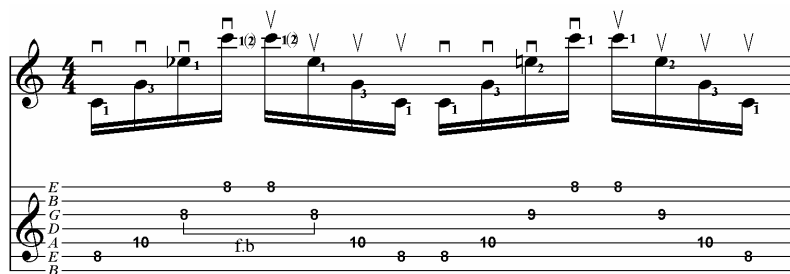
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<sup>398</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>399</sup> Observed in Gilbert, *Intense Rock 2*, 1991.

In Figure 54, the skips on the C sharp and the E are on neighbouring strings. This creates a situation in which the palm can arrive at the same position after each skip and still comfortably reach both strings. Although this is possible, it is most desirable to treat each new palm position as a separate entity; their individual placement variables after the skip being idiosyncratic rather than universal. Adopting this mode of thinking facilitates the expansion of string-skipping as it encompasses multiple skips of varying intervals.

Figure 55



In contrast to previous string-skipping arpeggios, where the palm could rest immediately after the skip, this exercise requires the palm to dampen momentarily the third of the chord on the eighth and ninth frets respectively. The term “dampen momentarily” is defined as enough time to strike the string and in turn modify its vibration with the palm, before moving to the next string. Moving across the strings in this fashion inherently generates extraneous string noise at the point when the palm is lifted off the strings.

This brings into focus the two methods of moving from one position to another during string-skipping sweep-picking with the palm. The first and most obvious method is to lift the palm off the strings, replacing it in its new position; the second, to slide the palm across the strings from one position to the next. The first method can generate string noise when the palm is lifted from the initial position; the second method can create noise after the initial strings are left unattended by the palm. In the second method, pushing the palm from one position to another can create an underlying string noise albeit very subtle. However, it does have the advantage of controlling sympathetic string vibration in addition to modifying the target string’s vibration.

At the turnaround points on the high E string, the methodology and execution should be similar to the previous two exercises with a subtle plectrum pressure alteration accounting for the reduced string gauge. Although the alternate fingering is easier from the viewpoint of note differentiation, in order to expand the extent of development the finger-barré is the preferable option.

When developing any positional technique, the subject of positional motion must be addressed if the process is to reach its full potential. The embodiment of movable triadic

inversions that arise in ‘Caprice No. 1’ can be seen in Figure 56, first beat of bar 3, second beat bar 5 and the second beat of bar 8. These examples correspond to the exercise, in terms respectively of their relation to harmonic chord voicings and fingering patterns although the actual notes and their order differ.

Figure 56

In contrast to previous string-skipping sweep-picking forms, non-overlapping transitional motion is now a factor, creating the need for relatively large movement in the left hand. As in previous transitional motion, the key lies in the synchronization of the transitional finger with the plectrum strokes. In this case, transitional motion is precipitated by the first finger on a down-stroke, in effect moving from the 5<sup>th</sup> to the 9<sup>th</sup> fret, the 9<sup>th</sup> to the 12<sup>th</sup> fret, returning to the initial position after the repeat.

As a technical precedent has already been set in adjacent transitional string movement its replication is rendered mute with regard to a direct translation to string skipping. However, there are a number of issues that are exclusive or more relevant in nature to string-skipping.

Figure 56 presents familiar alternative plectrum strokes, although in string-skipping they are utilized directly after the second and before the third skip of each arpeggio. Using a continuous plectrum motion on cursory examination can appear to be the preferred method. However, the plectrum motion immediately prior to the third skip is then in the opposite direction to the subsequent note. This requires the plectrum to be pulled back over the E and skipped B string in order to strike the G string with an upstroke. In its adjacent counterpart this inefficient motion is easier to combat due to the close proximity of the strings. However, the increased distance between strings created by the string-skipping harmonic voicings, requires more extreme motion. The solution to this is an arm movement combined with a minimal wrist motion, of which the wrist segment is standard alternation, reflecting none of the radical arm movement. The large degree of movement is dictated by the retention of the optimum plectrum angle relative to the string. Incremental wrist/elbow movement can often render both variables out of position; whereas one large, flowing motion with the arm can often function more desirably. The degree to which the motion takes place often depends on the individual physical attributes of each guitarist.

Utilization of the alternative plectrum strokes eliminates the third skip issue. However, in order for this to happen, an alternate-picking stroke must occur during the second skip of each arpeggio. Unlike its third skip counterpart, the plectrum motion on the G string is towards the subsequent note, making it both more efficient and fluid.

When positioning the right hand at the turnaround point, it is important to avoid pushing the plectrum too far past the target string on the first note. As the first note is part of the sweeping motion it is more prone to exceed the optimum distance beyond the string.

This creates the need for excessive wrist motion on the subsequent note. Optimum distance as applied to string-skipping sweep-picking is dependent on the vibration of the string in question. In turn, the amount of vibration is reliant on a number of variables such as string tension and neck position, dynamics, string gauge and tempo. All these being equal, the optimum distance the plectrum can travel past the string at a turnaround point; can be defined as “the distance required so as not to inhibit natural string vibration, yet far enough to strike the subsequent string with its required dynamic”.

#### 5.7.4 Note sequencing

Sequencing notes has been popularized by composers ranging from Bach and Beethoven, to Yngwie Malmsteen<sup>400</sup>, Frank Gamble,<sup>401</sup> and Paul Gilbert<sup>402</sup>. Figure 57 and 58 illustrates how sequencing notes within an arpeggio framework works within ‘Caprice No.1’ and can be expanded to the string-skipping idea.<sup>403</sup>

Figure 57

‘Caprice No. 1’, bar 69

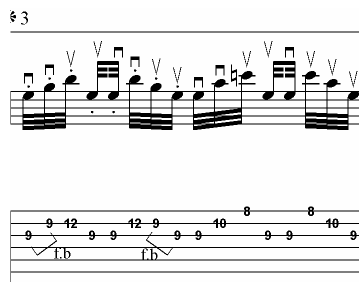


Figure 58 integrates aspects of note sequencing previously discussed in to the string-skipping sweep-picking concept.

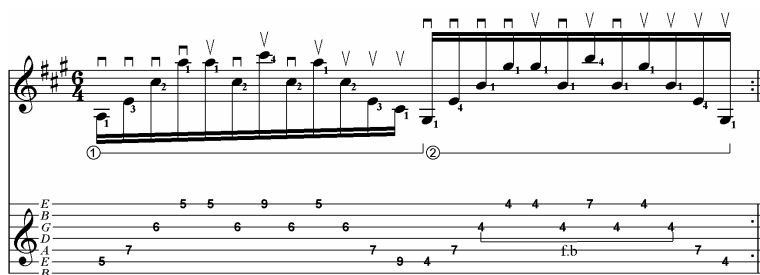
<sup>400</sup> Yngwie J Malmsteen, *Play Loud! The Third Movement, Classical Styling*, Japan: YG Factory Inc., 1995.

<sup>401</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>402</sup> Heard in ‘Scarified’, Racer X, *Street Lethal*, Shrapnel Records, Inc., SH-1023, 1986.

<sup>403</sup> Gilbert, *Intense Rock*, 1988. ; Gilbert, *Guitar Techniques*, 2006.

Figure 58



As the note sequencing elements require multiple skips over the B string, the plectrum motion of the alternate-picking component always moves toward the subsequent note. In this fashion, plectrum motion functions at optimum efficiency, a by-product being that the motion focuses on the equilibrium point at equal distance between the two strings. In effect this functions as a point of reference for palm placement, a position from which the strings are struck exclusively utilizing wrist motion as opposed to continually moving the arm. Comfortably settling on the equilibrium point, the palm must equally be able to modify and control the vibration of either string. The sweep-picking sections utilize incremental elbow and wrist combinations, whilst the alternate-picking component utilizes minimal elbow mobility in conjunction with larger wrist movement. Although in previous exercises, the practice of pivoting the wrist to attain notes has been inappropriate, in this case it is a logical option due to the note per string density and the tempo.

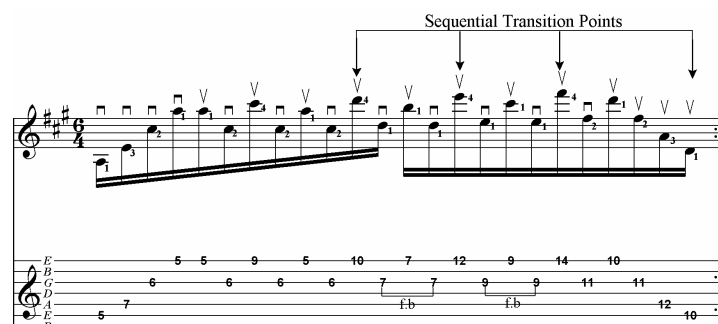
The defining factor when playing these arpeggios is a technique that promotes clear note differentiation, an aspect that the use of extended finger-barré can put at risk. Using one finger to fret so many notes can create the problem of controlled note duration and in turn can mask the initial attack of the subsequent note/s. The solution is a modification of the sweep-picking adjacent string finger-barré technique, in which the finger-barré pivots

between the tip (fretting the note on the high E string) and further down the finger (fretting the note on the G string). This pivoting or rocking motion between the two positions on the same finger can be utilized to control note duration just as if the notes were played with two individual fingers. Utilizing a finger-barré as opposed to two individual fingers has an added advantage; the B string is constantly covered and therefore prevented from any kind of unintentional string vibration. This factor can allow more latitude within the defined parameters of palm placement, in turn allowing more scope for slight variations in plectrum angle and string tone colourings.

Remaining with the theme of optimized efficiency, it is often prudent for the finger-barré to retain the same position throughout the entire section. This has the advantage of minimizing the amount of movement in the fingerboard hand, dividing the responsibility of note differentiation between fourth finger placement and finger-barré rocking motion. This advantage is in addition to controlling note duration and dampening unwanted sympathetic string vibration.

Figure 59 illustrates the utilization of economic plectrum motion in sequential string-skipping sweep-picking, to affect transitional motion through diatonic root position arpeggios.

Figure 59





In order to affect this transitional motion successfully, plectrum motion and the palm position must remain consistent throughout. However, the finger-barrés are more movable than in the previous exercise, utilizing a parallel barré shift in order to attain the new fret-board position.

This movement is aided by a uniform transitional finger motion synchronized with alternately-picked up-strokes to facilitate its correct execution. From a transitional viewpoint the fourth finger is solely responsible for the subsequent relative finger placements, being “slid” to its new position.

Although the sequential transitions revolve heavily around the alternately-picked sections, the overall mind-set is still deeply-rooted in string-skipping sweep-picking. By maintaining this philosophy, plectrum pressure associated more with sweep-picking can be maintained, thus promoting more continuity throughout the music.

### 5.7.5 Sequential transitions

Exceeding the technical boundaries defined in ‘Caprice No. 1’, Figure 60 extends into the realm of multiple sequential transitions.

Figure 60

The musical score for Figure 60 is presented in a single staff with a treble clef, a key signature of two sharps (F# and C#), and a 2/4 time signature. The melody consists of a series of eighth and sixteenth notes, with fingerings (1-4) and pick directions (V for upstroke, ^ for downstroke) indicated. Below the melody, a fretboard diagram shows the string positions for each note, with fret numbers (5, 6, 7, 9, 10, 11, 12) and string numbers (E, B, G, D, A, E, B) labeled. A bracket labeled 'Sequential Transition Points' spans the first three measures of the melody. The score ends with a double bar line and repeat dots.

Utilizing two simple sequential ideas within the framework of sweep-picking string-skipping creates a number of unique fingering issues. These are addressed utilizing the alternative fingerings which are provided in order to prevent the hand from twisting in the larger stretches which occur between the 5<sup>th</sup> and the 10<sup>th</sup> fret.

It is worth noting that on the last sequential skip, sweep-picking rather than alternate-picking was used. The purpose of this was to facilitate an optimal plectrum motion for the subsequent non-sequenced portion of the arpeggio.

#### **5.7.6 String-skipping sweep-picking summary**

Although a complex technique, string-skipping sweep-picking opens up an entire category of harmonic chord voicings not normally associated with electric guitar technique. Within the technique itself a number of consistently re-occurring technical factors are present, all of which have associated variables that require constant monitoring. These include palm dampening positions, plectrum angles relative to string, plectrum pressure relative to string gauge and the interaction between the wrist and elbow motion.

All of these factors have acceptable parameters within which technical variations function; the outer extremities, however, can produce unpredictable musical results. Nonetheless, the complex interactions between the aforementioned factors can be intentionally used to modify either the effects of another technique or the strings vibration.

Throughout this part of the chapter there has been consistent reference to ‘Caprice No. 1’ due to the almost exclusive use of string-skipping sweep-picking. However, many of the tools employed within this section are also relevant to many other playing situations throughout all the *Caprices*. These situations can vary from utilizing a single skip to move to a new position, to entire sections utilizing string-skipping as in ‘Caprice No. 1’.

## **5.8 Chapter Summary**

The optimized motion that sweep-picking provides, promotes a more fluid and easier method of playing technically challenging genres of music. Although scalar motion can be improved by the efficiency sweep-picking provides, it is in the low notes per string density of arpeggios where the obvious technical benefits become apparent.

The simplicity of sweep-picking is not always reflected in its practical application especially when applied to technically challenging forms of music such as the *Caprices*. This has much to do with many of the other subordinate and problematic technical elements that are required in order to facilitate economical motion. All of the aforementioned subordinate issues are defined with workable parameters between which variations can still be used effectively. Individual technical elements can be manipulated to modify other elements; this is especially relevant from a dynamic, string tone or note-colouring standpoint. All the elements discussed are weighted equally in terms of their importance in ensuring musical continuity throughout.

When reducing the chapter to its most fundamental components, all technical exercises fall into the categories of either adjacent string motion or string-skipping motion.

However, unlike alternate-picking that can occur in relative isolation, sweep-picking does

not. Its success within the *Caprices* is largely due to its relationship with alternate-picking, the utilization of which precipitates a more passive sweep-picking approach to plectrum tension. The alternate-picking component of any sweep-picking pattern exhibits less aggressive plectrum tension traits than is normally indicative of “stand-alone” alternate-picking.

The utilization of finger-barrés plays an intricate role throughout the technical vocabulary of sweep-picking. As the note-per-string density drops with musical motifs such as arpeggios, sweep-picking efficiency becomes of paramount concern. Finger-barrés provide the vehicle to maximize the efficiency of the sweeping motion when multiple notes on different strings occupy the same fret. Although not exclusively the domain of sweep-picking, finger-barrés provide a challenge for correct note differentiation especially in the area of note duration, attack and string tone uniformity.

## Chapter Six: Alternate-picking

### 6.1 Introduction

By its very nature the use of a plectrum to create string vibration promotes two types of picking motion: up-strokes and down-strokes.<sup>404</sup> The combinations of these two motions are commonly referred to as alternate-picking.<sup>405</sup> Unlike the economy of motion inherent in sweep-picking, alternate-picking is a versatile technique with aggressive overtones created through plectrum attack.<sup>406</sup> Although arguably viewed as a weak point, this attack can also be exploited for its percussive qualities,<sup>407</sup> making its unique sound one of its greatest strengths.<sup>408</sup> It can be applied to a diverse range of musical contexts for any number of reasons, from dynamic impact and variation<sup>409</sup>, to fast flowing scalar figures requiring defined note separation.<sup>410</sup>

### 6.2 Fundamentals

#### 6.2.1 Basic application

Although fundamental in theory, the ability to utilize this technique throughout the *Caprices* provides a more varied tool palette for musical solutions in different contexts. Figure 1 illustrates the scalar form at a fundamental level, showing the issues that need to be addressed when applying this technique to the *Caprices*.

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<sup>404</sup> Observed in Gambale, *Chop Builder, The Ultimate Guitar Workout*, 1994.

<sup>405</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>406</sup> Heard in 'Inferno', Racer X, *Street Lethal*, 1986.

<sup>407</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

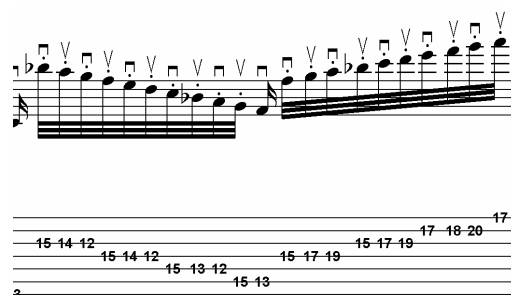
<sup>408</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>409</sup> *Ibid*

<sup>410</sup> Heard in 'Viking Kong', Racer X, *Superheroes*, 2001.

Figure 1

‘Caprice No. 7’, bar 22



In contrast to sweep-picking, alternate-picking excels where note density per string is highest.<sup>411</sup> As with sweep-picking, however, alternate-picking can be adapted for use where the note density per string is relatively low,<sup>412</sup> creating a large area where the techniques overlap. Within this area, the choice of technique can determine the correct representation of the musical intent, or conversely can deliberately alter the original sound. In this case, to re-create the *staccato* sound<sup>413</sup> a more aggressive alternate-picking style flanked by heavy palm dampening can be used,<sup>414</sup> which most accurately represents the written note.<sup>415</sup>

From the viewpoint of timbre, alternate-picking can function as an alternative to sweep-picking, with its stronger plectrum tension and resulting aggressive attack.

### 6.2.2 *Staccato*, alternate-picking, and bow strokes

Although the subject of violin bow strokes can be a topic of intense discussion, it is important for the electric guitarist to have a rudimentary understanding of the relationship between the *staccato* bow strokes used in the *Caprices*, and alternate-picking strokes. By

<sup>411</sup> Observed in Meola, *Masters Series*, 1991.

<sup>412</sup> *Ibid*

<sup>413</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>414</sup> Observed in Steve Morse, *Power Lines*, Seattle, R.E.H. Publications, 1992.

<sup>415</sup> Brown, ‘Dixie Flyer’, pp. 37-46.

its very nature alternate-picking consists of continuous up-strokes and down-strokes.

Therefore, the relationship between alternate-picking and bowing can be limited in scope to bowing techniques that require consecutive up-strokes and down-strokes. This being said, many characteristic parallels can also be found in non-alternating continuous bowing motion techniques, such as *jeté*, *ricochet*, and up-bow and down-bow *staccato*. However, for the purpose of drawing parallels, these have more in common with the continuous stroke motion of sweep-picking.

In order to understand the relationship between alternate-picking and bow strokes it is important to define their fundamental differences. When the plectrum strikes the string, the string vibrates until modified by the palm or another note is struck; when a string is bowed, the string vibration can continue for the length of the bow stroke(s) or until the note decays. Constant bow contact affords the violinist the option for continuous note modification throughout its duration. Characteristics such as volume swells are not possible using the single striking motion of the plectrum unless volume swells are employed through the use of a volume knob.<sup>416</sup> From the perspective of initial string attack, plectrum use is more akin to *pizzicato* or *col legno*, where once struck, the note can then only be affected through the use of left-hand motion, such as vibrato.

Although the two instruments differ in nature, a number of similarities occur when comparing alternate-picking to bow strokes. These are most notable when comparing *spiccato* to plectrum use in alternate-picking and range from specific points to analogous parallels and concepts. Many of the other “on-the-string” bowing techniques such as

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<sup>416</sup> Heard in ‘Cathedral’, Van Halen, *Diver Down*, 1982. ; ‘Icarus Dream Suite’, Malmsteen, *Rising Force*, 1984.

*marcato*, *martelé*, *sautillé* and *saltando* also exhibit technical parallels. However, within the technique of *spiccato*, controls over many technical aspects arise that have parallel concerns in alternate-picking.

One such issue is the angle at which the bow strikes the strings and its resulting tone colour and note duration implications; i.e., the more vertical the bow arc, the sharper, more accented, and percussive the tone quality.<sup>417</sup> Unlike the bow, the plectrum tip moves into position below the string immediately before striking it.<sup>418</sup> However, the similarities occur in the plectrum angle versus the bowing angle; the more acute the angle that the plectrum strikes the string, the more abrupt the attack and sharper the tone.<sup>419</sup>

As in *spiccato*, where the height of the bow drop influences string tone and dynamics,<sup>420</sup> the height from which the plectrum is dropped onto the string also affects the note's characteristics. The amount of vertical element in the attack strokes of both instruments can be manipulated to create a more percussive, accented stroke.<sup>421</sup>

Alternate-picking and *spiccato* are both characterized by up-strokes and down-strokes. Seen traditionally as a weakness that can restrict tempo,<sup>422</sup> both techniques can minimize this tendency through economy of movement. In order to do this, both techniques restrict the distance that the bow or plectrum is removed from the strings between alternating

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<sup>417</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 75.

<sup>418</sup> Observed in Gilbert, *Intense Rock 2*, 1991.

<sup>419</sup> Shawn Lane, *Power Licks*, Miami: CPP Media Group, 1989.

<sup>420</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 75.

<sup>421</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>422</sup> *Ibid*



strokes.<sup>423</sup> As tempo increases, the focus of the motion in alternate-picking moves from the arm to the wrist as it does in violin bowing strokes.<sup>424</sup>

Another similarity arises when string crossing is necessary. Evenly-balanced transitions between strings require the same plectrum position relative to the string,<sup>425</sup> a technique analogous to retaining the same amount of bow hair striking the strings at the crossover point in violin playing.

This study acknowledges there is an entire field within cross-instrument technical comparisons and methodologies that requires further investigation. However, the present study requires the acknowledgment of noticeable similarities within right-hand techniques in order to adequately replicate the original musical intent when desired.

### **6.3 Micro elements**

In order to gain an appreciation of the technical interactions at a fundamental level, alternate-picking is examined in small fragments or segments.<sup>426</sup> This allows a sharper focus to be placed on the development of individual concerns<sup>427</sup> before tackling the larger macro technical aspects.

#### **6.3.1 Static position**

Alternate-picking within a static position on a single-string, as illustrated in Figure 2, represents the technique at its most fundamental.<sup>428</sup>

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<sup>423</sup> Galamian, *Principles of violin playing and teaching*, p76.

<sup>424</sup> *Ibid*

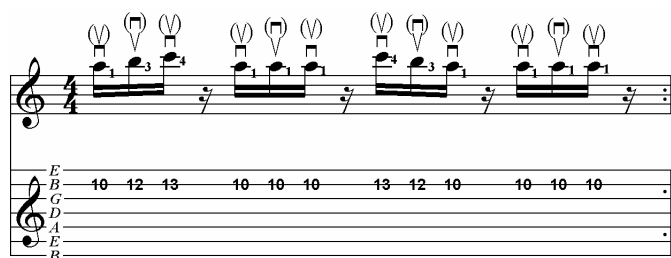
<sup>425</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>426</sup> Petrucci, *Rock Discipline*, 1995.

<sup>427</sup> *Ibid*

<sup>428</sup> Gilbert, *Intense Rock*, 1988. ; Meola, 'Picking with Al Di Meola', pp. 64-68.

Figure 2



Prior to attempting scalar melody or more complex alternate-picking patterns, a basic understanding of the synchronization between the two hands is required.<sup>429</sup> For this express purpose, a continually changing three-note finger pattern can be used in order to familiarize oneself with the requirements of synchronization. Reiterating this motion helps develop speed and accuracy in addition to economy of motion.<sup>430</sup>

Aided by an unchanging plectrum stroke pattern, ascending, descending, and single note patterns are all addressed in their fundamental form.<sup>431</sup> Where the plectrum strokes occur in relation to melodic material, is dependent on the initial stroke, a principle similar to that found in sweep-picking.<sup>432</sup> Prudence, therefore, dictates that a familiarization with both possible initial strokes is required<sup>433</sup> thus giving rise to the need for bracketed alternative plectrum strokes.

Scalar melody within the *Caprices* requires the ability to move to the adjacent string,<sup>434</sup> as illustrated in Figure 1. Figure 3 addresses this need by moving the first finger from the B string to the E string with a corresponding movement in the plectrum hand.

<sup>429</sup> Meola, 'Picking with Al Di Meola', pp. 64-68.

<sup>430</sup> *Ibid*

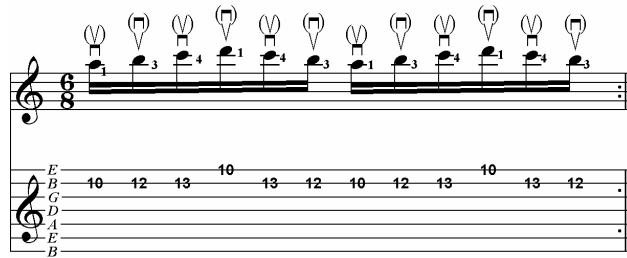
<sup>431</sup> Morse, 'My Personal Picking Exercise', p. 124.

<sup>432</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>433</sup> Petrucci, *Rock Discipline*, 1995.

<sup>434</sup> Meola, 'Picking with Al Di Meola', pp. 64-68.

Figure 3 1



One of the fundamental differences between sweep-picking and alternate-picking is the amount of space required for the plectrum hand to complete an adjacent string motion. The extra motion that the plectrum requires gives the technique more power to strike the string, which in turn results in stronger attack and a louder dynamic level.

The immediate issue in this exercise is to develop the ability to lift the plectrum from the B string over the adjacent E string, striking it with an up-stroke, before moving back to the initial string.<sup>435</sup> The motion should be no more than is needed to strike the string and return the plectrum to its original position.<sup>436</sup> By utilizing the same motion, the last note on the initial string is struck towards the subsequent adjacent string. For example, movement from the B to the upper E string should be made using a down-stroke whereas movement from the B to the lower G string is more economical with an up-stroke. However, this can only occur when the correct number of notes preceding the crossover point is present in order to facilitate the economical motion.

As economized motion is less of a concern in alternate-picking than in sweep-picking, musical technique is often more dominant in influencing technical mechanics. However,

<sup>435</sup> Gilbert, *Intense Rock*, 1988.

<sup>436</sup> Meola, 'Picking with Al Di Meola', pp. 64-68.

within the rigid stroke motion of alternate-picking, modifications to right-hand positioning are constantly being undertaken to increase efficiency in the plectrum hand.

Another factor that can be modified to facilitate easier alternate-picking is the choice of strings that certain notes are played on. In Figure 3, movement between the strings can be viewed as two individual positions or one hybrid position that covers both strings. The advantage of the latter is the elimination of the need to change positions for a single note on an adjacent string. Although this practice requires modification when string-skipping is used, for adjacent-string motion it functions adequately.

### **6.3.2 Alternate-picking dampening**

The hybrid hand position allows slightly less control over the amount of dampening used between the two strings, a consequence of never removing the palm from the strings to change position. Although sweep-picking utilizes dampening to control string tone, one of its primary functions is the reduction in extraneous string noise<sup>437</sup> which helps to create clean, clear notes.<sup>438</sup> Dampening within the technique of alternate-picking is crucial<sup>439</sup> in controlling string tone and note duration,<sup>440</sup> the latter becoming more important at faster tempi, due to the need for clear note separation.<sup>441</sup>

As the density of notes per bar increases, the need for each note to have a definite beginning and end point becomes more essential. Figure 4 illustrates an octave transposition of the main *Caprice* melody which is played at a rapid tempo.

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<sup>437</sup> Brown, 'Dixie Flyer', pp. 37-46.

<sup>438</sup> *Ibid*

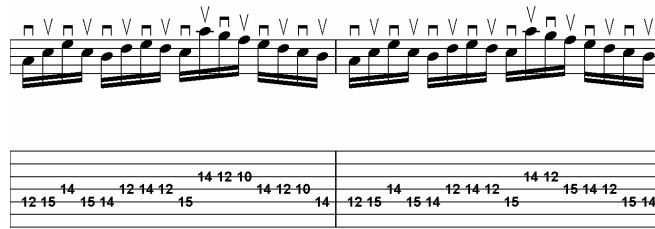
<sup>439</sup> *Ibid*

<sup>440</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>441</sup> Heard in 'Technical Difficulties', Racer X, *Technical Difficulties*, 2000.

Figure 4

‘Caprice No. 5’, bars 8-9



Paganini’s use of *staccato* throughout ‘Caprice No.5’ creates rapid-fire notes which are in contrast to the *legato* arpeggiation and scalar passages of the introductory bars. Creating a similar *staccato* effect using alternate-picking is possible using the correct plectrum grip pressure in combination with palm dampening.<sup>442</sup>

Creating different styles of *staccato* is possible through a synthesis of two factors: the strength with which the string is struck; and the corresponding weight of the dampening. Both factors are combined in varying degrees with each alteration creating a differently nuanced *staccato*.<sup>443</sup> For example, hitting the strings hard with the plectrum, in conjunction with heavily dampened strings, creates a *staccato* more percussive in nature.<sup>444</sup> Conversely, notes struck extremely lightly with virtually no dampening have a less stifled, open *legato* quality.<sup>445</sup>

While either end of the spectrum can be used, there is a generalized trend that can be discerned through the observation of many players. Within the technique of alternate-picking, notes that are longer in duration with more expression tend to utilize a more open sound with little or no dampening. In contrast, faster music requires heavier

<sup>442</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>443</sup> Observed in Morse, *The Essential Steve Morse*, 1991.

<sup>444</sup> Observed in Morse, *Power Lines*, 1992.

<sup>445</sup> Observed in Gilbert, *Terrifying Guitar Trip*, 1995. ; Gambale, *Monster Licks and Speed Picking*, 1988.

dampening in order to get clear note separation and the resulting percussive quality is proportional to the strength of the plectrum attack.<sup>446</sup>

### 6.3.3 Correct amount of dampening

Working from the premise that maximization of the melodic and harmonic content of alternate-picking is most desirable, minimization of the percussive element of the note is required.<sup>447</sup> Therefore, the correct amount of dampening can be defined as no more than is necessary to facilitate maximum note resonance<sup>448</sup> whilst controlling tone, note duration and extraneous string noise. Plectrum pressure and the strength with which the string is struck can also affect the amount of dampening, making the “correct” amount a fine balance between all the aforementioned factors.

The successful application of dampening requires consideration of musical content, the strongest component of which is tempo. With an increase in tempo, incremental increases in palm pressure (dampening) against the strings are required. Unless otherwise desired, the body of the note should never be obscured by the attack of the plectrum, which becomes more likely as tempi increase.

Figure 5 illustrates a contrast to the hybrid principle discussed in relation to Figure 3. Moving equally between the two adjacent strings creates the need for the hand to be repositioned as opposed to reaching for the note on the new string.

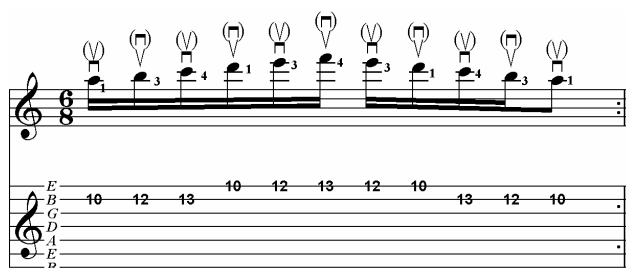
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<sup>446</sup> Heard in ‘Paul’s Solo’, Racer X, *Live Extreme Volume*, 1988.

<sup>447</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>448</sup> *Ibid*

Figure 5



The development of adjacent string motion is an essential skill to master at a micro element stage as it is fundamental to scalar elements and phrasing of the *Caprices*. In order to facilitate factors such as relative plectrum angle, dampening and even string tone, it is necessary to reposition the hand when moving to the new string.<sup>449</sup>

The two main approaches to hand movement when dealing with this exercise are the hybrid approach discussed in relation to Figure 3, and complete hand repositioning.

The hybrid approach translates directly to this exercise in which the right hand takes up a position where it can reach both strings with minimal positional movement.

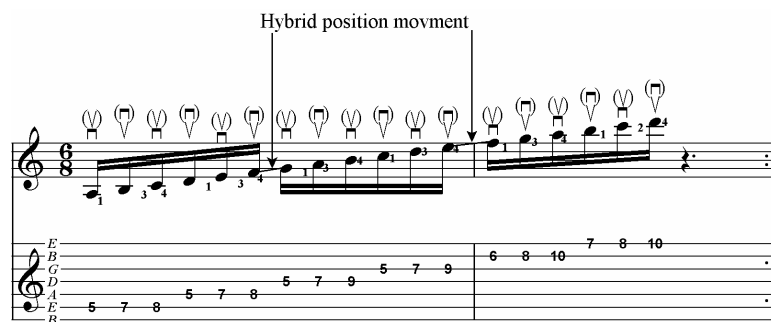
Unlike the hybrid position that covers multiple strings, repositioning the hand at every new string has a number of advantages. One such advantage is the consistency of tone and plectrum angle relative to the string created through the use of the same portion of the right hand palm.<sup>450</sup> Although this creates more movement, the improved consistency to both note duration and dynamics makes positional relocation every time a new string is played a valuable musical tool.

Figure 6 illustrates an application of the hybrid positional idea into scalar motion.

<sup>449</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>450</sup> Observed in Gambale, *Chop Builder, The Ultimate Guitar Workout*, 1994.

Figure 6



When applying hybrid positioning to a standard six-string, three-note-per-string scale, palm repositioning is minimized, reducing the risk of string noise through excessive right hand motion. By reducing palm repositioning to only twice in a six-string scale, the scalar elements naturally break into two string groupings. However, one of the disadvantages to such minimal right-hand movements is that when the motion does occur it is relatively large. Therefore, the larger motions can be cumbersome and increase the risk of incorrectly positioning the right hand.

Repositioning the right hand at every string also works in Figure 6. Although creating more positional movement, it has the advantage of smaller more accurate incremental movement. From an observational point of view the movement appears to be a continuous motion. This is especially true of the technique at increased tempi, as the string is dampened by the same target area on the palm.

### 6.3.4 Plectrum grip pressure and string dynamics

As string gauge alters incrementally throughout the figure, it can be necessary to adjust the plectrum grip pressure in proportion to this change. By decreasing the strength with which the string is struck relative to the string gauge, a consistent string dynamic can be attained.



Due to the aggressive attack that alternate-picking provides, string dynamics can play a more active role than they do in sweep-picking. In sweep-picking it is much easier to retain a standard depth that the pick attains when striking the strings. However, in alternate-picking increased wrist movement is utilized with more inertia which increases the probability that the string will be struck with either too much or too little force. This can occur for a number of reasons such as anticipation of the plectrum hand movement or as part of an incorrect movement to another string. The first of these can create weak notes; the second, being part of the elbow movement, creates notes of extreme volume. Unless generated intentionally, both extremes represent undesirable dynamic effects and are inconsistent with the attainment of an even melodic line and a constant dynamic level.

#### **6.3.5 Micro elements summary**

Alternate-picking is more aggressive than sweep-picking largely due to the physical area required for the wrist to complete the plectrum motion. The challenge of producing notes of an even dynamic level whilst moving to adjacent strings can in turn create a number of choices that affect the overall flow of a passage.

One solution to the problem of adjacent string motion is referred to as the hybrid position; this is essentially the placement of the right hand between the two strings. This creates the opportunity for either string to be struck without the need to reposition the right hand. The effect is a reduction in right hand movement when applied to multiple-string scalar motifs. The second solution is to reposition the hand at every new string; although simplistic in nature, this creates nearly double the movement of the first solution.

Secondary to tone generation is the utilization of dampening in order to modify and focus the subsequent notes. Many factors such as timbral continuity, attack, note duration, string resonance and dynamic consistency are all reliant on correct string dampening.

## **6.4 Macro elements**

### **6.4.1 Introduction**

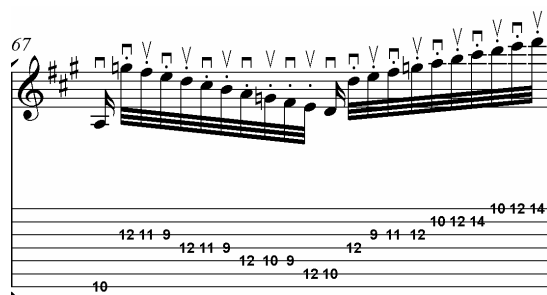
Many of the issues discussed prior to this point require practical application within the context of the *Caprices* in order to observe them in a usable format. The logical development of this technique requires its initial evolution to be conducted within the three-note-per-string static scalar framework, one of the most efficient forms. This requires minimal movement whilst maximizing the focus on the actual execution and tone quality of the notes. This idea is echoed in the scalar approaches throughout the transcriptions of the *Caprices* and has far-reaching ramifications for its future technical evolution within other musical genres.

### **6.4.2 Static position scalar development**

Figure 7 illustrates alternate-picking in both the ascending and descending scalar form providing the initial point to proceed with its development.

Figure 7

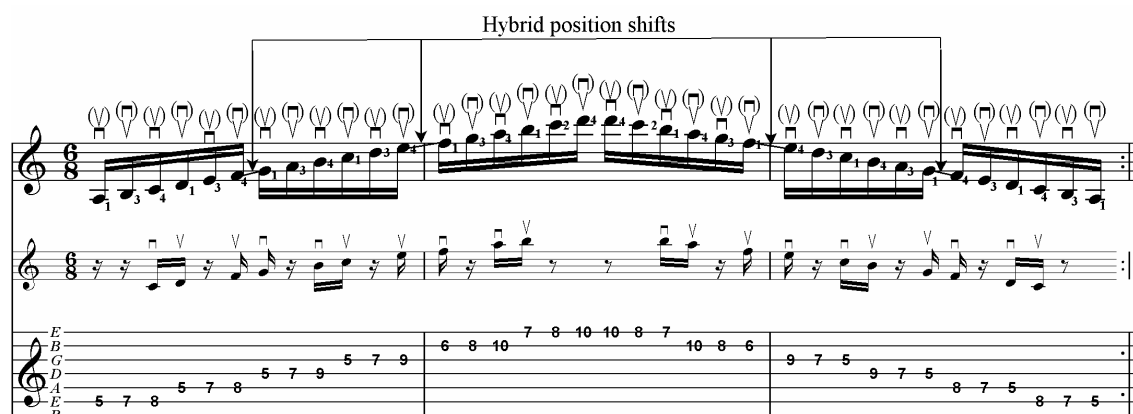
‘Caprice No. 7’, bar 67



Within this figure all the aforementioned factors are visible; scalar motion in both ascending and descending forms, three-note-per-string diatonic material and strict alternate-picking. The essence of this musical phrase can be extrapolated and expanded into a musical exercise with a less musical but more logical symmetrical form. This will provide an opportunity to address problem areas that could otherwise be approached only on a cursory level. This principle is especially true when learning techniques from music rather than the application of techniques to music.

Figure 8 illustrates the extrapolated exercise with alternate-picking strokes and bracketed alternatives which give the exercise the lateral coverage needed for alternate-picking development. The coverage includes the four alternate-picking strokes when moving to the adjacent string: the ascending up-stroke and down-stroke; and the descending up-stroke and down-stroke.

Figure 8



Alternate-picking can be broken down into groups of two; the up-stroke and the down-stroke, that, when applied to three-note-per-string scales, creates an alternating adjacent string stroke. The consistently alternating adjacent string stroke is shown more clearly in the *ossia* staff which picks out only string crossing notes. From the perspective of right hand repositioning, the *ossia* staff illustrates which plectrum strokes must be synchronized with right hand position shifts.

The hybrid position shifts four times with each movement immediately preceding a two-string grouping. In this format, where the movement occurs every two strings, it does so on the same plectrum stroke: in the ascending version two down-strokes and in the descending version two up-strokes, making it easier to synchronize. In contrast, when repositioning the hand after every string, co-ordination between the movement and the plectrum stroke are consistently alternating.

The two strokes on the top note at the directional turnaround point retain the rhythmic impetus whilst remaining within the parameters of strict alternate-picking. This rhythmic

device can be used to link two static positions together whilst retaining a clear rhythmic framework.<sup>451</sup>

## 6.5 Cyclic Rotation

### 6.5.1 Introduction

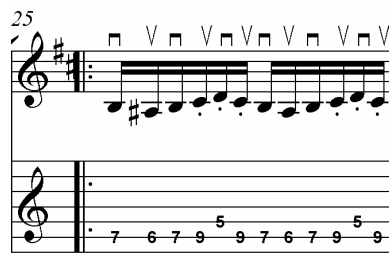
The term cyclic rotation refers to a continually repeated pattern akin to an ostinato.<sup>452</sup>

This type of ostinato also helps to develop one of the most important attributes, stamina, alongside overall consistency of execution.<sup>453</sup> These attributes are needed for the faster and more technically demanding sections of the *Caprices* such as string-skipping.

Both Figures 9 and 10 are extracts from ‘Caprice No. 24’ that exhibit similar melodic material and alternate-picking usage; these fit into the cyclic rotation format when consistently repeated. Figure 9 provides a contrasting single-line melody whilst Figure 10 is utilized as a variation on the main theme.

Figure 9

‘Caprice No. 20’, bar 25



<sup>451</sup> Gilbert, *Intense Rock*, 1988.

<sup>452</sup> MacAlpine, *Guitar Lessons*, 1990.

<sup>453</sup> *Ibid*

Figure 10

‘Caprice No. 24’ variation 2, bar 25

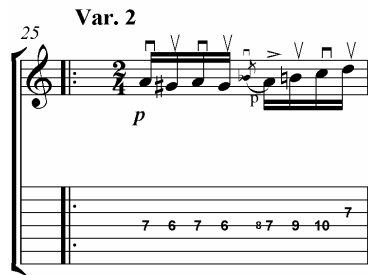
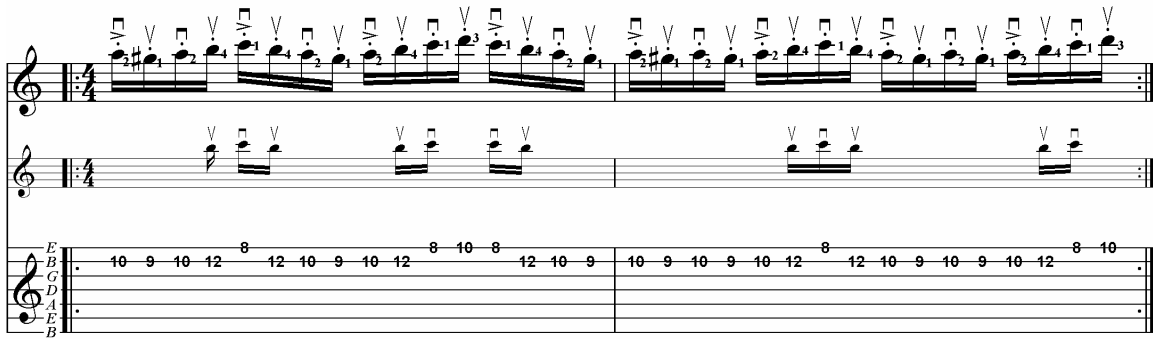


Figure 11 is an extrapolation of the previous two exercises utilizing a leading note to tonic idea prevalent within the single-note melodies of the *Caprices*.

Figure 11



From a technical standpoint, the exercise expands upon the adjacent string motion concept and is much less uniform than a normal exercise. Within this exercise, movement to the adjacent string occurs on both strong and weak beats in the bar. This creates an inefficient right-hand motion which moves in a contrary direction to the subsequent target string. This is best seen on the *ossia* staff, where the movement immediately preceding the C on the adjacent string is an up-stroke reminiscent of the adjacent string motion illustrated in Figure 9.

*Staccato* has been added to all the notes in order to develop the ability to dampen the higher strings reasonably heavily.<sup>454</sup> This has the effect of smoothing out the attack envelope whilst still allowing the notes to sound clearly.<sup>455</sup> Moreover, it aids the development of the subtle dampening often required for the higher flat-wound strings. Mastering this technique can be problematic owing to the need to use minimal string contact in order to avoid completely “choking” the note yet allowing enough contact to subtly control the note envelope.<sup>456</sup>

### 6.5.2 Symmetrical adjacent string access

Figure 12

When approaching such a figure, there are technical concerns that need to be addressed. One such concern revolves around the peripheral notes on both adjacent strings which are consistently at risk of being struck incorrectly. The F on the G string is most at risk being

<sup>455</sup> Observed in Lee Marcello, *Lee Marcello*, Seattle: R.E.H. Publications Inc., 1991.

<sup>457</sup> Observed in Gilbert, *Intense Rock* 2, 1991.

struck with an up-stroke moving in a contrary direction to the subsequent note.<sup>458</sup> In contrast, the note appearing on the top string is struck with a motion that can be continued towards the subsequent note on the B string.<sup>459</sup>

When viewed in isolation, beginning with either an up or a down-stroke determines which adjacent string utilizes the more difficult motion. However, in reality it is important to be accustomed to all adjacent plectrum motions which in turn helps as more complex plectrum string movement arises.

### 6.5.3 Movement into and exiting the string

Figure 13 covers every contingency involving alternate-picking and adjacent string motion.

Figure 13

As has been the case previously, the *ossia* staff illustrates the adjacent string motion without peripheral notes. There are four types of adjacent string motion addressed.

<sup>458</sup> Petrucci, *Rock Discipline*, 1995.

<sup>459</sup> *Ibid*



Strings below and above the main string can be approached with either an up-stroke or a down-stroke.

A more in-depth analysis of this motion reveals each adjacent string movement can be broken into two parts; the movement into the string and the movement exiting the string. In order to examine the entry and exit point of each adjacent string motion<sup>460</sup> it is important to start with the note immediately preceding the motion and the one immediately after. Not surprisingly, in bars one and two the adjacent string motions both before and after mirror each other owing to the uniformity of position where they occur and the strict alternate-picking regime followed.<sup>461</sup> In bars three and four only single notes on the adjacent strings are played making the less economic movement in bar three more difficult to execute than its subsequent counterpart.

The previously discussed hybrid approach can be modified to be used effectively where either side of the initial string requires accessing. From a practical perspective, difficulty arises when too many right-hand repositioning motions are attempted in a short period of time. Notes on adjacent strings can fail to reach their full duration or be lacking adequate tone. This arises from the inability of the right hand to retain the correct plectrum angle during the shift. Utilizing the hybrid position for the first adjacent string motion and the right hand position shift of the second or vice versa can create reduced motion overall. Which technique to use and where it is applied can be a subjective decision dependent on whether motion to the lower or the upper adjacent string is preferable. Once this has

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<sup>460</sup> Petrucci, *Rock Discipline*, 1995.

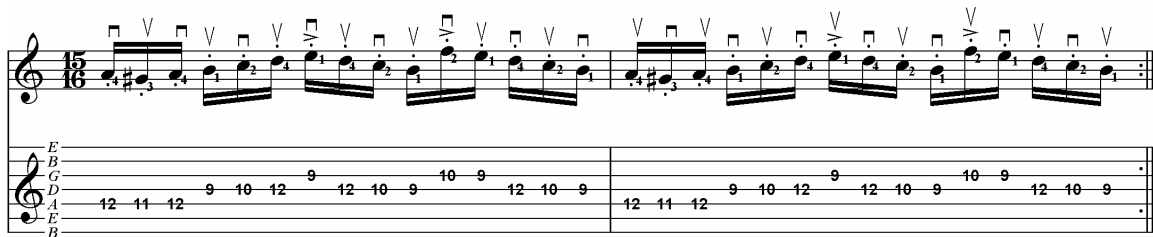
<sup>461</sup> Howe, *Hot Rock Licks*, 1989.

been determined the hybrid static motion can be reserved for the more difficult adjacent string.

#### 6.5.4 Plectrum rotation

Previously in the cyclic rotations, the number of notes on the peripheral strings was altered in order to provide alternating adjacent string motion. However, Figure 14 illustrates the opposite situation with the plectrum strokes themselves going through a rotational cycle every two bars whilst the notes remain exactly the same.

Figure 14



Due to the nature of the time signature and the number of notes per string, the plectrum pattern is reversed at the end of every bar.<sup>462</sup> This type of cyclic rotation develops a number of new technical avenues previously unexplored in this study. The constantly rotating adjacent string movement contrasts the previous method. It does so by employing a varying number of strokes on the adjacent strings to alter stroke motion.<sup>463</sup>

Both the highest and lowest notes can be used as synchronization points and therefore have been intentionally accented to provide a rotational reference point.<sup>464</sup> Of these accents, both are played on the same plectrum stroke; in bar one down-strokes are used and in bar two the accents arise on the up-stroke.<sup>465</sup> Due to the fact that all plectrum

<sup>462</sup> Howe, *Hot Rock Licks*, 1989.

<sup>463</sup> Observed in Romeo, *The Guitar Chapter*, 2000.

<sup>464</sup> *Ibid*

<sup>465</sup> *Ibid*

strokes are constantly rotating, accent points provide a stroke motion check<sup>466</sup> confirming the correct plectrum strokes are being adhered to.<sup>467</sup>

By rotating the plectrum strokes on the predominant string, the constant state of flux creates a less anticipated feel to the picking.<sup>468</sup> This in turn can help develop the ability to utilize alternate-picking spontaneously in any musical situation eliminating the need to work out plectrum strokes in advance.

### **6.5.5 Cyclic rotation summary**

In addition to developing stamina and coordination, cyclic motion provides valuable insight into retaining a correct plectrum angle relative to the string and its relationship to dampening.<sup>469</sup> This is especially true for single notes occurring on peripheral strings or those that require momentary repositioning which can place string tone and note duration at risk.

Within the cyclic ostinato, all variations of adjacent string motion, both upper and lower, can utilize the static position framework to develop the required movement necessary for further expansion. Although it is possible to create an infinite number of variations within this type of ostinato, the finite technical repertoire is comparably small. However, once developed, the alternate-picking adjacent string motion has far-reaching ramifications not the least of which is the basis for alternate-picking within the *Caprices*.

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<sup>466</sup> Petrucci, *Rock Discipline*, 1995.

<sup>467</sup> Gilbert, *Intense Rock 2*, 1991.

<sup>468</sup> Lane, *Power Licks*, 1989.

<sup>469</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

## 6.6 Linear motion

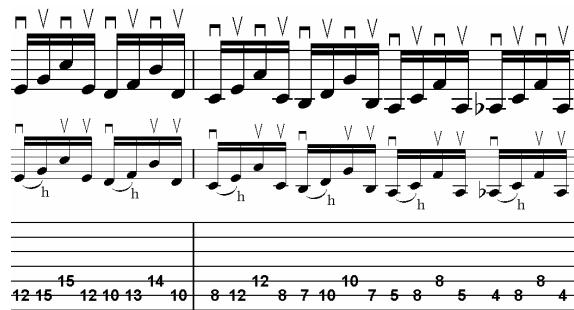
Up to this point, all alternate-picking motion has been focused on its development within a non-linear static position on the guitar neck. This provides an environment that allows both the technical and plectrum motions to be the sole focus, minimizing any variables that could be created through lefthand movement.<sup>470</sup>

### 6.6.1 Overlapping linear motion

The introduction of linear motion across the fingerboard within sequential patterns allows for prolongation<sup>471</sup> of one plectrum motion into multiple diatonic motifs. Figure 15 is a case in point; it illustrates the same plectrum pattern being used in a number of diatonic positions though lefthand linear motion.

Figure 15

‘Caprice No. 5’, bars 11-12



The linear motion that the sequential diatonic idea provides, expands exponentially depending on the number of shifts used. It also provides a valuable memory tool<sup>472</sup> with distinctive fingering patterns that relate to harmonic shifts<sup>473</sup> and can be utilized for modulation and melodic development.

<sup>470</sup> Lane, *Power Licks*, 1989.

<sup>471</sup> Howe, *Hot Rock Licks*, 1989. ; Gilbert, *Guitar Techniques*, 2006.

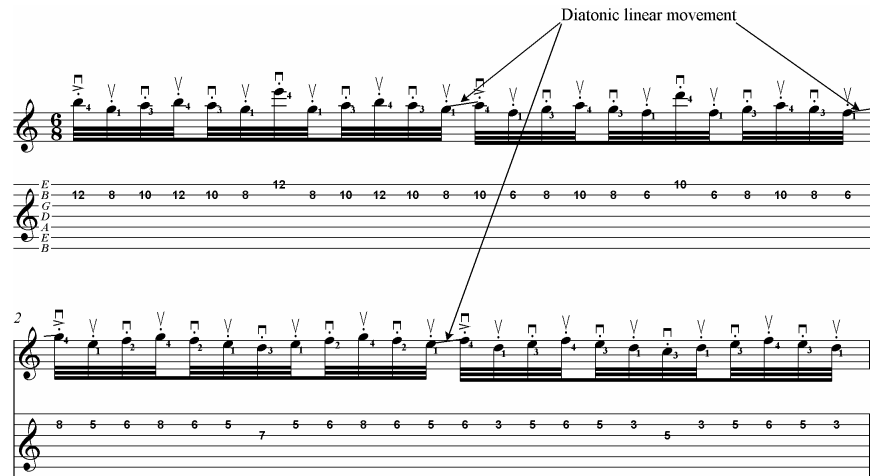
<sup>472</sup> Gilbert, *Intense Rock*, 1988.

<sup>473</sup> Observed in Howe, *Hot Rock Licks*, 1989.

### 6.6.2 Sequential movement

Figure 16 provides a solid launching point from which to begin the development of diatonic position movement in conjunction with alternate-picking and adjacent string motion.

Figure 16



One of the biggest advantages of the sequential movement is the replication of the plectrum patterns which have exact string tone duplication. The variable that requires consideration is that of changing string elasticity as the fingering pattern moves towards the headstock. Incremental changes in both plectrum and palm pressure can be required if constant tone and dynamic uniformity is to be achieved. Although these changes are extremely slight when dealing with overlapping diatonic sequential movement, larger movements can require much more radical changes. An initial awareness of these changes begins at this fundamental stage, however, the goal is the development of an intuitive ability to relate positional motion to plectrum pressure changes, dampening, and string elasticity.

Due to the nature of the guitar, diatonic linear movement eliminates extremely complex fingerings that can occur within the static position framework. The complexity of

executing fingering and adjacent string motion from such an undertaking can require much lengthy development for minimum technical intrinsic value.

There are three physical linear movements, each coinciding with an accented down-stroke, with the fourth finger utilized as the anchor for the new position. All proceeding notes are placed relative to this transitional finger with each subsequent position beginning on the second note of its previous counterpart. This method of using a transitional finger to locate the new position is as effective here as it is in sweep-picking.

Another advantage of this type of motion is the incremental physical movement from one position of the fingerboard to another, making it an ideal transitional tool, a case in point being Figure 15 where incremental movement from the 15<sup>th</sup> fret finishes on the 4<sup>th</sup> fret in the short space of a bar and a half. This can contribute to the rapidity of arpeggio-based motion where the ratio of shifts per note is higher. This is in stark contrast to the ratio found in conjunction with Figure 16.

### **6.6.3 Alternately-picked arpeggiation**

The regularity in which alternately-picked arpeggios appear within the *Caprices* requires that the technique be further developed. Although the more common five-, six-, and seven-string static position arpeggios have been dealt with within the context of sweep-picking, they are not limited to this form. Alternate-picking, in conjunction with both adjacent string motion and linear motion, occupies its own technical niche, providing unique string voicings and dynamic tone possibilities.

Figure 17 illustrates alternately-picked arpeggios that include multiple linear movements with both primary and secondary transitional points.

Figure 17

The figure displays two musical staves, each with a treble clef and a key signature of one sharp (F#). The top staff is labeled 'Primary transitional points' and the bottom staff is labeled 'Secondary transitional points'. Both staves show a sequence of notes with arrows indicating 'Outside Picking' and 'Inside Picking'. Below each staff is a fretboard diagram with fingerings (1-4) and a sequence of fret numbers (5, 3, 7, 7, 5, 9, 10, 8, 12, 8, 10, 9, 5, 7, 7, 3, 5, 8, 7, 7, 10, 9, 10, 13, 12, 13, 10, 9, 10, 7, 7, 8). The fretboard diagrams include a 'f.b.' (finger bend) marking at the 7th fret.

When examining the primary transition points, the symmetrical fingerings and uniform movement become immediately apparent. Each grouping of three notes is repeated in successive octaves making its memorization relatively simple.

Although the linear motion is the same in both bars (being a major second and minor third respectively) the transitional finger alternates from the second to the first finger.

The minor third movement is more difficult to execute from the perspective of relative position placement as it requires a larger motion from a non-overlapping position.<sup>474</sup>

However, the symmetrical nature of the triadic figures makes memorization a

<sup>474</sup> Observed in Gilbert. *Intense Rock*, 1988.

combination of two factors; learning the initial triadic shape<sup>475</sup> and its associated linear movement.

Synchronization between plectrum strokes and linear motion is similar in form to Figure 14 in which each grouping begins on the opposite stroke to its previous counterpart. Each bar represents one complete cycle at the end of which the initial plectrum stroke is reversed. The arpeggiation in Figure 17 decreases the notes per string ratio, making each grouping of three notes begin with a contrary motion plectrum stroke. This makes every second triadic figure end with the inefficient plectrum movement similar in principle to three-note-per-string plectrum motion.<sup>476</sup>

Through the utilization of the secondary transition points, right-hand motion is reduced by approximately 50%, requiring only four movements as opposed to eight. Consequentially, the larger shifts are less incremental in nature with an increased difficulty factor related to finger-barré integration and loss of symmetry.

These finger-barrés become increasingly difficult to use especially in bar two, where the second finger is responsible for three consecutive notes, two barréd and one as the transition. Although the contrary plectrum motion occurs on the second note of the finger-barré, the next note benefits with the plectrum hand playing the same string. This avoids the awkward motion of lifting the plectrum over the next string which would normally occur in a static position when notes are played on consecutive strings.

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<sup>475</sup> Observed in Gilbert. *Intense Rock*, 1988.

<sup>476</sup> Morse, 'My Personal Picking Exercise', p. 124.



Another difficult plectrum issue which is related to the contrary picking motion is “inside”<sup>477</sup> and “outside”<sup>478</sup> picking. Inside picking motion involves consecutive notes being played on the inside of the string; outside picking is the exact opposite. For example, notes played on the D and G string with consecutive up and down strokes utilize inside picking with the reverse stroke pattern being termed outside picking. Inside picking from the viewpoint of space between the strings is constrictive in nature.<sup>479</sup> This can limit the motion range of the right hand creating tension.<sup>480</sup> Although outside picking motion is much easier for many guitar players<sup>481</sup> both motions occur within the technique of alternately-picked arpeggios.

The secondary transitional points represent one possible musical scenario. A combination of both primary and secondary is also possible in addition to many other incremental solutions.

With so many variables, however, Figure 17 provides a fundamental platform from which to develop many of the essential tools needed for linear movement involving low note per string ratios. Figure 18 is one such contextual example of the aforementioned concepts which exhibits many similarities in form to Figure 17.

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<sup>477</sup> Petrucci, *Rock Discipline*, 1995.

<sup>478</sup> Gilbert, *Guitar Techniques*, 2006.

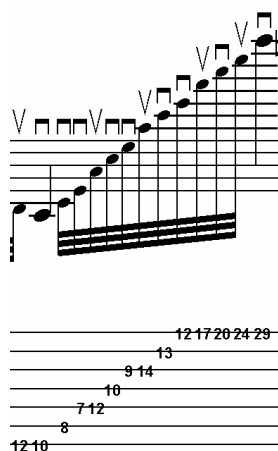
<sup>479</sup> Petrucci, *Rock Discipline*, 1995.

<sup>480</sup> *Ibid*

<sup>481</sup> Gilbert, *Guitar Techniques*, 2006.

Figure 18

‘Caprice No. 5’, bar 2



In this case incremental motion from one harmonic area on the fingerboard to another is a useful by-product of the arpeggiated linear motion; this is especially true considering the note range.

#### 6.6.4 Non-overlapping adjacent string linear motion

The diatonic-seventh chords illustrated in Figure 19 utilize alternately-picked linear transitions within a rudimentary sequential framework whilst expanding the idea of symmetrical fingering patterns.

Figure 19

To this point, alternately-picked arpeggios have been focused on the more symmetrical two-string approach found throughout the *Caprices*. However, in order to expand the arpeggio form to encompass three strings, the diatonic seventh note can be included. The added note increases the right-hand motion by a further 25%, which, although played with the more economic up-stroke, requires a constantly fluid motion.<sup>482</sup> By utilizing light plectrum pressure in conjunction with light to medium amounts of dampening the fluid motion can be achieved. This in turn promotes a relaxed palm dampening style that can be repositioned more readily.<sup>483</sup> Heavy dampening and its associated release and reapplication can make fast agile motions much more problematic, especially when a low note per string ratio is present.

Positional linear motion takes place on the first note of every beat with the root of the chord being immediately identified as the tonal center. The second finger functions as

<sup>482</sup> Lane, *Power Licks*, 1989.

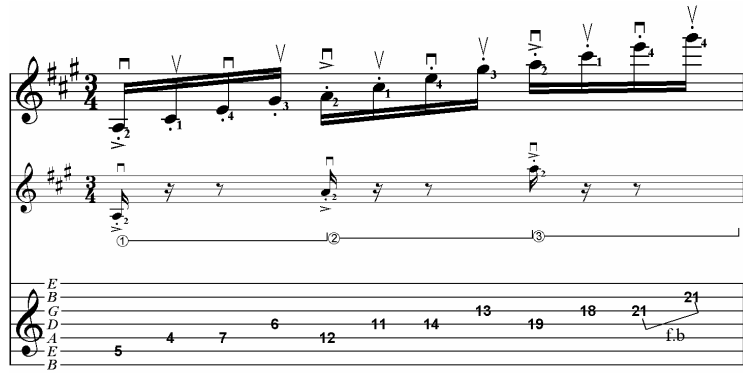
<sup>483</sup> *Ibid*

the transitional finger almost exclusively. However, the exception to this is the G sharp diminished seventh chord where transitional finger substitution occurs from the second finger to third and back.

Although only a semitone apart, the arpeggios of Dmaj7 and C sharp maj7 are played on different string groupings requiring a non-overlapping positional motion. Relative positional motion and finger placement is also more difficult at this point as it is more likely to require a visual reference than the other major second movement. The non-overlapping quality of the motion requires the second finger to swap to the adjacent string below whilst simultaneously traversing a major third up the fingerboard. The simultaneous nature of this movement should appear quick and fluid. There is a danger that an unintentional pull-off motion can occur when removing the first finger from the D string. The light to medium dampening discussed in the previous paragraph can now be more specifically defined as that needed to prevent extraneous string noise during the shift. The amount of dampening, therefore, is dependent on the individual's ability to move between adjacent strings with a minimum amount of string noise.

Returning to the concept established in Figure 19 of a non-overlapping adjacent string linear motion, Figure 20 illustrates how this idea can be applied to the major-seventh chord.

Figure 20



Due to the tuning of the electric guitar, the linear shifts are more extreme than anything previously encountered in this chapter. The now familiar symmetrical three-string groupings require the transitional finger to move seven frets at a time to the adjacent string in an ascending sequence. The byproduct of developing the ability to execute such large incremental linear motion is the extreme physical range that can be covered on the guitar neck through the different octaves.

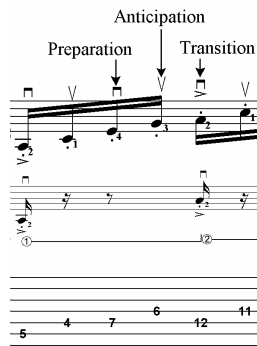
With *staccato* dampening and even string tone still of fundamental concern, the importance of synchronization is paramount, especially at the larger transitional points. It is at these points that note duration is most at risk, necessitating the need for the *ossia* staff which exhibits the transitional finger movement that requires independent familiarization.

There are a number of methods for this kind of extreme movement, one of the more orthodox of which is the instantaneous movement of the hand from one position to the next. This has many advantages and applications, an important one of which is that it requires no anticipation or preparation, thus making it ideal for smaller linear movements.

### 6.6.5 Preparation, anticipation and transition

The second and more complex method requires anticipation of the position shift by the entire arm. Figure 21 illustrates this, showing how it can be divided into three distinct movements best described as preparation, anticipation and transition.

Figure 21



The principle behind this idea is extremely simple with many players evolving the technique unconsciously<sup>484</sup> to combat large position movements. A rough comparison is to that of a whipping motion, carried out by the arm prior to and during the positional movement.

The preparation involves the left arm being lifted slightly in the opposite direction of the subsequent motion, in this case on the note. During the anticipation, the arm moves in the same direction as the subsequent transition in order to gain momentum for the impending position shift. When used in conjunction with the momentum already in progress from the anticipation note the transition should be relatively straight forward.

In order to break down each motion into its fundamental form, preparation, anticipation and transition, a threenote illustration has been used. However, preparation and

<sup>484</sup> A conclusion drawn from the observation of numerous sources of instructional footage, in which only occasional vague references were made to this technique.

anticipation can span any number of notes dependent on tempo, the number of frets moved and the note per string ratio. The size of the transition is the factor that influences the length of preparation time required. Bigger transitions that require more momentum and longer preparation time can span a larger number of notes whilst the transitional motion remains relatively constant.

Throughout this entire arm movement there should be no change in the actual fretting of the notes and more importantly the actual note durations should remain unchanged. As lifting the arm can have the undesirable effect of inadvertently lifting the fingers off the fingerboard it is important to be even more vigilant at these points.

One final point about this technique needs to be made with regard to the kinetic energy in the movement, both at the transition point and immediately after. With so much kinetic energy in the left arm it is important that care is taken to not allow a positional overrun. One method of avoiding this is to increase the pressure on the thumb against the neck at the correct time. This effectively pinches the transitional finger and the thumb together against the neck stopping the motion at the new target area on the finger-board.

Although only mentioned in conjunction with technical aspects and alternate-picking, this concept has far-reaching applications throughout all linear shifts. Many of the linear motions that occur within the *Caprices* can benefit through at least partial use of this technique owing to their speed and need for relative finger placement. Its subjective nature makes its successful utilization as a tool solely dependent on the individual's application of it in any given musical context.

Returning to Figure 20, the finger-barré on the last two notes is the only symmetrical digression from the established fingering pattern. Irrespective of this, relative finger placement can be applied to all three positions as they span the same four-fret spacing.

A relationship has been defined between fingering and linear movement which parallels the association between linear motion and plectrum pressure. As larger non-overlapping position movements are expanded it is important to note that larger plectrum pressure alterations can be required in order to retain a continuity of tone. The larger leaps in effect shorten the length of the strings considerably, in addition to the change in both string groupings and string gauges. Therefore, each large linear shift has an associated relative plectrum pressure analogous to the relative finger placement concept. With larger sized leaps, plectrum pressure alterations should also change accordingly. The pressure change must occur both intuitively and simultaneously as the position transitions are taking place.

#### **6.6.6 Scalic non-overlapping adjacent string motion**

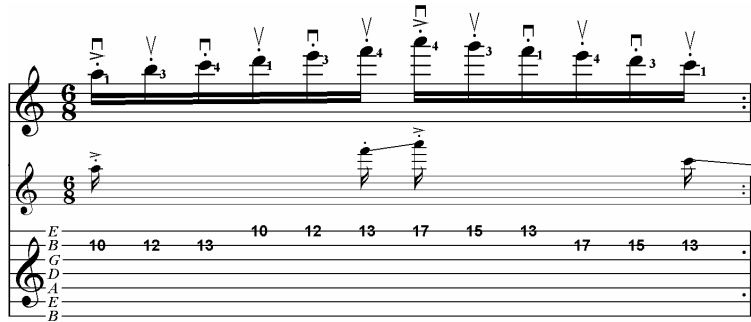
Non-overlapping sequential adjacent transitions are not exclusively the domain of arpeggios. The higher density ratio of notes per string that scalic style motifs provide require further development if it is to be of use within the *Caprices*. To this end, the fundamental platform provided by Figure 16 is ideally suited. However, in order to develop the versatility of the technique further, an increase in the number of shifts per note ratio is required.

The result of such a combination of variables can be seen in Figure 22, which illustrates a linear position shift of a third. This interval is the smallest, non-overlapping, three-note-



per-string shift that provides a good fundamental point from which to become accustomed to the motion.

Figure 22



Due to the symmetrical nature of this exercise each position starts with the same accented down-stroke making it the focal synchronization point. Consequently, the adjacent string motion crossover points are played with an up-stroke with the only fret common to both positions being the 13<sup>th</sup>.

The fourth finger provides the sliding major third transition in the ascending version with the first finger providing it in the descending version. Although alternating transitional fingers is not a new concept, it can cause initial confusion when combined with larger transitional motion within such a small grouping.

In order to grasp the full potential of linear motion provided by this technique its expansion to include larger shifts, as illustrated in Figure 23, is necessary.

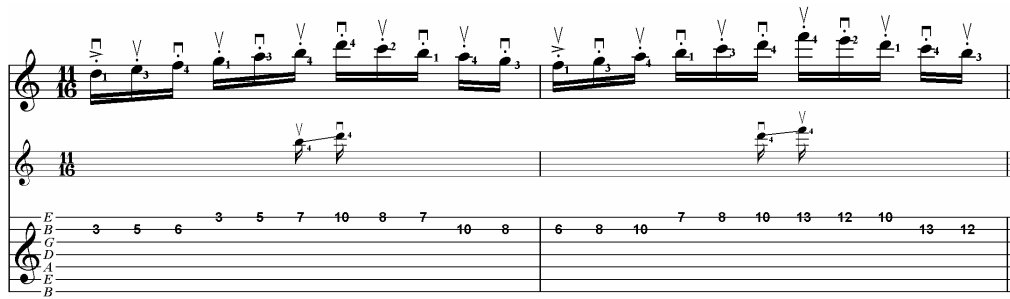
Figure 23

The musical score for Figure 23 is divided into two systems. Each system contains three staves: a treble clef staff with a 6/8 time signature, a bass clef staff, and an 'ossia' staff. The first system shows a sequence of notes with fingerings (1-4) and a descending fourth interval. The second system shows a sequence of notes with fingerings (1-4) and a descending fourth interval. The 'ossia' staff shows fingerings for each note.

The *ossia* staff shows all the transitional points and their corresponding fingers in addition to the descending fourth interval where note duration is most at risk. The alternating transitional finger, in combination with the alternating linear interval, makes this the next step in the development of linear motion. Using the *ossia* staff it is possible to focus solely on the isolated position shifts before the addition of the peripheral scalar material.

The symmetrical plectrum strokes and linear shifts are not indicative of a naturally occurring musical context within the *Caprices*. It is more realistic, therefore, to prepare for all adjacent string motion and transitional point combinations. Figure 24 does this by retaining a consistently alternating plectrum pattern whilst changing the number of notes per bar.

Figure 24



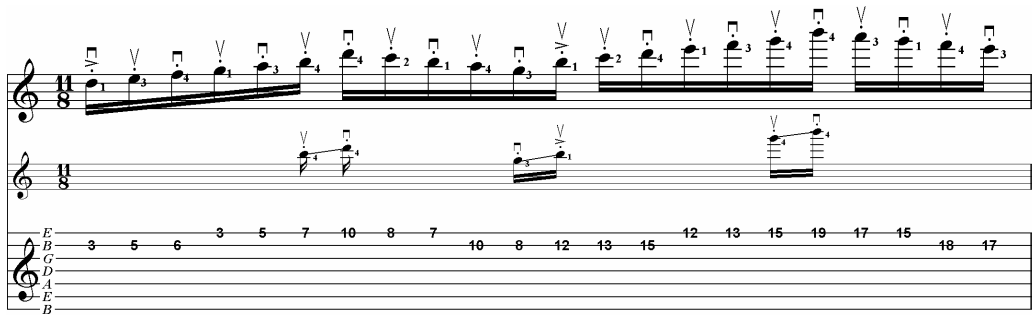
By changing the number of notes per bar to an odd number (in this case eleven), it is possible to produce an alternating rotational cycle which develops non-symmetrical transition points. This aids the ability to move in a linear fashion to non-overlapping positions on either an up-stroke or a down-stroke. Retaining a strict alternating pattern requires each bar to begin with an alternating accent, similar in theory to the rotational alternation created in Figure 14.

With the exception of plectrum strokes in Figure 14, string symmetry has been relatively predictable when used in conjunction with adjacent string motion and linear shifts.

However, in Figure 24 the entire plectrum pattern is reversed in the second bar, requiring linear movement to be synchronized to alternating plectrum strokes. Although appearing more random in nature this type of symmetrical and non-symmetrical adjacent string motion occurs throughout the *Caprices*.

Figure 25 illustrates the final evolution of this technique and includes multiple transitions over non-overlapping linear shifts on parallel strings.

Figure 25



In previous exercises, the linear shifts on the lower strings have only been used in descending patterns; in this exercise, the linear shift on both strings move in an ascending direction. In comparison to Figure 24 there is a marked increase in the shifts per note ratio with the cycling plectrum stroke occurring with greater frequency.

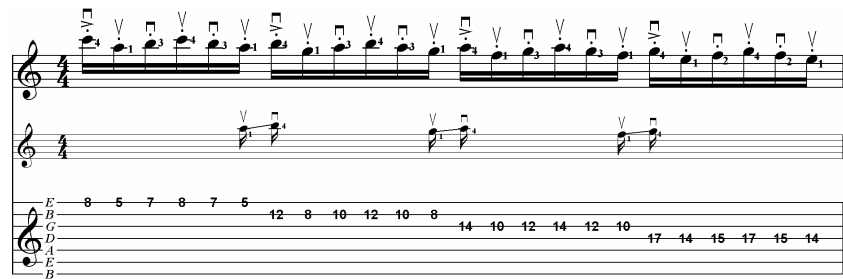
From the standpoint of synchronization, an increased frequency of shifts creates the same movement on each string. Plectrum motion on the high E string is an up-down-stroke whilst the B string pattern is down-up. This provides a point of reference from which plectrum strokes can be synchronized with position shifts.<sup>485</sup>

Lacking the strict three-note-per-string concept provides the middle position shift with the need to alternate the transitional finger from the third to the first. Although more difficult than using one finger in a sliding transition, the ability to swap fingers has numerous practical applications within linear motion in general.

Further enhancing the technical development necessitates the revisiting of the sequential idea, a concept used throughout the *Caprices*. Figure 26 utilizes the unique tuning of the guitar to incorporate previously developed tools with a diagonal linear motion.

<sup>485</sup> Gilbert, *Intense Rock 2*, 1991.

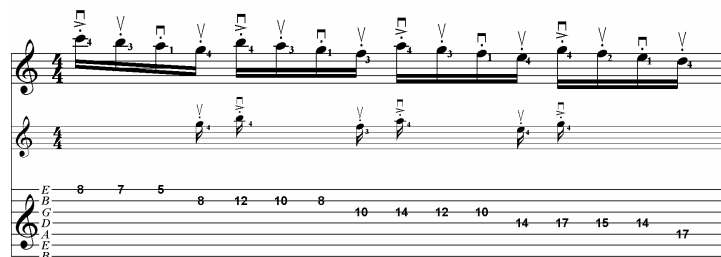
Figure 26



This sequential pattern promotes a physical motion normally associated with ascending melodic material whilst using descending scalar motifs in non-overlapping linear movement.<sup>486</sup> The transitional finger motion is similar in form and position to that of Figure 25, with the difference being the movement to the adjacent string is on the same plectrum stroke.

In order for this technique to evolve, the notes per position shift need to decrease, illustrated here in Figure 27 with the notes per shift dropping from six to four.

Figure 27



This type of sequential idea, a stock device in tonal music, creates a less conventional left hand movement. The technique can be used to access incrementally different harmonic areas on the guitar neck.

<sup>486</sup> Lane, *Power Licks*, 1989.

One major advantage of playing this kind of sequential pattern with large linear shifts is the elimination of intricate plectrum motion between adjacent strings. When playing Figure 26 and Figure 27 in a static position, the plectrum complexity can be extreme, creating string-skipping in the longer sequences necessitating intricate inside and outside picking movements. Using this technique attains a similar result as Figure 16 with a diagonal movement contrary to the direction of the melodic material.

The development of this motion locks the plectrum hand into only one adjacent string movement per linear shift. This in effect minimizes the danger of string noise whilst allowing the right hand to traverse the strings in the same direction as the melody line.

#### **6.6.7 Linear motion adjacent string summary**

Pure adjacent string motion in conjunction with alternate-picking creates many transitional options that occur throughout the *Caprices*. From a scalar perspective, notes per shift ratio are relatively high with transitional points located on both the upper and lower adjacent strings. At this point, plectrum stroke motion has developed with both alternating and repetitive patterns. Due to the multitude of combinations that can occur, movement to the adjacent string on any transition requires familiarization with the combination motion of either an up-stroke or down-stroke.

With the introduction of arpeggios, however, this ratio of notes per linear shift drops dramatically creating increased left hand movements. These include the overlapping and non-overlapping positions which are regularly used as transitional tools to move from one harmonic area to another within the *Caprices*.

With the introduction of sequential elements, the scope of linear motion is further expanded. The resulting development allows diagonal incremental access to different harmonic areas on the finger-board whilst minimizing the risk of excess string noise.

## 6.7 Linear motion, sequences, and arpeggios

To this point all string motion within the alternate-picking parameters has focused on adjacent string movement and its various combinations as they relate to the *Caprices*. However, with the basic tools of alternately-picked arpeggios, as established previously, the introduction of the sequential idea requires the arpeggio notes to be played in different note sequencing figurations.<sup>487</sup>

### 6.7.1 Note sequencing

Figures 28 and 29 illustrate a simple and more complex note sequencing idea, both of which draw on an alternate-picking convention established in Figure 17. Whilst Figure 28 demonstrates simple two plectrum strokes per note, Figure 29 utilizes a multifaceted sequential pattern which introduces string-skipping at a fundamental level.

Figure 28

‘Caprice No. 16’, bar 27



<sup>487</sup> Petrucci, *Rock Discipline*, 1995.

Figure 29

‘Caprice No. 16’, bar 36

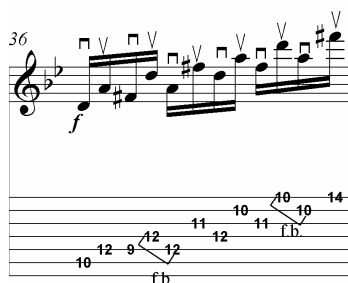
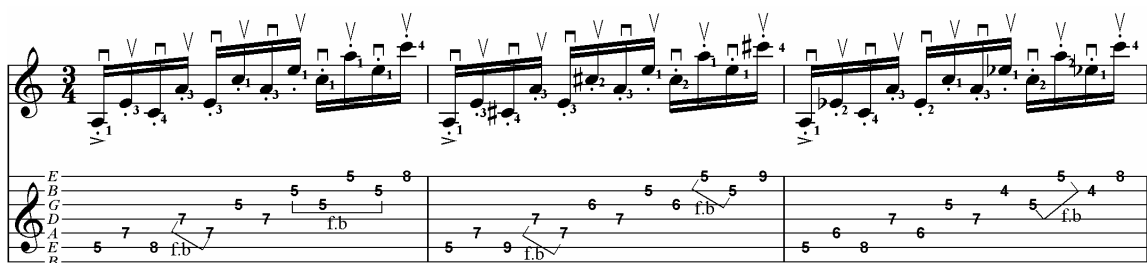


Figure 30, illustrates the three main triadic figures, minor, major, and diminished, using the same note sequencing idea seen in Figure 29.

Figure 30

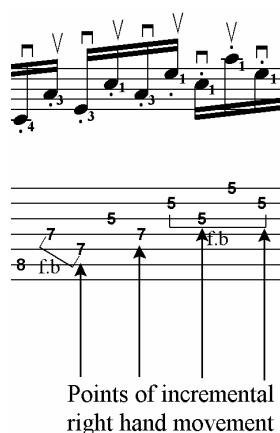


As similar shapes have been dealt with in the sweep-picking chapter, the focus is on the issues created by note sequencing in conjunction with alternate-picking, one of the most fundamental being string-skipping.

Throughout all three arpeggios there is only one string that is skipped, which provides a focal point for the positioning of the right hand. Figure 31 presents a cross-section of the isolated string-skipping portion of the A minor arpeggio. This illustrates how the two movements can be divided with each skip immediately followed by a simple adjacent string movement.



Figure 31



The middle point is represented by the skipped string, the notes either side of which can be reached without a change of position; this is similar to the hybrid positioning concept. The plectrum strokes at the string-skipping point move in an optimal fashion towards the next picked note facilitating what can be described as an “outside to outside” plectrum motion.<sup>488</sup> It is at this point that the hand requires repositioning in order to achieve the next string-skipped interval with the same relative plectrum angle and dampening.<sup>489</sup>

Although string-skipping takes place, the actual incremental motion is similar to that of simple adjacent string movement. However, the motion is executed by utilizing the wrist in the right hand,<sup>490</sup> as opposed to hand repositioning, which is a common technique in string-skipping.

### 6.7.2 Reordering the fingering

In order to simplify the ascending and descending versions of the same arpeggio, the same fingerings and finger-barrés have been retained. However, the note sequencing aspect allows the guitarist ample time to eliminate the use of finger-barrés by continually

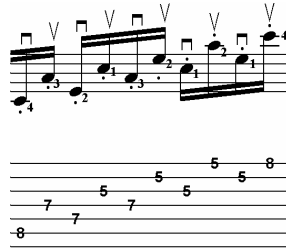
<sup>488</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>489</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>490</sup> Meola, Al Di. *Picking Techniques*. Milwaukee: Hal Leonard Publishing Corporation, 1987, p. 10.

reordering the fingering. Figure 32 illustrates this concept utilizing exactly the same notes and sequential pattern as Figure 31.

Figure 32



One of the big advantages of utilizing this method of reordering the fingering is the elimination of note differentiation difficulties which occur with a finger barré. This specific exercise contains a grouping of four notes all of which occupy the same finger-barré on the fifth fret. By rocking the finger a certain degree of note differentiation can be achieved.<sup>491</sup> However, the more complex the repetitive sequential note pattern is, the more difficult it becomes to prevent certain notes over-running others creating a “blurred” effect.<sup>492</sup> With each note individually fingered, note differentiation is relatively simple, as is note duration and *staccato* phrasing. One of the obvious disadvantages of this technique is the loss of fingering economy that results from using finger-barrés. The increased finger movement in the left hand is directly proportional to the speed at which the arpeggios can be played. This factor limits the technical usefulness to less demanding tempi; the upper tempo limit being dependent on the individual’s level of technical development.

Another factor which impacts on the use of this technique is the importance that *staccato* articulation plays in the melody line. The faster the arpeggio is played the more the

<sup>491</sup> Observed in Bouillet, *Improvisation for Progressive Hard Rock Guitar*, 1989.

<sup>492</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

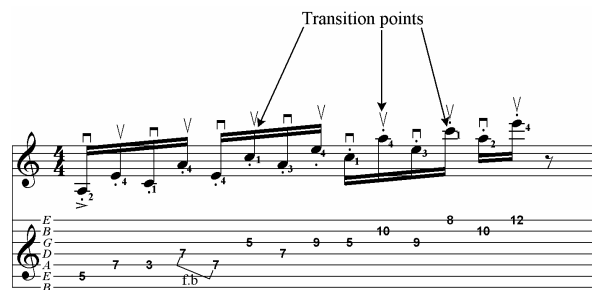
finger-barred version increases in its usefulness; with note differentiation at extreme tempi more difficult to discern.

As the string-skipping element of the arpeggio utilizes adjacent incremental string motion,<sup>493</sup> it provides an ideal starting point to familiarize oneself with the motion. It is this fundamental form that provides the basis for the larger arpeggiated skips that follow.

### 6.7.3 Non-overlapping linear motion

Figure 33 illustrates the next obvious evolution of this technique drawing on elements of transition, sequence, non-overlapping linear motion and string-skipping.

Figure 33



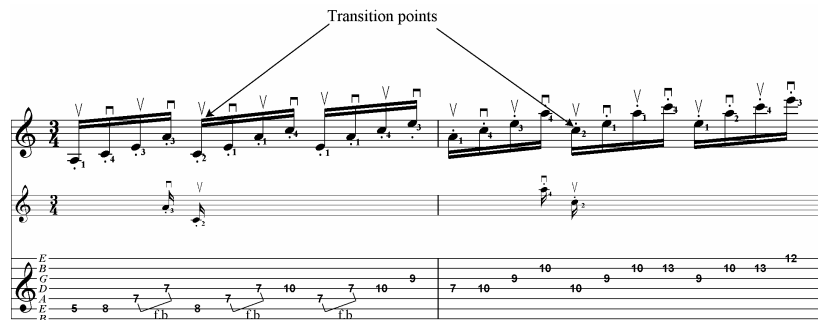
Unlike many of the previous transitions that involve moving the same finger to the new position, this figure requires an exchange of fingers at each transition point. In addition, transition points are synchronized to an up-stroke in a non-symmetrical fashion, all of which occurs either immediately after adjacent string motion or string-skipping. This, in combination with consistent outside picking,<sup>494</sup> creates a situation where the dampening part of the palm can spend undesirable amounts of time out of contact with the strings.

<sup>493</sup> Observed in Romeo, *The Guitar Chapter*, 2000.

<sup>494</sup> Gilbert, *Guitar Techniques*, 2006.

With the palm requiring regular repositioning and pronounced movement the correct plectrum angle relative to the string can easily be overlooked. With this in mind, Figure 34 integrates a sequential note pattern introduced in Figure 27, into the arpeggio pattern minimizing the number of transitions. The amount of time that the dampening part of the right hand is detached from the strings is consequently minimized.

Figure 34

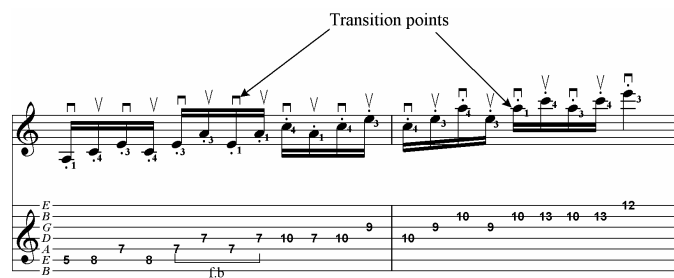


The plectrum stroke pattern in Figure 33 is based around a single root note followed by the third and fifth on the adjacent string. However, Figure 34 is the exact opposite with the root and third occupying the same string with the fifth on the adjacent string. This, in combination with an up-stroke on the initial note, introduces an uneconomic plectrum motion that has been largely avoided up until this point. This culminates in the plectrum stroke prior to each adjacent or string-skipped motion occurring in the opposite direction to that of the new string. The fundamental difference between this and Figure 33 is the need to lift the plectrum back over the already struck string to the new string. Although extremely uneconomic, the development of this skill is necessitated by its appearance throughout the *Caprices*, especially in combination with linear movement. The more difficult areas of the exercise occur where the string-skip coincides with a plectrum motion contrary to that of the subsequent string (clearly seen in the *ossia* staff). Although only one string is being skipped, the plectrum in reality is essentially lifted over two strings as it is followed immediately by another contrary motion to the adjacent string.

This must be done whilst avoiding inadvertently striking the two strings that the plectrum is being lifted over.<sup>495</sup> This skill is needed as it forms the fundamental cornerstone for future development of the string-skipping technique.

Figure 35 is a triplet sequential pattern and, as with the three-note-per-string scales, adjacent string motion alternates between economic and uneconomic plectrum strokes.

Figure 35



By inserting the sequential pattern into the same frets as in Figure 34 it is possible to compare the individual fingerings, plectrum strokes and their differences.

While from a transitional perspective, the linear motion occurs at different points, it is the plectrum stroke comparison that requires more attention due to the fact that the triplet sequences are shorter; no string-skipping occurs as it does in Figure 34. This also makes incremental motion to the new adjacent string area occur more rapidly. A solidly anchored right-hand position can, therefore, only occur where a number of notes are grouped on one string, the remainder of the time the hand is continually moving.

#### 6.7.4 String-skipping alternate-picking in a static position

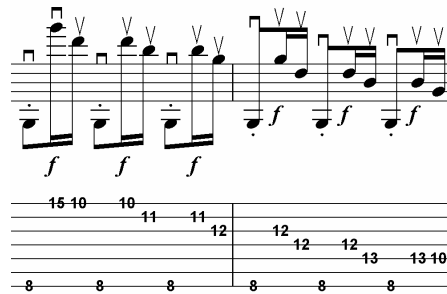
Figure 34 introduces the concept of string-skipping within a traditional broken chord fingering pattern which provides a more open intervallic sound.<sup>496</sup> However, string-

<sup>495</sup> Observed in Gilbert, *Guitar Techniques*, 2006.

skipping can occur in a multitude of different forms from that encountered in ‘Caprice No. 1’ (heavily based on sweep-picking string-skipping) to the extreme seven-string skips of ‘Caprice No. 16’ (Figure 36).<sup>497</sup>

Figure 36

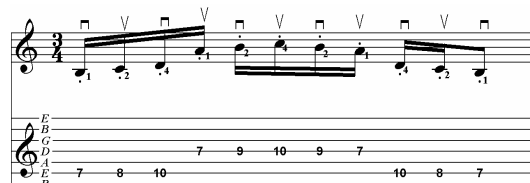
‘Caprice No. 16’, bars 50-51



As was mentioned at its introduction, the hybrid method of note location eventually becomes less frequently used, developing instead in conjunction with left-hand repositioning. Future technical development reflects this, focusing on full hand relocation techniques and its development issues.

An essential part of string-skipping is correct string location with the fundamental static position scalar form providing an advantageous starting point. Figure 37 illustrates this focusing solely on string location issues utilizing a single-string skip.<sup>498</sup>

Figure 37



<sup>496</sup> Steve Morse, *The Complete Styles*. New York: D.I.C. Publication, 1991. p. 5.

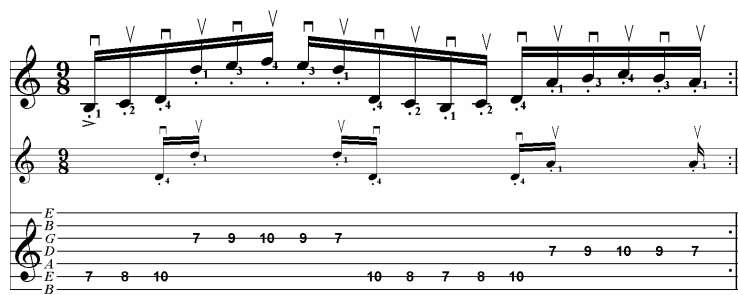
<sup>497</sup> Similar in principle to those observed in Richie Kotzen, *Rock Chops*, Seattle: R.E.H. Publications Inc., 1990.

<sup>498</sup> Observed in Marcello, *Lee Marcello*, 1991.

The basic plectrum pattern can be viewed as a variation of Figure 5 the difference being the actual skip on the A string. The goal is the development of a fluid wrist motion that maintains uniform string tone and dampening pressure<sup>499</sup> and this is largely dependent on retaining the correct plectrum angle relative to the string. The right-hand position requires duplication on both strings; it demands simultaneous arm and elbow movement in conjunction with a wrist motion.<sup>500</sup> The arm and the elbow deliver the wrist to the new position with the wrist moving the plectrum over the subsequent string, striking it with an up-stroke.

Once the motion for a single skip and its transitions has been developed the next progression is to utilize single skips to different strings. Figure 38 illustrates an example of alternating single and double string skips.<sup>501</sup>

Figure 38



The goal is the accurate instinctive location of the right-hand position with the only tone inconsistency being produced by the changing string gauge. For this to occur, the notes on the E string need to be used as the base from which other string-skipping motion is gauged. Utilizing a base system allows other variables to be measured in relation to this one string. In this case, the base string is fixed due to the repetitive note pattern,

<sup>499</sup> Observed in Gilbert, *Intense Rock 2*, 1991.

<sup>500</sup> Observed in Kotzen, *Rock Chops*, 1990.

<sup>501</sup> Observed in Marcello, *Lee Marcello*, 1991.

however, once multiple skips are introduced the base string can also alternate depending on the notes either side of it.

Skipping speed also alternates with the plectrum hand motion, needing to be faster for the bigger skips in order to maintain note duration integrity. This aspect also functions as a theoretical maximum in terms of tempo,<sup>502</sup> in effect limiting the overall speed of the piece of music to that of the largest string skip.

The incorporation of larger string-skipping motifs requires the plectrum pressure to be altered in order to retain overall continuity. This is similar in principle to the relationship between linear shifts and string gauge, the difference being a change in the gauge as opposed to the length of the string. The base system can aid in these plectrum pressure to string gauge ratio changes, the relative alterations being directly proportional to the base string. As string-skipping becomes more pronounced, more radical pressure changes can be needed the differentiation of which is helped when measured from a constant.

As plectrum pressure and palm dampening are not mutually exclusive an alteration in plectrum pressure requires a corresponding alteration in dampening. Alternately-picked string-skipping often encompasses the thinner gauged strings, which requires a noticeable alteration of the aforementioned factors to maintain a balanced string tone. In this particular case, less pressure is needed to dampen the flat-wound G string than its round-wound counterpart, the D string.<sup>503</sup> Figure 36 shows the possible extremes that can be

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<sup>502</sup> Gilbert, *Intense Rock 2*, 1991.

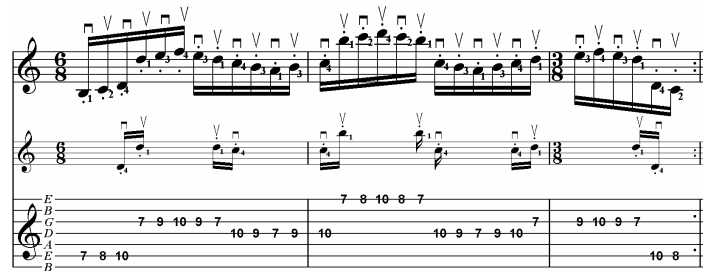
<sup>503</sup> The assumption being most guitar strings change from round to flat wound between the D and the G string respectively.



encountered and the extent to which plectrum pressure and dampening requires adjusting: note density per string is another important factor that impacts on this.

Figure 39 encompasses more strings into the string-skipping formula whilst retaining the same note per string density of Figure 38.

Figure 39



From the string-skipping perspective, the *ossia* staff clearly illustrates the skips that require a more extreme arm movement in combination with the wrist. The adjacent string motion functions as a middle point from which to prepare for the next four-string skip. At this point the adjacent string motion can utilize a hybrid position so as to anchor the hand whilst the arm prepares for the next string-skip movement. In effect, the new anchor point functions as a new base string from which to launch the next string skip much as it did in the previous figure. As string-skipping is largely dependent on relative positioning, the ability to alter the base string is a valuable tool which allows the figure to be viewed in two fundamental motions: the four string-skips and the adjacent string motion. At the end of the first adjacent string motion, the base string is reset and the same four-string-skip repeats itself.

In reality, nothing actually changes, only the relative perception of the initial string, the consequent string-skips and their related finger positions. In addition to aiding in the

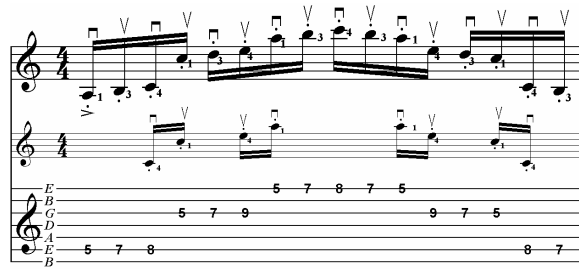
conceptual break down of the string-skipping portions, the changing relative base concept also provides a secondary checkpoint. Hand position, plectrum angle, and string dampening portion of the palm, need to mirror the original position on the initial string at the secondary point.

Hybrid positioning of the hand within the alternately-picked string-skipping technique is used to a minor extent where adjacent string motion is being utilized. Often a combination of hybrid and string-skipping relocation can be used to different degrees dependent on the situation. In this case, if a hybrid position is utilized between the G and D strings, relative string-skipping distances between the E and the G strings will be slightly different to that between the D and the E strings. Due to the fact that the high E string is at the outside extremities of the fingerboard, the tolerance for variation is less stringent. The difference in relative distance, therefore, is more easily adjusted to as it falls within normal variational parameters.

With the exception of the low B string, the full ranges of relative plectrum pressure changes within a static position are used. The largest alterations occur in relation to the four string-skips; the adjacent string movement and its related incremental pressure alterations are hardly noticeable.

Figure 40 takes the next step in the evolution of string-skipping alternate-picking through the increase of string-skips per note ratio.

Figure 40



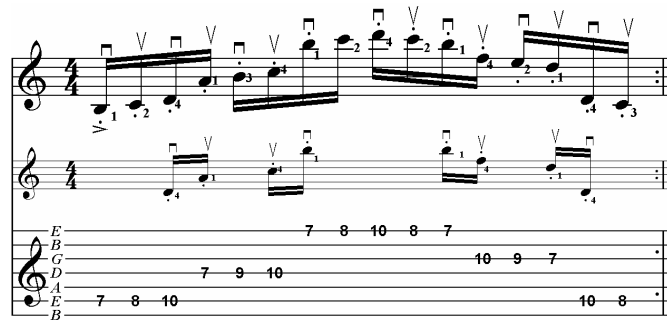
Unlike the previous musical example, there is no adjacent string motion in this example, shortening the time that the right hand spends on the middle string. Therefore, there is only a very short time to reposition the hand correctly at every skip, thus reducing the amount of time the right hand spends on any one string. Consequently, a light, fluid motion is required from the right hand in contrast to the more anchored approach demonstrated in the previous figure.

With the increased movement between strings, the relative string-skips from the base string must occur almost instantaneously. All the factors previously mentioned, such as dampening and plectrum pressure must also be modified more quickly.

In previous string-skipping exercises, the plectrum motion has been relatively efficient with movement to the subsequent string in the same direction as the plectrum strokes. However, the efficient strokes in this exercise occur on the four-string-skips whilst the strokes on the smaller skips are in the opposite direction to the subsequent string. Becoming accustomed to the opposite outside plectrum motion on the smaller skips allows the development and incorporation of this technique into larger skips.

So far string-skipping has utilized the same distances in both ascending and descending forms. Figure 41 introduces skips that vary between their ascending and descending patterns.

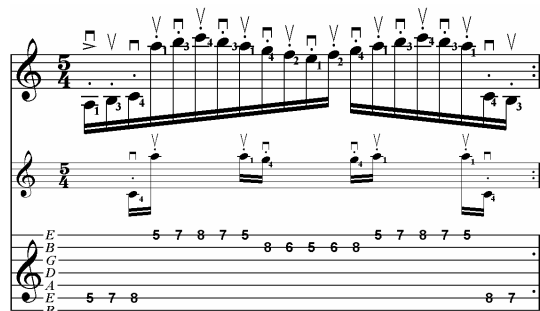
Figure 41



With the changing string-skipping pattern, the base string alternates between the low E string for the ascending part, and the high E in the descending part. These two strings are the point of reference (base string) from which subsequent skips are estimated. This in effect helps the guitarist to become accustomed to any continually alternating reference strings in conjunction with a constantly changing skip in both ascending and descending forms.

As shown in Figure 36, extreme six and seven-string-skips occur throughout the *Caprices*, making it imperative that the large skips are mastered. Figure 42 uses an already familiar scalar concept to introduce the six-string skip.

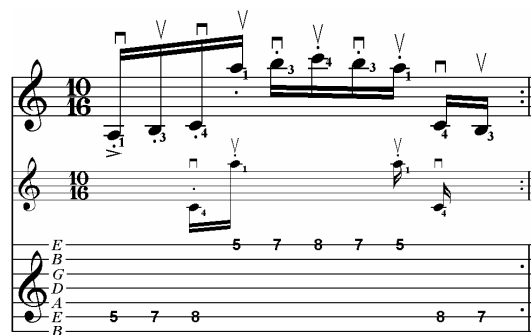
Figure 42



The large skips are extremely difficult to execute if the correct plectrum pattern towards the subsequent string is not used. The adjacent string motion allows for an anchoring and preparation period before the larger descending skips are attempted.

This kind of skip requires a more extreme movement in the arm that can result in incorrect placement immediately after the skip. The use of adjacent string motion on the high E string allows for the use of hybrid hand positioning, the importance of which lies in its variable parameters. Therefore, the large skip can be attempted from the slight “misplacement” of the right hand that hybrid positioning ultimately promotes. Once the relative distance between the strings can be ascertained intuitively, the use of both hybrid positions and adjacent string motion as a development and location apparatus can be eliminated. The resulting extreme string-skipping motion can be seen in Figure 43 where the scalar skips per note ratio are arguably at their most fundamental.

Figure 43



As incremental development of this point has been relatively small, the increased motion can be viewed as a simple modification of a three-note-per-string scalar pattern as illustrated in Figure 5. Due to the two-octave differential, both strings utilize the same fingering patterns, making focusing on the actual skip simpler.

As has been discussed, dampening and plectrum pressure are closely related. In this case, the change between the two strings is more extreme: the plectrum pressure and dampening therefore require increased adjustment, with the higher string needing a much lighter approach. With the exclusion of the lower B string, these extreme changes represent the outer limits within the framework of a static position.

## 6.8 String-skipping and linear shifts

Having addressed all the technical elements of string-skipping within a static position that arise in the *Caprices*, an examination of linear motion within the string-skipping parameters is required. Figure 44 shows two octaves of the same scalic idea in conjunction with linear movement. As this string-skipping motion utilizes the same fingering, it provides an ideal starting point.

Figure 44



Similar in nearly every aspect to Figure 37, the linear motion can be achieved by either completely relocating the left hand or using one thumb position for both areas.

The interval of a major second at this position on the neck is relatively small and can actually be performed with minimum movement of the thumb on the back of the neck.

The two distinct linear areas encompass a relatively small number of notes making this

method one of the most efficient. In order to access both positions on the neck the thumb is required to perform a pivoting motion.

There are a number of advantages that this method has over the total replacement and relocation concept, most importantly in the speed that the notes can be accessed. With only a pivoting of the thumb on the left hand, it is possible to access the new area on the fingerboard with virtually the same finger position relative to the strings. In theory, therefore, the new fingerboard area should be accessible at the same speed as the string-skip alone. This is possible by simultaneous movement of both the thumb pivot and string-skip motion.

Another advantage of the thumb pivoting method is the relative placement of the fingerings. Assuming the initial placement is correct, the amount of movement that the thumb requires in this position will be consistent, greatly reducing the chance of finger misplacement. Moreover, by removing the need for the entire hand to shift position, the possibility of relocating the thumb outside its optimal position is also eliminated.

### **6.8.1 Variable skips and the base string concept**

Figure 45 further develops the technique through the use of the base string idea using two alternating linear skips in conjunction with relative placement.

[illegible]

Figure 46 introduces a number of new issues by increasing the ratio per note of linear motion in conjunction with string-skipping.

[illegible]



Bar 1 uses a backward linear shift towards the headstock to gain the notes on the high E string creating the least economic plectrum motion on the larger skip. All three positions can utilize the same thumb pivoting as the previous exercise with the first and third thumb positions being similar irrespective of the string choice.

However, bar 2 reintroduces the non-overlapping lineal movement in the third octave being the same notes as bar 1 on a different string. Although the number of strings skipped is smaller, the overall linear transition is greater and requires a different thumb approach. Unlike the first bar, each grouping of notes requires the thumb to perform a corresponding incremental position shift. This eliminates the need for a large movement which occurs if the first two groupings are played with the same thumb position.

Plectrum pressure and dampening alterations also require adjustment, not exclusively for string gauge but also for the shorter string length that occurs on the B. Relative alterations need to be more radical than would normally occur for adjacent string motion in a static position.

Figure 47 further reduces the skips and the note ratio incorporating the six-string motion in combination with a descending sequential idea.

Figure 47

Main Incremental Incremental Incremental

Hybrid Hybrid Hybrid Hybrid

Second I I I I

H H H H

E 12 10 8 8 7 5 10 8 7 7 5 3

B 10 9 7 9 7 5 7 5 3

G 8 7 5 7 5 3 7 5 3

D 7 5 3 7 5 3 7 5 3

A 7 5 3 7 5 3 7 5 3

E 7 5 3 7 5 3 7 5 3

This type of descending melody line uses the high E as the base reference string. As a consequence of the initial stroke and melody contours, all of the plectrum strokes immediately prior to the string-skips are in a contrary direction to the subsequent notes. This makes the six string-skips much more arduous, increasing the chances of inadvertently striking a string in between the target notes. With the increased frequency of inter-string movement, relative skipping distances are more difficult to judge accurately, making precise thumb positioning essential.

A combination of incremental and hybrid thumb<sup>504</sup> positioning is needed, the latter helping to aid in the execution of the larger string-skipping sections. Hybrid placement of the thumb is used on the six-string-skips in order to provide an anchor point from which relative distance can be measured. In addition, minimal left hand movement at these points promotes a more thorough focus on the larger motion by reducing the number of variables that require consideration. The incremental shifts are limited to the smaller string-skipping distances where plectrum stroke motion and linear motion are most liable to achieve a successful result. As with many of these exercises there is no

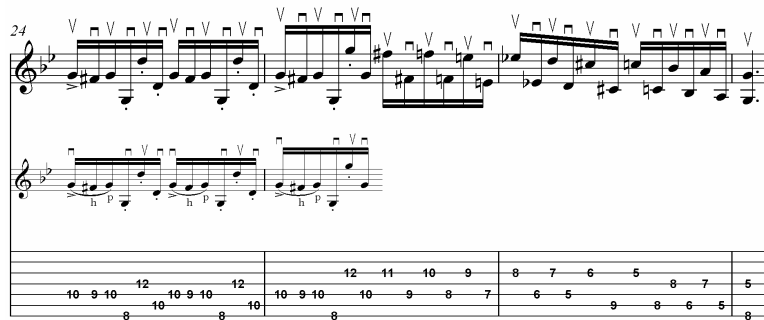
<sup>504</sup> Hybrid thumb position in this context refers to a thumb position that is used for two or more finger-board positions in the left hand.

absolute right way to perform the figure, which makes it necessary to provide two thumb motion options.

Figure 48 demonstrates a practical use of the tools developed in Figure 47 with a less extreme alternately-picked plectrum stroke pattern/linear movement combination.

Figure 48

‘Caprice No. 13’, bars 24-27



From a technical perspective, another of the aspects that this figure demonstrates introduces the next area of technique that requires development: pedal tones.<sup>505</sup>

## 6.9 Pedal tones and string-skipping

Both ‘Caprice No. 2’ and ‘Caprice No. 12’ make extensive use of alternate-picking in combination with pedal tones, creating a multitude of harmonic inversions with a distinctive sound.<sup>506</sup> This distinctiveness stems from the harmonic basis that the pedal tone provides in combination with the number of reiterations per bar.<sup>507</sup> In the case of the two aforementioned pieces, repetitions of the pedal tone generally arise every second stroke with the majority of the content being single-note melody.

<sup>505</sup> Moore, *Advanced Lead Guitar Techniques*, 1987. ; Lynch, *George Lynch*, 1990.

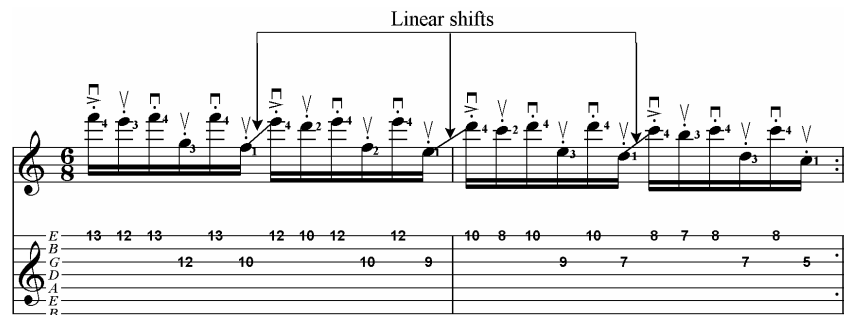
<sup>506</sup> *Ibid*

<sup>507</sup> Observed in Moore, *Advanced Lead Guitar Techniques*, 1987.

The harmonic reference note is established appearing both above and below the main melody. From a technical perspective this provides a unique challenge as it has the effect of lowering the notes per string ratio to 1:1 as in bars 25 and 26 of Figure 48.

Most of the string-skipping and linear motion discussed previously has been based around developing the string-skipping tools in a three-note-per-string format. However, lowering the note per string ratio facilitates the type of development needed to deal with the pedal tone idea as seen here in Figure 49.

Figure 49



One of the recurring motivic ideas in the *Caprices* is the neighbour note idea which is played using a variety of techniques. In the scalar form the fingers move one after another in either an ascending or descending motion. However, the repetitive nature of this technique dictates the main harmony or melody notes be continually reiterated as is the finger fretting that note.<sup>508</sup> Therefore, where the non-pedal tones occur physically on the fingerboard, influence which fingers are used to fret those notes.<sup>509</sup> In the case of Figure 49, the non-pedal notes' physical proximity are all below the pedal tone. This requires the fourth and third fingers to be more active than is usual in three-note-per-string scalar patterns.<sup>510</sup>

<sup>508</sup> Observed in Moore, *Advanced Lead Guitar Techniques*, 1987. ; Malmsteen, *Masters Series*, 1991.

<sup>509</sup> Observed in Marshall, *Yngwie Malmsteen's Style*, 1986.

<sup>510</sup> Observed in Moore, *Advanced Lead Guitar Techniques*, 1987.

In normal scalar patterns the first finger provides the anchoring role, often remaining on the fingerboard whilst the other fingers are placed relative to its position. However, this musical technique often requires a fourth finger to play the anchoring role.<sup>511</sup> The difference is that the notes occupying the same string, but lower in pitch can only be played when the finger in question is removed from the fingerboard.<sup>512</sup> This creates the need for an extremely strong and agile third and fourth finger, capable of prolonged repetitive motion over multiple strings.

The control of note duration benefits greatly from the removal and re-fretting of notes,<sup>513</sup> which, as a by-product, allows more control over lengths of *staccato*.<sup>514</sup> However, one of the obvious disadvantages is the limitation this places on tempo.<sup>515</sup> With so much increased interaction between neighbouring fingers, incorrect relative finger placement and string location can also create problems. Moreover, the increased chance of extraneous string noise created by incorrectly replacing the fingers and striking one of the neighbouring strings also exists. This can be minimized by retaining the fourth finger placement on the string. However, if the subsequent or previous note on the same string needs to be played<sup>516</sup> its removal is required.

### **6.9.1 Accessing pedal tones above and below the main string**

Figure 50 illustrates multiple sequential string-skips with both inside and outside plectrum motion.

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<sup>511</sup> Observed in Malmsteen, *Play Loud! The Second Movement, Arpeggios*, 1995.

<sup>512</sup> Observed in Moore, *Advanced Lead Guitar Techniques*, 1987.

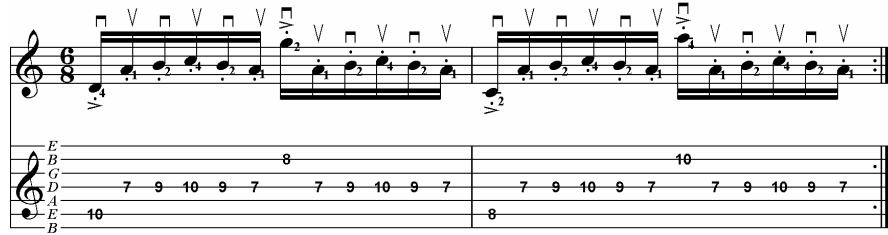
<sup>513</sup> Observed in Jordan, *Master Sessions*, 1993.

<sup>514</sup> Observed in Moore, *Advanced Lead Guitar Techniques*, 1987.

<sup>515</sup> Observed in Malmsteen, *Masters Series*, 1991.

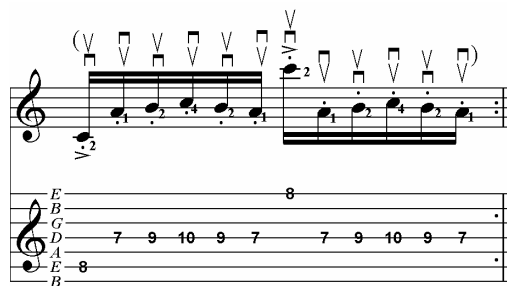
<sup>516</sup> Observed in Moore, *Advanced Lead Guitar Techniques*, 1987.

Figure 50



The difference between this example and Figure 13 is the string-skipping component, which requires development in order to progress past a scale-based idea. The initial plectrum stroke dictates which of the string-skips have the more difficult picking motion. In this case, the skips to the higher string are the more difficult; conversely, starting with an up-stroke places the harder, less physically-efficient skip on the lower strings. Therefore, the individual's preference can be catered for by simply reversing the initial stroke, a technique that can reduce the inefficiency of larger skips. For example, if the more efficient plectrum strokes occur on the larger skips, with the less efficient on the smaller skips, the overall motion is at its most economic (illustrated in Figure 51). When the initial movement is a down-stroke, the larger string-skips to the high C note exemplify an inefficient motion which can be remedied by beginning with an up-stroke. This effectively retains the parameters of alternate-picking and its string tone qualities whilst utilizing the more efficient plectrum motion on the larger of the two skips.

Figure 51



### 6.9.2 Pedal tones and finger-barrés

This concept and the string-skipping motion needed to access notes both above and below the main string are illustrated in Figure 50 which functions as the precursor to Figure 52.

Figure 52

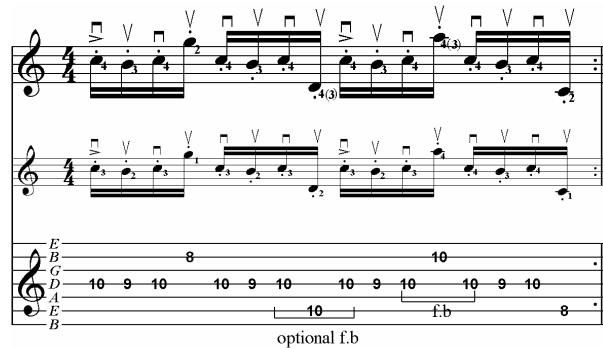


Figure 52 revisits the neighbour note idea, through a constantly changing string-skipping note which appears both above and below the primary string. Both of the skips are of equal distance with the less efficient stroke occurring on the lower string.

The optional finger-barré exposes a number of issues that require closer examination. Previously the fourth and third fingers have been limited to the neighbour note concept, remaining on the same string. However, within this exercise they cycle between pedal tones and melody notes requiring the third finger to perform the actual string-skipping motion, which can be difficult. The optional finger-barré eliminates the need for this kind of fingering motion which in itself requires correct placement on the first note of the barré.

Shown here in Figure 53, the preparation for laying the finger-barré occurs as the B note is being fretted. By positioning the fourth finger over the notes, all that remains to be

done once the B has reached its full duration is to depress the barré. This finger-barré differs in as much as both directions of the skip occur in succession, requiring all three notes under the barré to be cleanly fretted. In previous occasions the finger-barré has only covered consecutive notes in one direction.

Figure 53



The positioning of the finger-barrés is defined by the normal fretting part of the fourth finger being placed on the lower D with the rest of the finger being flattened out so as to cover the C.

Because of the inefficiency of the plectrum motion on the lower finger-barré, it is imperative to strike only the desired strings. This requires exact plectrum hand positioning in conjunction with the correct plectrum angle. However, the second finger-barré poses fewer difficulties due to a more efficient plectrum stroke motion.

As previously mentioned, third and fourth finger combinations can be extremely problematic due to the natural weakness.<sup>517</sup> The main staff provides the fingering to develop the required stamina, including bracketed finger options that remove the need for finger-barrés. These provide some new fingering challenges as the third finger skips over a string to fret a note on the same string as the fourth finger. Generally, major or minor

<sup>517</sup> Vinnie Moore, *Speed, Accuracy, and Articulation*, New York: Hot Licks Productions Inc., 1988.



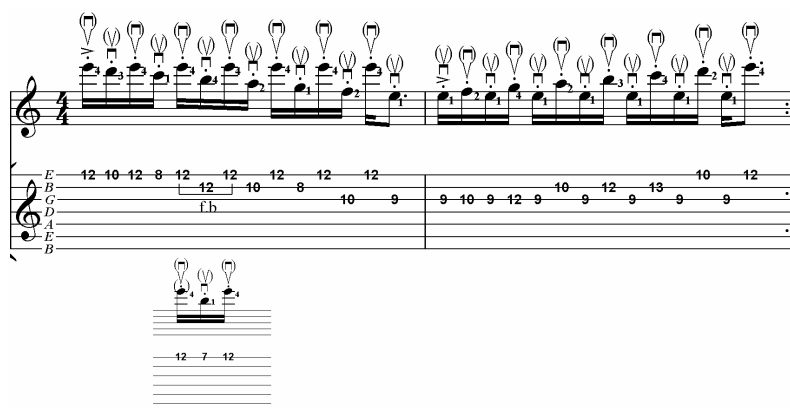
chord finger-barrés have the fingers ordered the opposite way round for comfort with the fourth below the third finger. However, due to the pedal tone arrangement, elimination of the finger-barré requires the third finger to appear both below and above the fourth finger on the same fret. This provides the first string-skip with a more comfortable “reaching over” motion than the second. The second requires the fourth finger placement to be closer to the bridge side of the fret. In this way, the placement of the fourth finger in no way impedes the positioning of the third finger under it; this is especially true if the fourth finger remains in an anchor position.

At this fundamental stage, the interaction between the third and fourth finger is largely optional with the finger-barré providing an easier alternative. However, as the pedal tone technique progresses with larger string-skipping in conjunction with alternate-picking, the finger-barré option becomes less viable. This is largely due to the physical restrictions of the larger skips and is especially true when pedal tone arpeggiation occurs.

### **6.9.3 Larger skips and 1:1 ratios**

As an intermediary development tool, the neighbour note concept serves to aid in the growth of alternate-picking in conjunction with pedal tones. However, the technical evolution needed to play the *Caprices*, requires a more concentrated one-to-one ratio with the pedal note (seen here in Figure 54).

Figure 54



As has been seen previously, choosing the correct initial stroke can often provide a tempo “ceiling”, one of the reasons why bars 1 and 2 both start with different strokes. If the pedal note is struck first, the initial stroke should be in the same direction as the subsequent melody notes. Bar 1 illustrates a descending melody with an initial up-stroke contrasting with bar 2 which begins with a down-stroke. This type of initial plectrum stroke in effect creates an “outside to outside”<sup>518</sup> picking motion which in the smaller string-skips can be played with a hybrid right-hand position.

Unlike the descending version, the first finger can retain its finger placement throughout with no impact on note duration. However, in the descending version, the fourth finger needs to be lifted off and replaced for the first two melody notes which place them at risk of being prematurely cut off. After all the notes occupying the same string have been played it can still be prudent (although not technically essential) to control duration of the pedal note by continuing to lift and replace it. As the string-skipping becomes more extreme, the melody notes can be far removed from the pedal tone in terms of physical proximity on the fingerboard. Therefore, the right-hand palm may require the extra control that the fretting finger can provide for note duration and string vibration.

<sup>518</sup> Gilbert, *Guitar Techniques*, 2006.

Figure 55 shows a six string pedal motif, which includes a raised leading note, scalar prolongation and changing pedal note. From the perspective of string tone, analogies can be drawn between this and the opening passage of ‘Caprice No. 2’.

Figure 55

The musical score for Figure 55 is presented in two systems. Each system contains a main staff and two lower staves. The main staff is in 4/4 time and features a complex melodic line with many accidentals and slurs. The two lower staves show fretting patterns for the strings, with numbers 1-12 indicating finger positions. The first system covers measures 1-4, and the second system covers measures 5-8. The lower staves are labeled with string names: E, B, G, D, A, B from top to bottom.

The main staff represents two different pedal notes and their fingering patterns within a static position. This creates a number of complex fingering interactions.

Previously, the melody notes have been exclusively below or above the pedal finger in terms of physical positioning on the fingerboard. However, bars 3 and 4 on the main staff introduce the concept of melodic material arising on both sides of the pedal note (played with the third finger). Due to the fact that only four notes above the pedal finger require fretting with a minimum stretch the third finger is preferable as the pedal finger. With the majority of melodic material occurring on or below the pedal tone fret, the larger skips are more easily achieved with the longer first and second fingers. The result

is that the fourth finger is assigned realistic fret string-skipping stretches. This avoids some of the more extreme fingering variations that are possible within this exercise.

Additionally, bracketed fingering occurs throughout for the express purpose of eliminating continually repeated fingerings. These are most prevalent in the *ossia* staff of bars 3 and 4. At these points either the bracketed or the main notated finger can be toggled in any desired order, eliminating fingering repetition that can become cumbersome. One of the fingering anomalies previously not encountered, to avoid fingering repetition, is the bracketed second finger in the fourth bar. Although, crossing fingers in this fashion can be beneficial, as in this case, it is usually limited to semitone motions. This is due to the larger intervals requiring extreme twisting of the wrist position which makes their practical use extremely limited.

As has been discussed, the finger-barrés are a problematic solution to performing notes several strings apart on the same fret. Their elimination, therefore, provides a further opportunity to develop the string-skipping interaction of the third and fourth fingers which extends the concept introduced in Figure 52. With the smaller fourth finger retaining its position at the top of the fingerboard, the longer third finger is free to execute the larger string-skips: from an ergonomic viewpoint, these fingerings are relatively comfortable. However, as the string-skips incrementally become more extreme, a slight motion in the left hand may be necessary towards the top of the fingerboard to prevent any incorrect note fretting. With the elimination of finger-barrés, a certain amount of finger crossing motion is required at these points. On these larger skips incorrect note fretting is most likely to occur. Additionally, the aforementioned

movement in the wrist could require further alteration in order to retain realistic optimum finger angle<sup>519</sup> the amount of which is subject to the physical attributes of the individual.

As has been discussed, sequential motion is best broached by utilizing linear shifts of which the *ossia* staff shown in bars 3 and 4 provides the linear alternative. The uniform pedal action of the fourth finger and its pivoting role established in the first two bars can also be retained.

Alternative plectrum strokes have not been offered because of their problematic application especially on the largest skips. From a practical playing perspective, only optimized plectrum motion will comprehensively cover the extreme string-skips in a 1:1 note per string ratio as it occurs both here and in the *Caprices*.

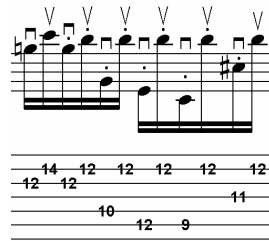
To this point, pedal tone melody has been restricted to scalar form to help develop a fundamental set of techniques required to progress. Figure 56 clearly illustrates one of many arpeggiated melody lines in conjunction with alternate-picking and pedal tones. This extract effectively lowers the ratio of melody notes per string.

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<sup>519</sup> Martin, *El Arte Flamenco De La Guitarra*, p. 22.

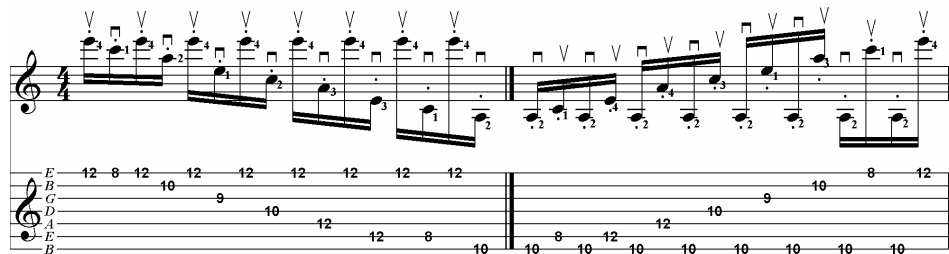
Figure 56

‘Caprice No. 2’, bar 21



While the above example clearly illustrates the need to expand upon the arpeggiated pedal tone idea, Figure 57 shows the next progression of the technique in both ascending and descending forms. The actual arpeggio shapes within the pedal tone technique are extrapolations of five-string and six-string sweep-picking versions that occur throughout the *Caprices*.

Figure 57



The nature of pedal tone arpeggiation on the electric guitar dictates that the majority of melody notes occur on different strings. This makes accurate note location more difficult, yet the highest priority. Moreover, it necessitates a more in-depth look into the plectrum motion of the right hand in conjunction with a modification of a hybrid positional concept.

#### 6.9.4 Hybrid positioning

Previously, right hand hybrid positioning has been utilized to bridge the gap between two positions before moving into the new position. However, successful execution of the

extreme string-skips presented in Figures 55-57 is more likely to succeed if a single right-hand position with the ability to access all necessary notes is used.

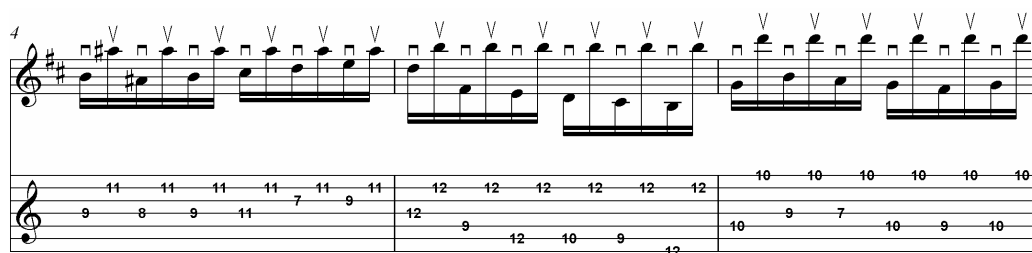
The correct hybrid hand position can be defined as a point between the outer peripheral notes where optimum plectrum angle relative to the string is achieved. Physical attributes and preferences notwithstanding, this mostly occurs close to or exactly on the middle string/s, in this case the D string. As the outer peripheral notes define the position where the optimum plectrum angle occurs, they are continually being redefined dependent on the musical context. Therefore, in situations where a good deal of pedal tone motion occurs it can be necessary to reposition the palm slightly in order to achieve this continuing advantage. Where the redefining of the middle string occurs' is extremely subjective and depends on a balance of tone quality, ergonomic comfort and the ability to attain the objective notes.

With the optimum plectrum point being a virtual construct, melody notes that are not exactly at this point can be problematic in tone quality. This can be especially significant for notes on the outer peripherals. To minimize this, therefore, it is often prudent to alter the plectrum angle slightly with the fingers holding the pick. With one hand position servicing so many strings, certain compromises in plectrum angles and string tone are necessary.

Figure 58 illustrates an example of palm repositioning within the *Caprices* in which it differs in range and scope of movement.

Figure 58

‘Caprice No. 2’, bars 4-6



As this excerpt shows, changing the pedal string in bars 5 and 6 and lower peripheral notes throughout, require slight alterations in the overall right-hand position at the beginning of each bar. This raises an important issue: how many notes on the string, especially in the melody, does it take to redefine a hand position? In bar 5, one note appears on the lower B string; taking this into account means that the right-hand position is anchored further towards this string. Although the majority of notes occur between the E and the B strings, one note can influence plectrum position for an entire bar if taken into account. This leaves two options excluding that note when calculating the overall positioning of the palm or dividing the bar into two different positions. Although the latter solution appears ideal, increased motion within a bar can be problematic in terms of note location especially at faster tempi.

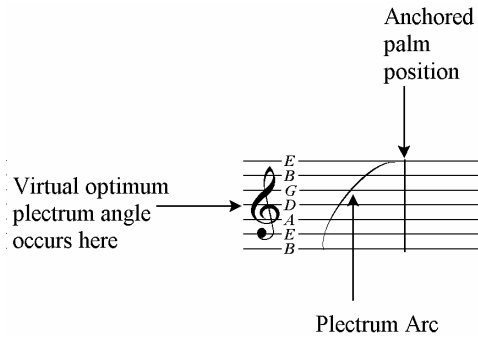
An extremely agile wrist motion is needed to strike all the notes whilst in a single hand position.<sup>520</sup> The by-product of a stationary position, however, is the inability of the wrist to strike all the strings in the same position relative to the bridge. Working from the premise that the plectrum is held between the thumb and first two fingers, a plectrum arc is created, as illustrated in the graphic representation of Figure 59. This arc is a result of

<sup>520</sup> Meola, *Masters Series*, 1991.



the twisting of the wrist to accommodate all the notes in the seven-string pedal tone exercise such as 57.

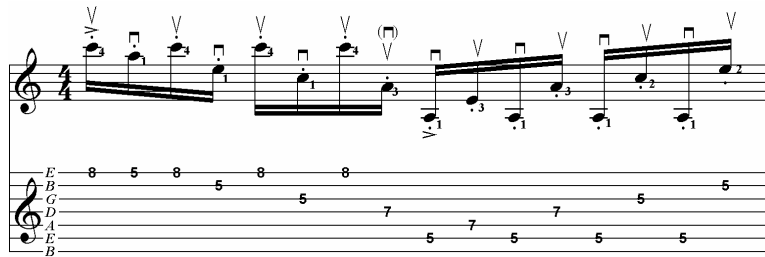
Figure 59



### 6.9.5 Orchestrating optimized plectrum motion

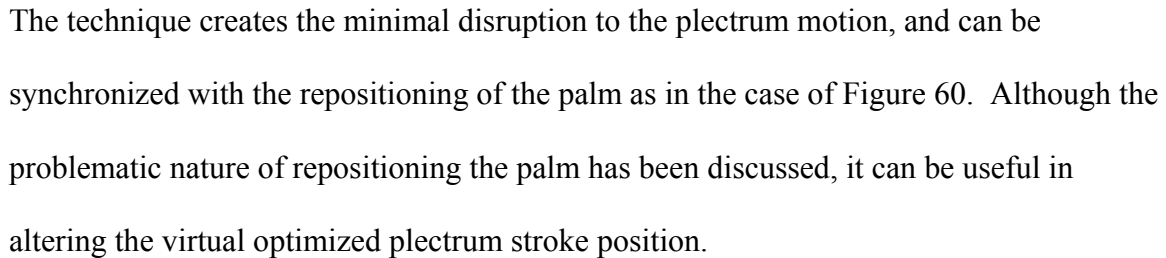
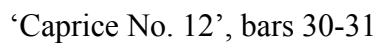
Figure 60 introduces the concept of changing the pedal note from the high E string to the low E string. Both ‘Caprice No. 2 and 12’ feature pedal tones both below and above the melody, demonstrating the need to develop the ability to toggle between both.

Figure 60



Changing between the two pedal tones presents the problem of preserving the optimal plectrum motion in the right hand. This is done through the use of a sweep-picking motion immediately prior to the changeover by substituting an up-stroke for the down-stroke on the A note (the original stroke bracketed in the above exercise). This method of preserving optimal alternate plectrum motion is used throughout the *Caprices* although most obviously in the aforementioned examples illustrated below (Figures 61-62).

‘Caprice No. 2’, bars 38-39



In the ascending second half of the bar, finger-barrés have been replaced by an interaction between the first and second finger playing different strings that occupy the same fret. This specific fingering can create a twisting of the wrist to accommodate the second finger. One possible solution is to arch the first finger (in order to minimize twisting) and accommodate the second finger beneath it.

### 6.9.6 Pedal tones and linear motion

Figure 63 introduces the concept of a linear shift to the pedal tone. This reduces both the incremental melody note movement and time spent on the pedal tone.

Figure 63

diatonic linear motion points

The musical notation for diatonic linear motion points in 4/4 time is as follows:

**Measure 1:**

**Treble Clef:**

- Beat 1: Quarter note G4, quarter note A4, quarter note B4, quarter note C5. Motion points: G4 to A4 (up), A4 to B4 (up), B4 to C5 (up).
- Beat 2: Quarter note D5, quarter note E5, quarter note F#5, quarter note G5. Motion points: D5 to E5 (up), E5 to F#5 (up), F#5 to G5 (up).
- Beat 3: Quarter note F#5, quarter note E5, quarter note D5, quarter note C5. Motion points: F#5 to E5 (down), E5 to D5 (down), D5 to C5 (down).
- Beat 4: Quarter note B4, quarter note A4, quarter note G4, quarter note F#4. Motion points: B4 to A4 (down), A4 to G4 (down), G4 to F#4 (down).

**Bass Clef:**

- Beat 1: Quarter note F#3, quarter note E3, quarter note D3, quarter note C3. Motion points: F#3 to E3 (down), E3 to D3 (down), D3 to C3 (down).
- Beat 2: Quarter note B2, quarter note A2, quarter note G2, quarter note F#2. Motion points: B2 to A2 (down), A2 to G2 (down), G2 to F#2 (down).
- Beat 3: Quarter note E3, quarter note D3, quarter note C3, quarter note B2. Motion points: E3 to D3 (down), D3 to C3 (down), C3 to B2 (down).
- Beat 4: Quarter note A2, quarter note G2, quarter note F#2, quarter note E2. Motion points: A2 to G2 (down), G2 to F#2 (down), F#2 to E2 (down).

**Measure 2:**

**Treble Clef:**

- Beat 1: Quarter note D5, quarter note E5, quarter note F#5, quarter note G5. Motion points: D5 to E5 (up), E5 to F#5 (up), F#5 to G5 (up).
- Beat 2: Quarter note A5, quarter note B5, quarter note C6, quarter note B5. Motion points: A5 to B5 (up), B5 to C6 (up), C6 to B5 (down).
- Beat 3: Quarter note A5, quarter note G5, quarter note F#5, quarter note E5. Motion points: A5 to G5 (down), G5 to F#5 (down), F#5 to E5 (down).
- Beat 4: Quarter note D5, quarter note C5, quarter note B4, quarter note A4. Motion points: D5 to C5 (down), C5 to B4 (down), B4 to A4 (down).

**Bass Clef:**

- Beat 1: Quarter note F#3, quarter note E3, quarter note D3, quarter note C3. Motion points: F#3 to E3 (down), E3 to D3 (down), D3 to C3 (down).
- Beat 2: Quarter note B2, quarter note A2, quarter note G2, quarter note F#2. Motion points: B2 to A2 (down), A2 to G2 (down), G2 to F#2 (down).
- Beat 3: Quarter note E3, quarter note D3, quarter note C3, quarter note B2. Motion points: E3 to D3 (down), D3 to C3 (down), C3 to B2 (down).
- Beat 4: Quarter note A2, quarter note G2, quarter note F#2, quarter note E2. Motion points: A2 to G2 (down), G2 to F#2 (down), F#2 to E2 (down).

With the introduction of diatonic linear motion within the pedal tone technique, the transitional finger again plays a key role in the position shifts. Unlike Figure 60, in which the pedal-tone shifts occur every two beats, Figure 63 subdivides that requiring movement on every beat. Therefore, accurate location of the transitional finger is essential as it functions as the only anchor position from which the relative fingering for the non-uniform string-skips can be estimated.

Unlike the possible repositioning of the right hand, the hybrid position in Figures 58, 60, and 63 must be executed from one hand position. The only other possibility is to reposition the palm after every two notes which is both impractical and problematic.

### 6.9.7 Pedal tone string-skipping summary

In order to summarize this technique as it is utilized within the *Caprices* it is best to divide it into three distinctive technical groups, scalic motion, arpeggiated motion, and non-incremental skips, the order of which develops the techniques systematically from the elementary scalic pedal tones to the more difficult non-incremental skips.

Any finger can be assigned to the pedal note with the fourth and first finger being the easiest to use. However, use of the second and third finger can create more problematic finger interactions. This technique in combination with linear motion can be utilized to eliminate much of this complex fingering which, in turn, is dictated by the actual pedal note.

By utilizing mainly the first and fourth finger as the pedal, subsequent notes appear above or below these fingers which can simplify relative finger positioning. This also allows the pedal finger in question to retain its anchor position on the string as it only requires removal where melody notes occur on the pedal note string.

Throughout this section right-hand positions and their movements have been discussed in depth. The use of a hybrid position that flexes at the wrist to cover all the notes within its reach is one practical option with the ratio of notes per string dropping to 1:1.

The optimal plectrum angle occurs at a virtual point between notes on the outer peripheral strings. Therefore, dependent on the range of the melody notes and how much of a bar is played in one right hand position, this point is largely mobile.

Right-hand movement was reduced incrementally throughout this section with Figure 63 played entirely in one position because of the impracticality of movement. This lack of positional movement by the right hand facilitates the need to alter the plectrum angle simultaneously with the wrist motion. This is necessary to accommodate all the notes in positions outside where the optimum plectrum angle occurs. The degree to which the

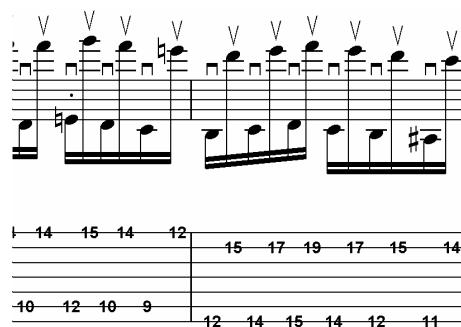
alterations occur is dictated by the distance from the position where the optimal angle arises. The plectrum arc illustrated in Figure 59 is a graphic representation of the wrist motion from which the relative incremental change of angle can be extrapolated.

## 6.10 Beyond the pedal tone concept

Although taken from ‘Caprice No. 2’ Figure 64 illustrates the next step in the development of the pedal tonal idea. Although this can arguably be viewed as pedal note technique through association, the removal of a stable harmonic anchor creates a new technical area for exploration.

Figure 64

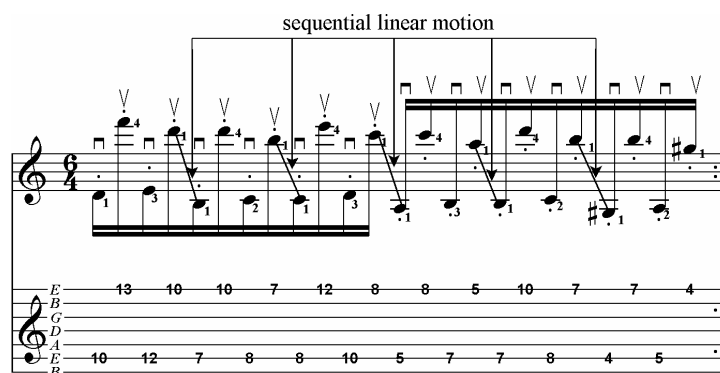
‘Caprice No. 2’, bars 64-65



By moving both the top and bottom notes the harmonic anchor has not only been removed but from a positional perspective, the linear shifts are free to be utilized on every second note. This is especially true in the second bar where the first and fourth finger can be used to play all the notes through linear motion in the left hand.

Irrespective of its technical definition, the removal of notes on the inner strings in combination with linear motion, provide the next evolutionary step in string-skipping. Figure 65 illustrates a number of techniques in combination with sequential linear motion.

Figure 65



Unlike Figure 64, which can be played with the same fingering through the use of linear motion, Figure 65 requires the fingers to cycle between peripheral strings. The fingers must be continually repositioned, accurately fretting notes and being removed without creating extraneous string noise. Because of the extreme nature of the string-skips, the fingers are prone to accidental string pull-offs especially on the upper strings.

As in previous cases, the transitional finger plays a pivotal role in relative finger positioning and linear motion. In this case, however, the transitional finger traverses six strings in conjunction with its linear motion in order to access the new position. The simultaneous nature of this motion requires the removal of all relative points of reference except the visual one, making correct string and position location more difficult.

### 6.11 Three-note-per-string arpeggiation

Arpeggios in this section are solely dependent on the performer's ability to make larger left-hand stretches on the fingerboard in a three-note-per-string format. Therefore, although they can be transposed to lower frets, they are centered around the 12<sup>th</sup> fret and above.

Figure 66 continues the natural progression from the extreme string-skipping of Figure 64 and Figure 65. These extrapolations also serve as the precursors to the three-note-per-string arpeggiation.

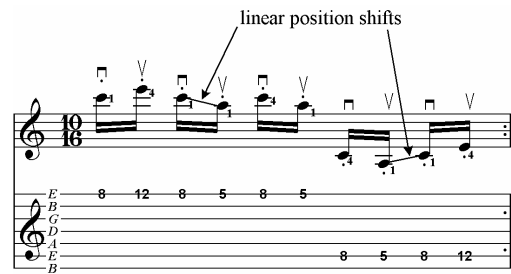
Figure 66

‘Caprice No. 1’, bar 46



Figure 67 illustrates this progression through the respective use of a C major and A minor chord, which incorporates a similar non-overlapping sequential motion to that seen in Figure 65.

Figure 67



At the string-skipping points it is possible to anticipate the motion in the left hand. In Figure 68 the A note is fretted by the first finger whilst the fourth finger can be moved into place just above the target fret.

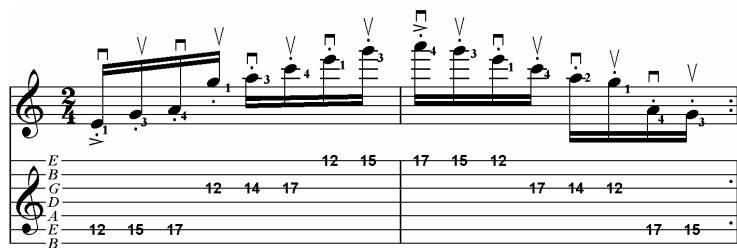
Figure 68



In larger string-skip motions, this can reduce response time considerably in addition to preventing any noticeable attenuation of the note. This technique can be adapted and used throughout this string-skip section but it is most beneficial on the more extreme skips such as those seen in Figures 65 and 68.

Figure 69 illustrates an A minor seventh chord utilizing the large stretches needed for three-note-per-string arpeggiation. In the static position, the first and four fingers retain the same five fret spacing with only the internal fingers changing.

Figure 69

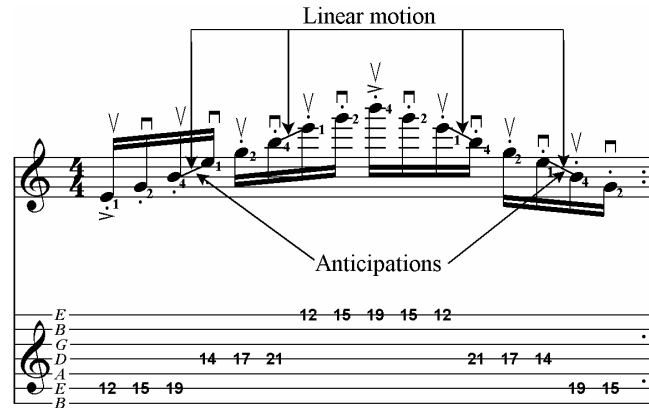


The plectrum strokes can be approached in a similar manner to a three string three-note-per-string scalic figure, the difference being that after each grouping of three notes a right-hand position shift is required. By starting with a down-stroke, the larger E to G string-skip utilizes the efficient picking whilst the smaller G to E string-skip is effected using the less efficient plectrum stroke motion.



Figure 70 eliminates the seventh note making the stretches more extreme and incorporates a three-note-per-string triadic figure in conjunction with linear motion.

Figure 70



Unlike its previous counterpart, the plectrum stroke motion begins with an up-stroke to retain the optimized picking motion for the larger leap between the D and the E strings.

The note anticipation discussed in conjunction with Figure 67, can be modified to work with the large finger spacing and linear motion. However, these factors also dictate where the pre-movement can take place. The extreme stretches from the 12<sup>th</sup> to 21<sup>st</sup> fret make it impractical (although not impossible) to pre-finger the notes whilst movement from the 19<sup>th</sup> to the 14<sup>th</sup> fret facilitates this motion.

### 6.11.1 Summary

Three-notes-per-string arpeggiation is a technique that can be developed in conjunction with alternate-picking and is easily adapted to most arpeggio patterns. Once the initial plectrum stroke motion and string-skipping has been developed, the only limitation is the ability to attain the extreme stretches required to fret the notes. These types of arpeggios,

in conjunction with alternate-picking, can often provide more aggressive attack orientated notes whilst retaining a solid rhythmic backbone.<sup>521</sup>

## 6.12 Chapter summary

Alternate-picking can be reduced to its fundamental form: single-string playing, adjacent string motion, and string-skipping motion. These in turn fall into two left-hand movement categories: static position and linear motion. From that point, the different musical techniques such as sequencing, cyclic motion, and pedal tone motion branch out. The structure of the entire chapter is built around the reoccurring theme of progressing from groupings of notes with a high note-per-string ratio to that of a low one.

Another recurring theme throughout this chapter is the development and use of both hybrid positioning and right-hand relocation issues. The hybrid position is often used in order to strike multiple strings in rapid succession without the need to relocate the right hand. As the note per string ratio drops, the practicality of position relocation in order to preserve the plectrum angle relative to the string becomes more problematic. Therefore, an average position between the two peripheral notes is used to estimate a position where the virtual optimum plectrum angle occurs. Notes outside this position can require plectrum angle readjustment, the degree of which is dependent on its relative position and where it appears on the plectrum arc.

Hybrid thumb positioning, as mentioned in conjunction with a number of examples, is defined as the same thumb position used for two or more fingerboard fret positions. This is effected by pivoting the thumb as it maintains the same position on the neck.

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<sup>521</sup> Gilbert. *Intense Rock 2*, 1991.

Linear motion, transitional fingering and relative finger positioning are interdependent to varying degrees making their correct execution essential. Moreover, much of the finger placement is relative in nature to the transitional finger making exact linear motion dependent on its correct positioning.

Finger-barrés are problematic in respect to controlling both note duration and string tone. Therefore, many of the notes occupying the same fret on different strings are often best individually fingered. Although this provides more control, it can result in a speed reduction due to the loss of efficiency that the finger-barré promotes.

Another grouping of factors that share a number of things in common is plectrum pressure, palm dampening and string elasticity, which includes string gauge. All these factors are both directly and indirectly responsible for controlling string tone continuity and variation, string dynamics, string attack, and to a certain degree, note duration and articulations. The complex interaction and infinite variations that different combinations of these factors create are aspects that personalize a musical performance. Developing them in conjunction with the musical techniques of the *Caprices* is essential in personalizing and realizing their musical potential.

The success of alternately-picked plectrum stroke motion is largely dependent on choosing the correct initial stroke. As has been shown, manipulating the initial plectrum stroke so that the larger skips utilize the more efficient plectrum stroke motion, gives the string-skip the best chance for success. All other plectrum stroke choices are often dictated by this.

Synchronization of plectrum strokes with linear motion is a technique also utilized throughout this chapter. By synchronizing the movement of the hands it is possible to coordinate either down or up-strokes with the left-hand fingerboard motion providing a checkpoint. The checkpoint is utilized to avoid incorrect note duration and a number of other factors which are most likely to occur where repositioning of either hand arises.

There are two types of anticipation discussed in this chapter: one concerns finger movement as in Figure 67, the other relates to linear left-hand movement as in Figure 21. Fingering anticipation can be used to minimize the amount of time between consecutive notes that span a string-skip. This helps preserve the given note duration and ease the transition. The left-hand anticipation that appears in Figure 21 is an aid to be used in conjunction with linear motion in order to increase the speed of positional transitions.

Alternate-picking in regard to the *Caprices* is challenging due to the mix of musical contexts, ranging from simple scalar melody to three note-per-string arpeggios and seven string pedal skips. Nevertheless, these techniques greatly benefit from the aggressive attack and continuity of string tone that alternate-picking provides.

## Chapter Seven: Hammer-on and pull-off techniques

### 7.1 Introduction

There are a number of possible methods to create string vibrations, two of the more conventional of which are plectrum use and hammer-ons and pull-offs. The former creates a string vibration by hammering the finger against the string and the fret. The pull-off, however, requires a finger to pull the string and release it to create a string vibration as it returns to its equilibrium position. The distinctive qualities of the resulting notes offer a myriad of musical possibilities.

Hammer-ons and pull-offs are generalized terms which refer to an entire battery of techniques defined by generation and perpetuation of string vibrations. These include left-hand hammer-ons and pull-offs, single-finger-tapping and multi-finger-tapping. Multi-finger-tapping can be developed to such an extent that complete hand independence can be achieved, allowing the performer to approach the fingerboard in a pianistic fashion.<sup>522</sup>

### 7.2 Fundamentals

#### 7.2.1 Use of hammer-ons and pull-offs within the *Caprices*

Within the transcriptions of the *Caprices*, hammer-on based techniques are used considerably less than sweep-picking and alternate-picking and their various combinations. The *legato* sound that can be created using hammer-ons provides a valuable bridge between bow strokes and alternate-picking even to the extent of

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<sup>522</sup> Jordan, *Master Sessions*, 1993.

mimicking notes played under the same bow stroke. In this way it is possible to replicate closely the original intentions of the composer. Thus, the technical contribution provided by hammer-ons and pull-offs to the transcriptions of the *Caprices* is significant.

### **7.2.2 Legato bowing strokes and hammer-ons and pull-offs**

Unlike the chapters on sweep-picking and alternate-picking, in which comparisons were made between electric guitar and violin technique, parallels between *legato* execution and hammer-ons and pull-offs are more difficult to draw. This is largely due to the fundamental differences between the two techniques: *legato* bowing is an “on-the-string” technique whilst hammer-ons and pull-offs are an “off-the-string” technique. Both techniques are indicated by a slur over two or more notes.<sup>523</sup> The hammer-on pull-off slur indicates notes created within one continuous string vibration, which is similar in principle to notes played under a continuous bowing stroke.

The hammer-on and pull-off technique requires little or no right-handed interaction with the strings. This in itself creates a number of interesting parallels with *legato* bowing techniques, one of which is the termination of the note by shifting to a new pitch,<sup>524</sup> which is reminiscent of the simple *détaché* bowing stroke.<sup>525</sup> Within this technique many notes are generated from an initial vibration which creates notes that vary only slightly in amplitude, a desirable quality which also has its parallel in *détaché* bowing pressure.<sup>526</sup>

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<sup>523</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 67.

<sup>524</sup> Garsed, *Rock Fusion*, 1995.

<sup>525</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 67.

<sup>526</sup> *Ibid*

Many of the nuances in tone quality that are possible within the duration of a single note<sup>527</sup> cannot be replicated on the electric guitar. However, many of the faster *détaché* bowing strokes have much in common with right-hand finger-tapping technique. One such example is *portato* or *louré*, where individual notes under the same bow stroke are separated by gaps attained by either stopping the bow on the string or lifting it from the string.<sup>528</sup> In a similar way, right-hand finger-tapping can create the same effect by independently generating string vibrations for each consecutive note. These string vibrations can be terminated by lifting the finger from the string before proceeding to the next note. Although not strictly produced under the same string vibration in the *portato* manner, the note created exhibits many similar characteristics. These include note duration, attack and swell after the initial attack.<sup>529</sup> In these cases, a gradual decrease in amplitude occurs after the initial attack, which, on the electric guitar, is created by a natural decay in vibration rather than by design, as it is in the violin stroke.<sup>530</sup> Other technical similarities between the instruments can be seen in *détaché lance* and *fouetté*: these bow strokes also have breaks between notes similar to the autonomous note generation arising in multi-fingered tapping on the guitar.<sup>531</sup>

Many of the same problems that plague *legato* string crossings also occur with the technique of hammer-ons and pull-offs. One example of this is inadequate time available to position the fingers on the new string (pre-fingering) or the need to attenuate the note that precedes the string crossing.<sup>532</sup> A fundamental difference between the two is that lifting the bow from the strings on the violin stops the note immediately preceding the

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<sup>527</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 68.

<sup>528</sup> *Ibid*

<sup>529</sup> *Ibid*

<sup>530</sup> *Ibid*

<sup>531</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 69.

<sup>532</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 66.

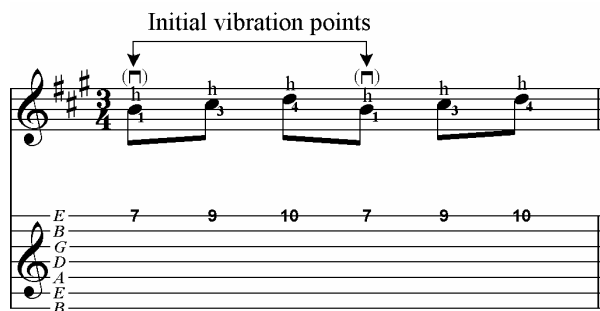
crossing point.<sup>533</sup> On the electric guitar, however, lifting the fretted finger to cross the string terminates the preceding note.

### 7.2.3 Initial vibration

There are a number of technical imperatives that apply to hammer-on and pull-off techniques. To avoid reiterating them in every section of this chapter they will be addressed before the relevant sections occur. A fundamental issue for all of these techniques is the creation of clean and usable string vibrations.

Figure 1 illustrates a fundamental three-note-per-string pattern, with the initial vibration points on the first note of the ascending figure.

Figure 1



One method of achieving the initial vibration is to hammer the first finger of the left-hand against the seventh fret. Once the first finger has initiated the string vibration it is prolonged by the other fingers on the subsequent notes.<sup>534</sup> In order to maintain an even dynamic level between notes, however, the continuation of the initial vibration is often reduced in intensity. Although this type of initial vibration does occur in single-note *legato* melody (negating the use of the plectrum completely)<sup>535</sup> it is more often associated

<sup>533</sup> Galamian, *Principles of Violin Playing and Teaching*, p. 66.

<sup>534</sup> Observed in Howe, *Hot Rock Licks*, 1989.

<sup>535</sup> Becker, *The Legendary Guitar of Jason Becker*, 2007.

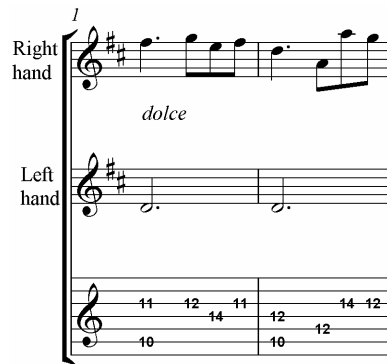


with multi-finger-tapping in which the generation of the initial vibration can often only be done with the fingers.

Figure 2 is an illustration of this: both hands are assigned to either the melody line or harmony which requires a simultaneous generation of the initial string vibration. As the melodic line and harmonic accompaniment increase in complexity, it becomes extremely difficult to generate the initial vibration through any other method than a hammer-on.

Figure 2

‘Caprice No. 20’, bars 1-2



Returning to Figure 1, it is important to note that the initial vibration is often started with a plectrum and the subsequent notes are played with hammer-ons.<sup>536</sup> This approach is commonly used by many players. It increases the technique's potential speed, by eliminating the need to lift the left hand any significant distance from the fingerboard to initiate an adequately strong initial string vibration.<sup>537</sup> Although there are exceptions to this rule, the technique of striking each new string with the plectrum in order to start the initial string vibration is used by many players.<sup>538</sup>

<sup>536</sup> Gilbert, *Intense Rock*, 1988.

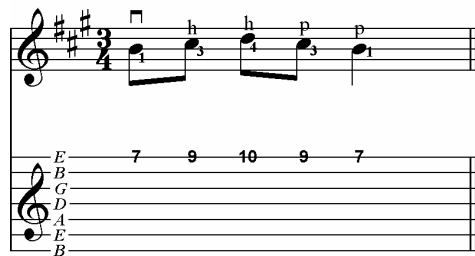
<sup>537</sup> Moore, *Speed, Accuracy, and Articulation*, 1988.

<sup>538</sup> Paul Gilbert, Michael Angelo, Greg Howe, Vinnie Moore, Yngwie Malmsteen are a few of the notable players that utilize this style of technique.

### 7.2.4 Pull-offs and fingering positions

The continuous vibration introduced in Figure 1 raises an interesting point about the positioning of the fingers on and off the string after the note has sounded. This issue is interwoven with the practical use of pull-offs, as shown in Figure 3.

Figure 3



In a three-note-per-string single-string melody both hammer-ons and pull-offs utilize the plectrum stroke to initiate the string vibration. As has been defined, a pull-off is a note generated by pulling the string with the finger and releasing it. Generating a tone in this fashion, however, requires the fingered note immediately after the pull-off to be positioned to continue the string vibration. Pull-offs, therefore, are usually utilized for descending patterns with a pre-fingered position being integral to its successful execution.

Figure 3 can be played in its entirety through the utilization of hammer-ons. In order to do so, however, each finger needs to be removed from the string cleanly and then the vibration restarted on each note by its corresponding finger. Although seemingly impractical for normal left-hand playing, multi-finger-tapping utilizes this method on a regular basis.

The descending portion shown here requires all the fingers to be in position for the pull-offs sequence to be effective.

Figure 4



Finger pressure can vary on the non-sounding notes until the pull-off vibration reaches the finger in question. At this point, normal fretting-finger pressure should be applied.<sup>539</sup> When making extensive use of hammer-ons and pull-offs, as in Figure 3, many players find it easier to leave the first finger in position. This promotes a “rolling”<sup>540</sup> of the remaining fingers onto the notes in the ascending version, with the subsequent pull-offs already in position.

### 7.2.5 String action

The ability to hold down or maintain finger position on the string brings to light string action, one of the most important issues about this group of techniques. Low action is preferable<sup>541</sup> when employing any combination of hammer-ons and pull-offs or finger-tapping. This effectively reduces both the time it takes to depress/hammer the string and the amount of effort to do so.<sup>542</sup> It is noteworthy that if the action is too low when doing any kind of tapping, the strings vibrational displacement can be adversely affected. This occurs when the string vibration reaches an amplitude, where it hits the unused frets between the bridge and the fretted note. Effectively this alters the string’s natural

<sup>539</sup> Observed in Garsed, *Rock Fusion*, 1995.

<sup>540</sup> *Ibid*

<sup>541</sup> Jordan, *Master Sessions*, 1993.

<sup>542</sup> Garsed, *Rock Fusion*, 1995.

vibrational constant and in doing so creates a “string buzz”.<sup>543</sup> This limits the string tone, dynamics and the string’s natural ability to sound clearly: and in turn limits the ability of the pickup to sense and transmit a clear string vibration.

When utilizing the plectrum to generate the initial string vibration, the difference in attack and timbre to the subsequent hammer-ons/pull-offs becomes apparent.<sup>544</sup> A number of different methods can be utilized, however, to smooth the transition between the two different attacks.

In standard alternate-picking, the string gauge and plectrum pressure affects the initial attack of the note<sup>545</sup> whilst hammer-ons and pull-offs have virtually no initial attack. In order to minimize the disparity between the two, minimal pressure is required when holding the plectrum.<sup>546</sup> This aids in minimizing the initial plectrum attack,<sup>547</sup> effectively allowing it to flex more when it strikes the string. This method reduces the abrasive attack of the pick on the strings and makes the sound more homogenous with the *legato* sound that hammer-ons and pull-offs generate. Nonetheless, striking the string with insufficient power to create a strong enough vibration can adversely affect the volume for consecutive notes. When developed, however, the difference between plectrum attack and subsequent hammer-ons and pull-offs can become almost indistinguishable from each other when so desired.<sup>548</sup>

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<sup>543</sup> Jordan, *Master Sessions*, 1993.

<sup>544</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>545</sup> Garsed, *Rock Fusion*, 1995.

<sup>546</sup> Lane, *Power Licks*, 1989.

<sup>547</sup> *Ibid*

<sup>548</sup> *Ibid*

The previous paragraph raises an important question about overall dynamic control when utilizing hammer-ons and pull-offs. Many players utilize some type of distortion in single-finger finger-tapping to create a smooth, dynamically homogenous string tone<sup>549</sup> through its natural affinity to compress the guitar sound.<sup>550</sup> However, one of the disadvantages of using distortion/compression for dynamic equality is the narrowing of the available range for effective accents and other dynamic nuances. Because this occurs naturally, accents above the compression threshold are “squashed down”, making dynamic effectiveness directly proportional to the quantity of distortion used.

Another adverse affect of using distortion is its degree of effectiveness in playing multiple parts. Whilst single note melody responds well to the use of distortion, multi-finger-tapping that uses independent melody lines and harmonic accompaniment can respond poorly to the use of excess distortion. Often the resulting inability to differentiate independent melodic characteristics, dynamics, and melodic contours far outweighs its benefits. However, some guitarists avoid this by using either double-neck guitars<sup>551</sup> or two guitars (one on a stand),<sup>552</sup> both of which are run into separate pre-amps. This helps separate the independent elements, allowing each to be controlled through individual amplification settings appropriate to their roles.

This type of multi-fingered-tapping also raises the minor question of volume discrepancies between individual fingers. These occur when a finger is hammered with

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<sup>549</sup> Heard in ‘Eruption’, Van Halen, *Van Halen*, 1978.

<sup>550</sup> Ted Fletcher, ‘Recording in the Real World’, <http://www.tfpro.info/masterclass/5sep05.html>; accessed 16<sup>th</sup> April, 2007.

<sup>551</sup> Observed in Michael Angelo, [http://www.deanguitars.com/angelo/mab\\_videos/](http://www.deanguitars.com/angelo/mab_videos/); accessed 16<sup>th</sup> April 2007.

<sup>552</sup> Jordan, *Master Sessions*, 1993.

either insufficient or too much force.<sup>553</sup> In contrast to plectrum note generation, where the finger simply depresses the note, hammer-on techniques require a string vibration that is strong enough to be self-perpetuating. Each finger, therefore, requires the same strength and dexterity in order to perpetuate string vibrations at equal dynamic levels.

Two premises often hold true when identifying problem issues when generating notes with the fingers: the fourth finger is often the weakest and the third and fourth finger are the hardest to coordinate.<sup>554</sup> Although this is a generalization, it holds true for both hands and for techniques ranging from simple hammer-ons and pull-offs to full double-handed independence.

Figure 5 illustrates a fingering exercise that utilizes hammer-ons and pull-offs on both hands. In order to facilitate technical proficiency, both should be practiced independently before being attempted together.

Figure 5



One of the more confusing concepts to grasp with an exercise of this nature is that the lower right-hand part occurs higher up the neck than its left-hand counterpart. This can cause some confusion due to the conventional experience in guitar playing that the higher

<sup>553</sup> Jordan, *Master Sessions*, 1993.

<sup>554</sup> Gilbert, *Guitar Techniques*, 2006.

up the neck the higher the pitch. However, its introduction at this basic level coincides with the appearance of independent note generation in its embryonic stage, an idea pursued further in the multi-finger-tapping section of this chapter.

Utilizing the same fingering, the positioning of the right-hand occurs from above the neck whilst the left-hand assumes the more traditional role from below. This creates a fingering anomaly where the same or very similar rules that apply to the left-hand are now valid for the right-hand.<sup>555</sup> Some of these include fingering angle, note fretting, and arm positioning<sup>556</sup> although from a development perspective the ability to use the same fingering on both hands is important.<sup>557</sup>

At this fundamental level the melody contours and the fingering are the same; the more difficult concept to grasp is the utilization of different intervals between frets. This represents one of the first basic steps towards separating the two hands, which reaches its full potential in guitarists such as Stanley Jordan.<sup>558</sup>

### **7.2.6 String gauge and dynamics**

There are a number of interconnected dynamic concerns that Figure 5 raises, including dynamics within an individual hand and dynamic balance between the hands. As in pianistic technique, uniformity of tone, note duration, and dynamic level are desirable although the latter is linked to some extent to string gauge.

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<sup>555</sup> Jordan. *Master Sessions*, 1993.

<sup>556</sup> Dependent on the individual's physical attributes modifications may be required. This is largely due to the difference that occurs when approaching right-hand fingering from above the neck.

<sup>557</sup> Jordan. *Master Sessions*, 1993.

<sup>558</sup> Heard throughout, Jordan, *Magic Touch*, 1985.

Unlike piano technique, in which pressing a finger on to a key activates a hammer which then produces a sound by hitting the string, there are no intermediate steps in the generation of sound with finger-tapping. As a consequence, the actual tapped notes are a direct result of hitting the strings with the fingers and this has both positive and negative aspects. On the positive side, the guitarist is directly responsible for the quality and clarity of each individual note: this gives him the ability to control note characteristics such as vibrato, which, as with many other note colourings, are impossible to produce on the piano with conventional technique. A negative aspect of this, however, is the lack of an intermediary device to strike the strings, which means that the hand and fingers need to be in exactly the right position every time a note is struck. This can be problematic when excessive movement around the fingerboard is necessary and the problem is exacerbated further by the need to strike different string gauges in a way that produces the same dynamic level.

As the tapping motion involves hammering against both the string and the fret simultaneously, the heavier the string gauge, the more weight there will be behind the hammering motion. If tapping pressure is exactly equal, this makes the heavier gauge round-wound strings louder in comparison with the smaller flat-wound strings.<sup>559</sup> Consequently, as the string gauge alters incrementally across the tuned spectrum so too does the amount of pressure required to tap an even melody line that spans any number of strings. Thus, the achievement of an even dynamic volume is dependent on the ability to modify the tapping strength in proportion to the difference in string gauge.

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<sup>559</sup> Kolb, *Playing in the Style of the Fender Stratocaster Greats*, 2005.



### 7.2.7 Thumb role

Dynamic levels, hammering strength, vibrato and multiple-hand positional movement, are all reliant on the fingers' ability to generate a clean usable string vibration. With so many factors in the "technical mix", a central reference point against which multiple and single hand techniques can be constantly checked is a necessity. More often than not, the thumb is used in this role on both hands.

Many of the thumb functions have been explored in conjunction with both sweep-picking and alternate-picking. However, it now takes on an additional role within the hammer-on technique family. Continuous generation of string vibration that is the mainstay of this technique requires the thumb to work in opposition to the increased finger pressure.<sup>560</sup>

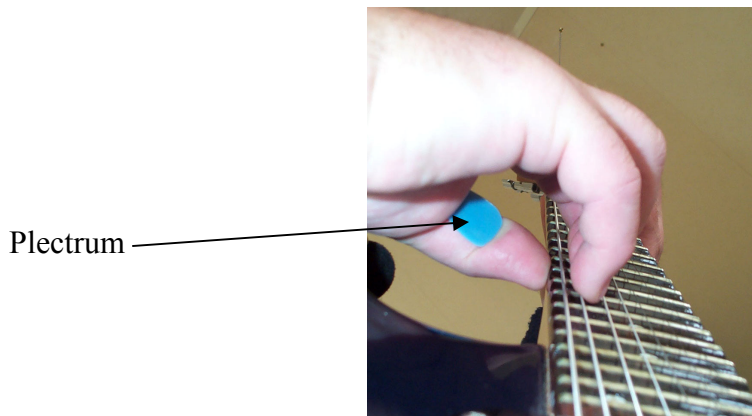
Although this concept is not new, the same principles can be applied to the right-hand for multi-finger-tapping with the right-hand thumb position on the top of the neck.

A downwards pressure from the thumb on the right-hand is needed if it is to retain its position on the top of the neck and provide the necessary opposing pressure required by the fingers. The relationship between the thumb and the fingers is slightly different to that between the hands. As we have already seen, the left-hand fingers and thumb create a gripping motion which is central to the perpetual creation of the string vibrations needed for hammer-ons and pull-offs. However, as Figure 6 illustrates, the right-hand thumb position is held in place through the utilization of a light downwards pressure against the top of the neck.

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<sup>560</sup> Martian, *El Arte Flamenco De La Guitarra*, p. 22.

Figure 6



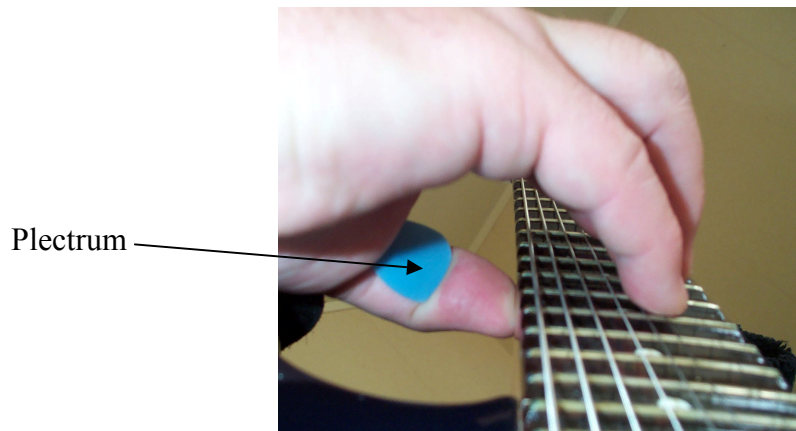
This changes the function of the thumb from a gripping motion essential for opposing pressure to that of a combined reference or anchor finger. Thumb positioning will be discussed in conjunction with specific right-hand finger-tapping later in this chapter.

#### **7.2.8 Plectrum usage before, during, and after**

Many of the finger-tapping techniques do not appear in isolation from other techniques. It is necessary, therefore, to work out a practical strategy for changing between plectrum generated notes and the various types of finger-tapping. As there are very few standardized rules in this area, placement and retrieval of the plectrum can be based around one simple objective - speed. The plectrum requires storage when not needed and instant, imperceptible retrieval when required.

Figure 7 illustrates one method of storing the plectrum during a passage which leaves all other fingers free to be utilized for multi-fingered tapping.

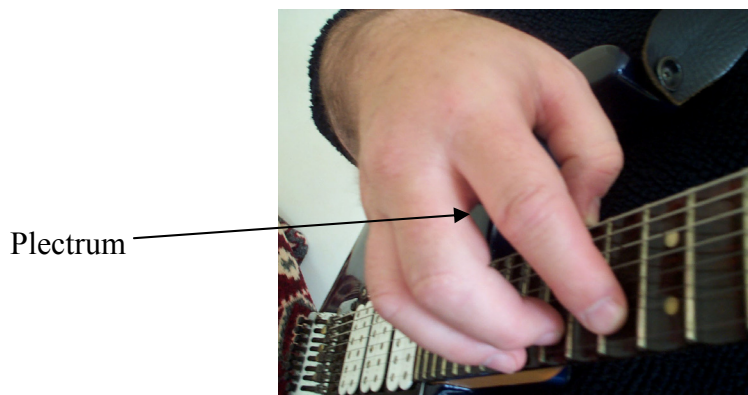
Figure 7



Placement of the plectrum in this fashion allows the thumb to function as an anchor point whilst retaining its role as a pivoting reference point.

Figure 8 demonstrates an alternative utilized by many players for single-finger-tapping. This requires the plectrum to be placed between the first and second knuckle joint of the second finger.<sup>561</sup>

Figure 8



This adaptation of the technique is slightly more difficult for multi-finger-tapping as the plectrum needs to be retained whilst the fingers are engaged in the tapping motion. However, the length of the second finger allows its position, with practice, to retain enough curvature relative to the string to hold the plectrum securely in place. Although

<sup>561</sup> Gilbert, *Guitars from Mar 1*, 1996.

more difficult, it facilitates the ability to change between single-finger-tapping and multi-finger-tapping without moving the plectrum between the two storage points. This can be extremely useful when a passage alternates between the two techniques while still demanding a stationary thumb anchor point. Moreover, by placing the plectrum in the thumb joint the two tapping techniques can be alternated.

In addition to these methods many players have idiosyncratic preferences in the placement of the plectrum, which are often determined by the musical context.<sup>562</sup> This having been said, placement method for Figures 7 and 8 are relatively easy once the movement becomes familiar. In Figure 8, the thumb slides the pick down the second finger into position, whilst in Figure 7, the plectrum is moved into position on the thumb with a similar motion by either the first or second finger.

### **7.2.9 Sympathetic string vibrations**

Extraneous string noise and its elimination is a constant theme in electric guitar technique. However, the issue becomes most critical in hammer-ons, owing to the physical hammering motion against a solid guitar neck. This creates not only the desired string vibration but the less desirable vibration of the neck. As the neck and the body of the guitar are connected this vibration can transfer itself to neighbouring strings, which, left unchecked creates an ambient noise floor. Many players also utilize distortion when employing consecutive note single-finger or multi-finger tapping. This can further exacerbate the vibrational aspects by “sensitizing” the strings. For this reason many players utilize noise reduction technology such as noise gates and hush units.

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<sup>562</sup> Brad Tolinski, ‘Mob Rules’, Vol. 11, No. 10, November 1990, pp. 46-96.

Unfortunately, this can create its own problems when playing music with extremely soft dynamics since the threshold sensitivity of the units can cut off the quieter notes.

In the plectrum-generated techniques of sweep-picking and alternate-picking there are many physical factors that can be used to prevent unwanted string vibrations. Hammer-on techniques, however, require a more *legato* approach in respect to modification of the natural string decay constant. Consequently, this “hands-off” guitar technique has fewer physical resources immediately available to control unwanted string noise. Nonetheless, each individual hammer-on technique has a number of methods for controlling unwanted string vibration. Simple left-hand hammer-ons and pull-offs still have the right-hand palm available<sup>563</sup>, which can be lowered onto unused strings below the target notes. This, in conjunction with the use of the left-hand fingers above the target notes, is effective in eliminating most unwanted string vibrations.<sup>564</sup>

Single-finger finger-tapping in the Van Halen style can also use the palm of the right-hand and the fingers of the left to eliminate string noise. However, the ability to both lower the palm and move it simultaneously whilst continuing an uninterrupted stream of notes is more problematic than its left-hand counterpart.

The natural expansion of this technique into multi-fingered consecutive single-note tapping also uses the left-hand fingers to mute strings above the target notes. However, as Figures 6 and 7 clearly show, the right-hand palm is in no position to be lowered onto the strings in a muting action. Unused fingers on the left hand, however, can be utilized

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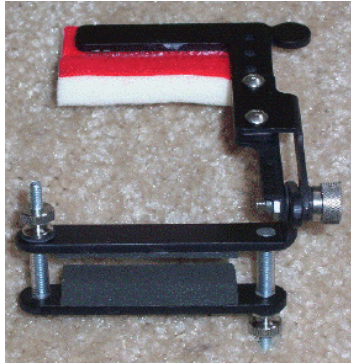
<sup>563</sup> Paul Gilbert, *11000 notes*, Hong Kong: Batgirl Records, 2000.

<sup>564</sup> Observed in Gambale, *Monster Licks and Speed Picking*, 1988.

to prevent string vibration. This is achieved by laying the fingers across the unused lower strings. Although extremely problematic due to its dependence on the fingers available, it can be relatively effective. One other method of muting the unused strings below the target area is through the use of a floating thumb position. This removes the thumb from its anchor position “laying” it across the unused strings below the target string. This effectively removes the anchor position and reference point for right-hand finger-tapping, which makes it one of the most difficult of all the muting techniques. Moreover, the anchor position moves from the right-hand thumb to the right-hand forearm where it naturally rests on the guitar body. However, the absence of an anchor point in the immediate vicinity of the right-hand fingers makes it easy to “hit” the strings inadvertently creating unwanted string vibrations rather than muting them. The origin of the problem can be traced to the placement and removal of the fingers from the string, which requires an extremely delicate touch. Inadvertent string noise can be further exacerbated by the use of low action, a set up favoured by many players who use these techniques.

Multi-finger tapping that utilizes independent harmonic and melodic lines can also use the muting techniques described above. However, there are a number of muting devices available, like the example illustrated in Figure 9, which completely eliminate the need for complex muting solutions.

Figure 9



Such devices have the added advantage of being able to be used where and when needed as they can be lifted or lowered onto the strings at will. Figure 10 shows one device on each neck allowing each hand to play independent lines whilst eliminating unwanted string vibrations.

Figure 10



Unlike sweep-picking and alternate-picking, in which modifications to the played string occur, hammer-on/pull-off techniques usually mute non-played strings to avoid inadvertently stopping the string vibration. This distinction requires increased vigilance when targeting strings for muting.

### **7.2.10 Summary**

As has been outlined above, there are a number of technical issues which, to varying degrees, are common to all members of the hammer-on family. Many of these concern the method of generating the continuous string vibrations that are the foundation of the entire technique.

Once the problem of string vibration has been addressed it is necessary to consider interrelated issues, including plectrum storage and retrieval, thumb pivoting and reference points, dynamic interaction between hands and their relation to string gauges and different methods of noise reduction in relation to the different finger-tapping techniques. Having dealt with technical issues common to hammer-on techniques our attention now turns to specific technical problems.



## 7.3 Left-hand Hammer-ons and Pull-offs

### 7.3.1 Introduction

The terms hammer-on and pull-off in this section describe the left-hand technique that either initiates or continues a string's vibration. One of the most obvious musical aspects of this technique is the production of notes with very little attack; it is particularly suited to *legato* playing and contrasts markedly with the strong attack of plectrum generated notes. The technique can be utilized in most situations where alternate-picking or sweep-picking occurs, creating a *legato* quality to the sound.

### 7.3.2 String motion and plectrum use

Much of the technical basis for plectrum use has been addressed in the alternate-picking chapter. In general terms, a plectrum stroke initiates the string vibration <sup>565</sup> with consecutive notes continued with hammer-ons and pull-offs. This method is widely used <sup>566</sup> because it minimizes the plectrum's more abrasive attack on the *legato* characteristics of hammer-ons and pull-offs. <sup>567</sup>

Figures 11 and 12 illustrate how in a practical playing situation three and four-note-per-string scales with hammer-ons and pull-offs can be combined with an initial plectrum stroke on each string.

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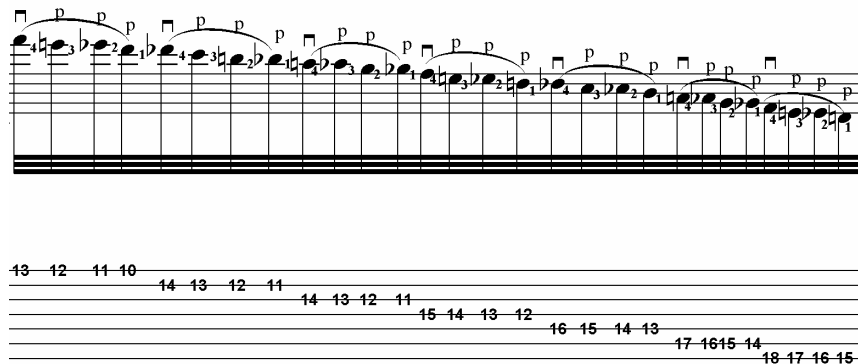
<sup>565</sup> Gilbert, *Guitar Techniques*, 2006.

<sup>566</sup> Observed in Holdsworth, *REH Instructional Video*, 1992.

<sup>567</sup> Garsed, *Rock Fusion*, 1995.

Figure 11

‘Caprice No. 17’, bar 21

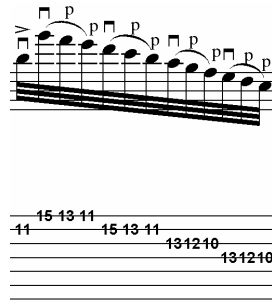


This extract not only illustrates the practical use of striking each new string with a plectrum stroke but also how the more difficult finger-generated string vibration may be applied.<sup>568</sup> By its very nature the continuation of the string vibration requires the third finger to be in position by the time the note generated by the fourth finger has reached its full duration. In order to achieve this, two equally valid methods can be utilized. The first involves hammering all four fingers onto the string at the same time, placing them in their correct fret positions whilst generating the initial vibration. Due to the design of the guitar, however, only the initial vibration created by fretting the string with the fourth finger will sound. The second and marginally more difficult method requires the positioning of the first three fingers on their respective frets prior to the initial string vibration. A fourth finger hammer-on then creates the string vibration that the other fingers are in a position to continue. In contrast to the previous method, a dynamic limitation is created by the distance that the fourth finger can be lifted from the string while its counterparts remain in position.

<sup>568</sup> Garsed, *Rock Fusion*, 1995.

Figure 12

‘Caprice No. 17’, bar 23



### 7.3.3 Relationship between bow strokes and hammer-ons and pull-offs

This discussion also revisits an issue raised in the introduction concerning the use of these guitar techniques in conjunction with the original bowing strokes. In order to retain the kind of uninterrupted flow of notes created by the bowing motion in Figure 13, minimal or no use of the plectrum is needed.<sup>569</sup>

Figure 13

‘Caprice No. 17’, bar 23 (given edition)



When comparing Figures 12 and 13, a break up of the natural flow of notes through intermittent plectrum strokes becomes apparent. However, fluidity can be preserved by reducing plectrum pressure at these points, which minimizes the abrasive plectrum attack at the string crossing points. With this in mind, some guitarists substitute the stronger down-stroke at the string crossing points for the weaker up-stroke.<sup>570</sup>

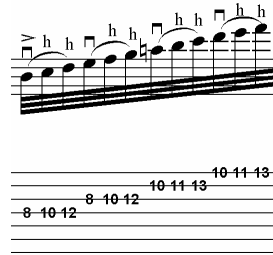
<sup>569</sup> Observed in Becker, *The Legendary Guitar of Jason Becker*, 2007.

<sup>570</sup> Gilbert, *Guitar Techniques*, 2006.

Figure 14 is the ascending version of Figure 12 with the plectrum creating the initial vibration at each adjacent string crossing point.

Figure 14

‘Caprice No. 17’, bar 11



By applying the aforementioned technique, all ascending and descending scalar patterns in the *Caprices* fall into the same categories as those in Figures 12 and 14. This negates the need for complex picking patterns at string crossing points.

With some exceptions and modifications already discussed, the majority of the information in the alternate-picking chapter can be applied here. The scope for development, therefore, can be narrowed to an area covered by neither of the techniques.

### 7.3.4 Ornaments and their role in developing hammer-ons and pull-offs

Ornaments provide a valuable vehicle for the development of hammer-ons and pull-offs. They aid in the development of the dexterity required to create string vibrations, which are even in both duration and dynamic level. Due to the nature of ornaments it is essential to work on smaller cells developing them before any larger passages can be attempted.

### 7.3.5 Trill and neighbour notes

A neighbour note can more accurately be described as an auxiliary non-harmonic note approached by an interval of a second from its principal note.<sup>571</sup> Moreover, it can appear immediately before or after the note in question.<sup>572</sup>

Figure 15

‘Caprice No. 10’, bars 5-6

The image displays a musical score for two staves. The top staff contains a sequence of notes with various articulations: a trill (tr) marked with an asterisk and the number 2, followed by notes marked with 'p' (pizzicato), 'h' (hammer-on), and 'V' (bow stroke). The bottom staff shows a corresponding sequence of fret numbers: 10, 9, 10, 8, 11, 10, 8, 7, 10, 11, 10, 11, 10, 9, 12. The sequence is divided into two measures by a vertical line.

Figure 15 illustrates a typical neighbour note sequence which is similar in some respects to the original in terms of bowing strokes and note groupings. Each grouping of six notes is subdivided in two; the first three notes begin with a trill and are of primary concern as the second three alternately-picked notes have been addressed in the alternate-picking chapter. The excerpt also illustrates a number of techniques that require more detailed examination.

### 7.3.6 Trill and neighbour notes

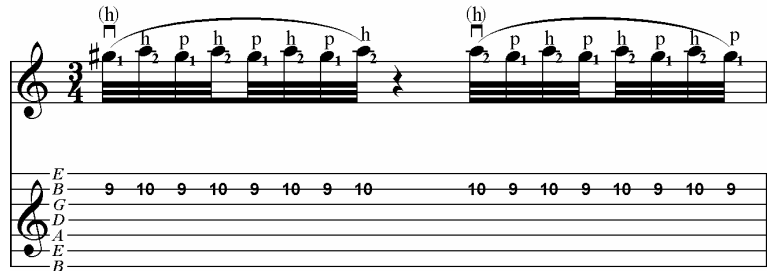
From the perspective of electric guitar development, trills provide their own technical challenges within the framework of hammer-ons and pull-offs. Irrespective of whether it begins on the upper note or the note itself and ends with a turn or not, trills provide an ideal opportunity for the technical development of hammer-ons and pull-offs.

<sup>571</sup> Dr Tom Pankhurst, ‘Neighbor Notes’, <http://www.schenkerguide.com/neighbournotes.html>; accessed 17<sup>th</sup> April 2007.

<sup>572</sup> Marshall, *Yngwie Malmsteen’s Style*, 1986.

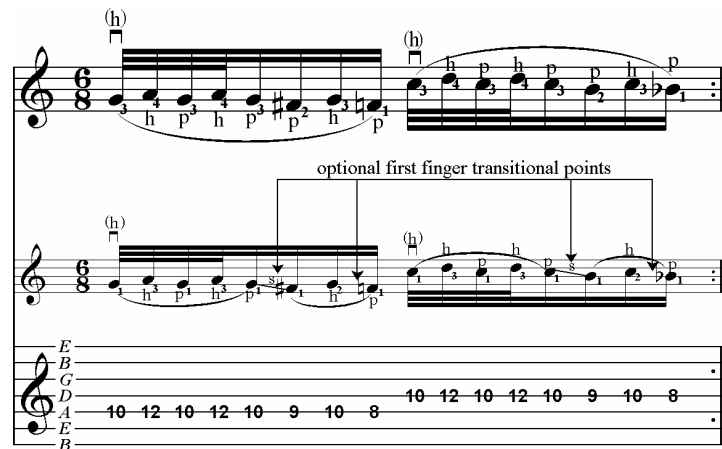
Figure 16 illustrates one possible interpretation of a trill starting on both the main note and the auxiliary note respectively.

Figure 16



The initial vibration can be started either with a hammer-on or a plectrum stroke. If the hammer-on is used, the second trill requires the first and second fingers to be placed simultaneously on the string which is analogous to the pre-finger placement in Figure 11. Figure 17 incorporates the third and fourth finger trill into a neighbour note sequence similar in form to the extracted passage of Figure 15.

Figure 17



The finger placement on the main staff promotes an uninterrupted string vibration and creates a *legato* feel similar to that provided by a bow. Although difficulties can arise due to the inherent weakness of the third and fourth fingers, the main staff fingering option eliminates the need for any left-hand movement. Once the initial string vibration has started, therefore, its continuation can be effected with relative ease.

The *ossia* staff provides a fingering option that incorporates left-hand slides which, from the perspective of fingering, is more comfortable since it uses fewer fingers. However, it also provides more of a challenge in terms of generating a continuous usable string vibration. This is achieved through the retention of the fretting pressure throughout the sliding motion.

The self-perpetuated string vibration is most at risk of being inhibited at the point where the finger slides from one fret to the next. This is where the finger passes over the fret whilst simultaneously being lifted off the previous one. Consequently, the string on the pickup side of the fret remains in contact with the finger pad momentarily which dampens the strings to a certain extent. For this deficiency to be reduced, a rapid sliding motion is preferable as it minimizes both the dampening effect of the fingers and reduces the risk of string buzz caused by the frets immediately above the slide.

Figure 18 illustrates a more complex situation having three notes leading into a three fingered chord with a trill. The trill uses the second and fourth fingers so that the two notes immediately after the event are in position to be played.

Figure 18

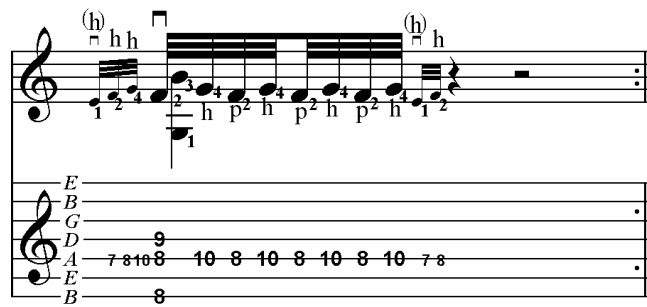
‘Caprice No. 11’, bar 6



From a technical perspective the first and third fingers are incidental as their placement can be viewed as a secondary consideration to the need for a fluent trill. Figure 19 illustrates an interpretation which demonstrates more clearly the technical problems that arise for the execution of the trill and the approach of the fingers to the string.



Figure 19



The second finger in the grace notes effectively functions as a reference point around which the harmonic accompaniment and finger placement are formed. As the trill is executed by the second and fourth finger, the first finger is free to perform both the fretting of the G note and the muting of the low E string.

The other main consideration is to ensure the fingers trilling the string do not inadvertently prevent the natural vibration of the D string, its immediate neighbour. With the previous trills, the strings in the immediate vicinity were not in use and consequently were muted. However, the introduction of a second voice in combination with the short fourth finger can increase the risk of striking the B accidentally whilst the trill is in progress. With the restricted finger spacing, execution of the trill from a vertical position<sup>573</sup> reduces the chance of inadvertently striking the D string. The vertical position is achieved by “curling” both the fingers and the hand position, providing the fourth finger with the vertical elevation required.<sup>574</sup> This approach is mirrored in finger-tapping and is also extremely useful in part-writing in which movement occurs within the inner voices.

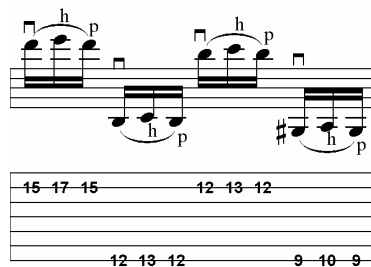
<sup>573</sup> Martin. *El Arte Flamenco De La Guitarra*, p. 22.

<sup>574</sup> *Ibid*

In order for the technique to evolve it is necessary to apply the hammer-on and pull-off concept to both adjacent string motion and string-skipping motion. Figure 20 includes elements of sequential motion and string skipping with the initial vibration generated by the plectrum.

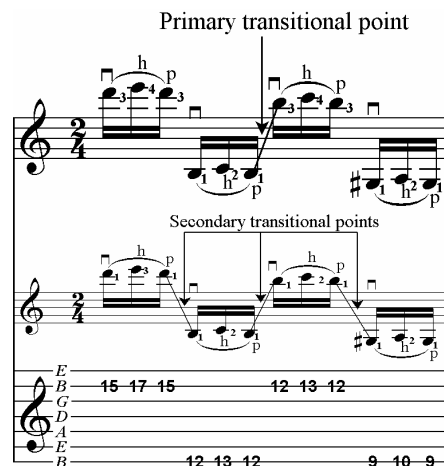
Figure 20

‘Caprice No. 24’, bar 95



Figures 20 and 21 represent the upper level of technical difficulty in the transcriptions due to the extreme range of the string skipping.

Figure 21



One of the more pertinent concerns with this type of neighbour-note sequence is the transitional movement and its direct influence on the choice of fingering. While using the primary transition point only one position shift is required; this effectively divides the fingers into groupings of two. The high notes appear above the lower notes in both pitch

and physical proximity on the guitar neck. Therefore, whilst the first three high notes are being played with the third and fourth fingers, the first finger is free to pre-finger the first note simultaneously on the B string: the advantage of this is the reduction in the audible gap between notes which is normally associated with movement across larger numbers of strings.

The secondary option given in the ossia staff utilizes the stronger fingers, however, it requires faster movement between positions in order to remain fluent. The increase in speed is made necessary by the absence of pre-fingering. This problem is exacerbated by the first finger beginning and ending the sequence on each new string. In order to facilitate the execution of the large leaps, it may be necessary early on to remove the finger fretting the last note in each group of three. Unfortunately this can create noticeable variations in note duration at these points if done incorrectly.

Closely related to this issue, is the clean removal of the fingers from the string so as to avoid inadvertently pulling-off the note to the open string. This kind of pull-off can manifest itself in anything from a small audible string noise to a recognizable open string pitch. Moreover, it is often more prevalent when transitional position movement is rushed.

### **7.3.7 Summary**

In practice, many of the technical concerns that apply to hammer-ons and pull-offs are common to alternate-picking and to a lesser extent sweep-picking. Once the mechanical action of executing left-hand hammer-ons and pull-offs has been mastered, it is relatively simple to apply it to most musical techniques.

With some exceptions, many of the left-hand hammer-ons and pull-offs in this section, and in much of the transcription, can be grouped under the umbrella of neighbour-note ideas. These musical techniques range from grace notes and acciaccaturas to trills.

The single most important factor when dealing with left-hand hammer-ons and pull-offs is the creation and continuation of self-perpetuating string vibration. Much of the time this takes precedence over the other factors. Even the usually important matter of fingering choice on occasion can be downgraded in importance in comparison to the facilitation of a continuous string vibration.

The similarities between bow strokes and hammer-ons and pull-offs can be used to mimic certain note characteristics. These shared characteristics can be found in both string attack and dynamic attack, allowing for a smooth transition from neighbour-note bowing strokes to neighbour-note hammer-on and pull-off sequences.

## 7.4 Single-finger finger-tapping

### 7.4.1 Introduction

Single-finger finger-tapping can arguably be viewed as an extension of left-hand hammer-ons and pull-offs. With conventional hammer-ons and pull-offs the first finger of the left-hand retains its position on the fingerboard, whilst the remaining fingers continue the string vibration through a series of hammer-ons and pull-offs. Single-finger finger-tapping extends that same action to include fingers on the right-hand. This redefines the right-hand function from its more traditional role of creating a string vibration<sup>575</sup> to specific pitch generation. Using this technique, both hands can generate notes which distinguish it from conventional guitar practice.

Developing this independence of the hands opens up much repertoire hitherto unperformable or requiring extensive musical modification.<sup>576</sup> This vastly expands the technical possibilities available to composers writing for the electric guitar.<sup>577</sup> However, before this level of independence of the hands can be achieved, an understanding of the complex relationship that occurs in single-finger finger-tapping is required. This section is focused on development of single-finger finger-tapping and its contextual application within the *Caprices*.

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<sup>575</sup> Observed in Kotzen, *Rock Chops*, 1990.

<sup>576</sup> Jordan, *Master Sessions*, 1993.

<sup>577</sup> Observed in Kotzen, *Rock Chops*, 1990.

Unlike left-hand hammer-ons and pull-offs, where one governing premise negates information replication, single-finger finger-tapping requires more development at the fundamental stages on account of the complex interactions between the two hands.<sup>578</sup> Within the *Caprices* single-finger finger-tapping can be viewed as a valuable tool, which closes the gap between total independence of the hands and simple left-hand hammer-ons and pull-offs. In this section, however, single-finger finger-tapping will be developed as a technique in its own right, focusing on its appearance in ‘Caprice No. 6’.

## 7.5 Micro elements

One of the advantages of utilizing fingers on the right-hand to complete a melody line is that it makes playable stretches otherwise impossible when using one hand. For example, tremolos that span more than an octave on one string, are virtually impossible to play with conventional left-hand hammer-ons and pull-offs. However, by utilizing a combination of right-hand and left-hand finger-tapping they are relatively easy.<sup>579</sup>

### 7.5.1 The roles of the right-hand thumb, third finger, and fourth finger

Within single-finger finger-tapping, the right-hand thumb and the third and/or fourth fingers are often used together to grip the guitar neck.<sup>580</sup> This grip functions as an opposing pressure against which the finger-tapping finger can push. Moreover, it provides additional stability for the different types of tapping motion.

### 7.5.2 Tapping motion

Figure 22 illustrates the basic octave tremolo in which the first finger retains a static position whilst the right hand creates the string vibration.

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<sup>578</sup> Observed in Kotzen, *Rock Chops*, 1990.

<sup>579</sup> Heard in ‘Quarter to Midnight’, MacAlpine, *Edge of Insanity*, 1985.

<sup>580</sup> Observed in Van Halen, ‘Eddies Solo 1995’, <http://www.youtube.com/watch?v=OK5jIZlLrM&mode=related&search=>; accessed 3<sup>rd</sup> January, 2007.

Both of these factors, as well as the musical material itself, can influence the method of pull-off used. For classification purposes, right-hand finger-tapped pull-offs can be divided into a number of categories.

583 *Ibid*

The first and arguably most common of these is the forward “flicking” motion in which the tapped note is flicked off by the finger in the general direction of the headstock.<sup>584</sup> On reaching a certain point, the string is released, perpetuating its vibration through its natural pull to regain its position of equilibrium. The second requires the exact opposite movement: the tapping finger is pulled towards the bridge rather than flicked,<sup>585</sup> creating a similar string vibration.<sup>586</sup> Both of these methods are similar in that they are based on a finger motion rather than a wrist motion. The remaining two methods, however, require a flicking motion on an angle more or less 90° to the string. This can be executed towards either the top or bottom of the fingerboard. Due to the angle of the motion relative to the string, it can often be best achieved through wrist rather than finger movement. These different tapping movements are not mutually exclusive; players are able to utilize them in any number of combinations in one performance<sup>587</sup> in order to perpetuate the required string vibration.

The appropriate choice of method can be dependent on a number of factors. In ‘Caprice No. 6’, for example, the selection and application of these pull-off techniques is often dictated by the proximity of other melodic material.

Figure 23 illustrates the two different methods of self-perpetuating pull-offs and their utilization within one bar.

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<sup>584</sup> Observed in Kotzen, *Rock Chops*, 1990.

<sup>585</sup> Observed in Bill Burke, ‘Early August with Jennifer’, <http://youtube.com/watch?v=VYx23REt1D8>; accessed 26<sup>th</sup> January, 2007. ; Lynch, *George Lynch*, 1990.

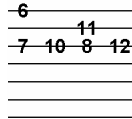
<sup>586</sup> Heard in Bill Burke, *Where’d Our Ball Go?*, Cerebral Music, 783707698625, 2003.

<sup>587</sup> Observed in Jennifer Batten, ‘Clinic at DLX music’, <http://www.youtube.com/watch?v=my8hKPKXn2Q&mode=related&search=>; accessed 24<sup>th</sup> November 2006.



Figure 23

‘Caprice No. 6’, bar 15

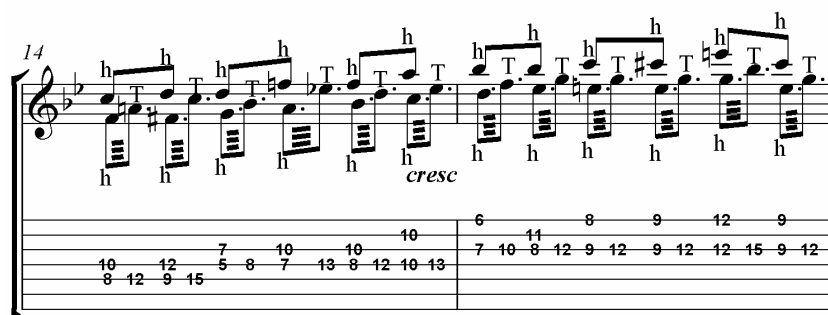


Where the first two notes are hammered simultaneously in the left hand, the unused B string is muted by the second finger, effectively providing a one-string buffer zone between the tapped tremolo and B flat. The tapped pull-off part of the tremolo can occur either towards or away from the B flat. On cursory examination, pull-off motion in the opposite direction to the B flat appears preferable in order to avoid the possibility of inadvertently striking it. Due to the fact that the B string is muted, it can be prudent to choose a pull-off motion towards the muted string, thus dealing in advance with the possibility of extraneous string noise. In the next grouping of tremolos, however, a pull-off motion away from the B flat is preferable, thus avoiding any chance of hitting the non-buffered B string and consequently interfering with the note duration.

The rapidity of notes can often render it impractical to alter pull-off direction mid-bar. Broader observations about the melodic contours can often be of assistance when planning this kind of technical detail. Figure 24, for example, clearly shows the melody appearing above the tremolo on the adjacent string, thus making it more reliable and practical to employ pull-offs in the opposite direction.

Figure 24

‘Caprice No. 6’, bars 14-15



One of the fundamental issues introduced in Figure 22 and seen in ‘Caprice No. 6’ is the creation of the initial string vibration. This is reliant on a number of factors. In Figure 25 the first note is the lower anchor note, fingered by the first finger and immediately followed by the tapped note: this arrangement makes plectrum-generated string vibration virtually impossible.

Figure 25



Only two practical choices remain: a left-hand hammer-on in the style utilized in ‘Caprice No. 6’ or the use of the tapping finger to generate the string vibration. The first method has been discussed in relation to Figure 16. Generating the initial string vibration with the tapping finger requires both fingers to be in position prior to the beginning of the melody line and thus a degree of premeditated finger placement is required.

As has been explained earlier, finger-tapping is a combination of two actions: the hammer-on to generate the tone, and pull-offs to perpetuate the string vibration.

The tapping finger can generate the initial vibration by using a pull-off motion in the same way that left hand pull-offs function. Therefore, although it is in position over the 17<sup>th</sup> fret the pull-off makes the low E sound.

Closely related to this, is the issue of which finger to utilize when finger-tapping and how it should be utilized. Although no strict convention has been established by electric guitar players, a number of common trends can be observed concerning both these aspects.

Technically speaking, all fingers on the right-hand including those gripping the plectrum and the plectrum itself,<sup>588</sup> can be utilized for tapping. However, the majority of players use either the first<sup>589</sup> or the second finger<sup>590</sup> with the more advanced players using both the first and second fingers for finger-tapping.<sup>591</sup>

There are a number of things that dictate which of the fingers are used for finger-tapping and arguably the most important of these is which fingers hold the plectrum. Many players grip the plectrum between the first finger and the thumb exclusively, freeing up the second finger to execute the finger-tapping. Conversely, some players grip the plectrum between the second finger and the thumb, allowing the first finger to access the tapped notes. Both methods have the inherent weakness of not being able to utilize the

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<sup>588</sup> Heard in 'Surfing with the Alien', Joe Satriani, *Surfing With the Alien*, Relativity Records, Inc., 88561-8193-2, 1987.

<sup>589</sup> Paul Gilbert, 'The Four Seasons', <http://www.youtube.com/watch?v=bgZi5Jb0BBs>; accessed 27<sup>th</sup> November, 2006.

<sup>590</sup> Observed in Yngwie Malmsteen, 'Trilogy Suite op: 5', <http://www.youtube.com/watch?v=9z9OGg0mA70>; accessed 27<sup>th</sup> November, 2006. ; Kotzen, *Rock Chops*, 1990.

<sup>591</sup> Joe Satriani, 'Midnight Masterclass', <http://www.youtube.com/watch?v=pVLuxZUm00A>; accessed 27<sup>th</sup> November, 2006.

thumb as an anchor on the top of the neck due to the fact that it is gripping the plectrum. The resulting lack in opposing pressure that the thumb anchor provides can inhibit the speed of the tapping fingers.

The absence of the anchor position can also result in the right-hand wrist inadvertently moving in concert with the finger-tapping motion. This can make it both difficult to control and often slower than movements generated from the finger-tapping finger. The problems arise from the physical effort required to move the wrist at fast tempi.

However, at faster speeds a muscular trembling can be employed which is more akin to trem-picking<sup>592</sup> and *staccato* bowing.<sup>593</sup> Unlike trem-picking, finger-tapping using the wrist requires two motions to achieve one note. Consequently, at high speeds dynamic continuity and accents become harder to achieve with consistency. Although a number of guitarists utilize this method<sup>594</sup> with varying degrees of success, a steady wrist position is preferable as it allows the majority of the movement to emanate from the finger-tapping finger.<sup>595</sup>

In order to achieve the opposing pressure that the thumb anchor provides, the plectrum must be moved to another position on the hand, as in Figure 8. However, moving the plectrum to a different position can be time consuming, thus making its use more practical in long periods of sustained finger-tapping than in single-tapped notes within a melody line.

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<sup>592</sup> Angelo, *Speed Kills*, 1991.

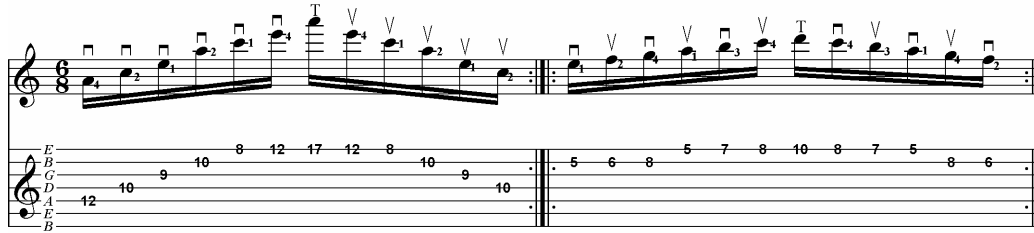
<sup>593</sup> Galamain, *Principles of Violin Playing and Teaching*, p. 78.

<sup>594</sup> Howe, *Hot Rock Licks*, 1989.

<sup>595</sup> Gilbert, *Guitars from Mar 1*, 1996.

There are instances in which a single note tap is used to complete a melody line<sup>596</sup> making it less practical to remove the plectrum from its position as illustrated in Figure 26.<sup>597</sup> In these cases, the finger that is not being used to grip the plectrum<sup>598</sup> can tap the target note.<sup>599</sup>

Figure 26



There are a number of practical concerns when utilizing this technique for single or multiple tapped notes. Arguably the most important of these is the movement of the plectrum hand from its optimum picking position near the bridge to the target note. Attempting this movement in one abrupt motion is extremely problematic. In this case, the finger-tapping hand is required to make the transition in the space of a sixteenth note. Incremental motion by the plectrum hand towards the tapped notes whilst still executing its assigned plectrum tasks is more desirable.<sup>600</sup>

Such a radical movement across the strings creates a situation where string elasticity changes considerably in relation to plectrum pressure at each incremental step. In order to preserve an even tone and dynamic throughout the motion, a lighter plectrum pressure is needed.<sup>601</sup> In addition to this, the plectrum can vary relative to the string. The angle is

<sup>596</sup> Yngwie Malmsteen, 'Trilogy Suite op: 5', <http://www.youtube.com/watch?v=9z9OGg0mA70>; accessed 27<sup>th</sup> November, 2006.

<sup>597</sup> Observed in Howe. *Hot Rock Licks*, 1989.

<sup>598</sup> Observed in Petrucci, *Rock Discipline*, 1995. ; Lynch, *George Lynch*, 1990.

<sup>599</sup> Tolinski, 'Mob Rules', pp. 46-96.

<sup>600</sup> Observed in Gilbert, *Intense Rock*, 1988.

<sup>601</sup> Observed in Garsed, *Rock Fusion*, 1995. ; Holdsworth, *REH Instructional Video*, 1992.

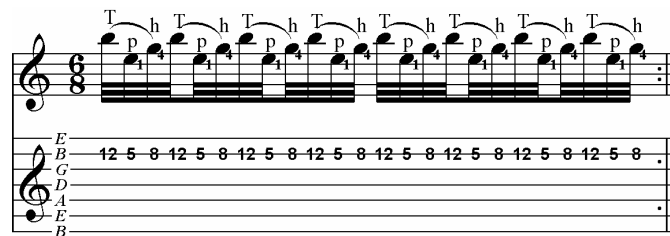
determined by both the plectrum's normal position in relation to the tapped note and the number of notes between those two points. Typically in this type of situation, the substitution of hammer-ons and pull-offs for plectrum strokes makes it possible to re-orientate the stroke motion if desired.

## 7.6 Macro elements

Now that the micro elements and their related issues have been addressed systematically, it is possible to progress to the larger fragments and their contextual relationship with ‘Caprice No. 6’. The finger-tapping tremolos in this piece require the development of a number of specific and interrelated techniques.

Figure 27 is the finger-tapping pattern popularized by Eddie Van Halen in the early 1980s. The basic principles are still relevant to the development of consistency, stamina, and coordination.

Figure 27



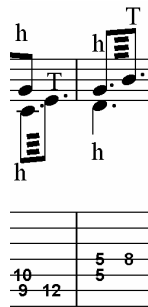
Consistency within single-finger tapping can be divided into two areas when the tapped note appears in a 1:2 ratio with the left hand notes: note duration and dynamic level. In reality, however, only the fourth finger and the tapping finger are in motion, as the first finger is held in place. The coordination needed between these two fingers can initially limit the speed of the overall exercise. However, once the interaction between the hands has developed, consistency in both note dynamic and duration can develop. This can be

easily overlooked in an exercise such as Figure 22 where no real co-ordination is required. The relatively intensive nature of this exercise also requires a certain degree of stamina. This is needed irrespective of what style of finger-tapping is employed, particularly during the sustained single-finger tapping encountered in ‘Caprice No. 6’.

Figure 28 illustrates the next stage of finger-tapping development; linear movement of the tapping finger<sup>602</sup> in conjunction with both adjacent string and string-skipping motion.

Figure 28

‘Caprice No. 6’, bar 3-4



As the tapped tremolo occurs both above and below the main melody note, a smooth transition between the two is required. The physical transition is relatively straightforward although the avoidance of string noise during the movement between strings can be problematic.

Maintaining a uniform dynamic level, however, is more difficult owing to the rapid movement of the finger-tapping action. Movement from one finger-tapping area to another not in the immediate proximity can create unwanted dynamic accents when overcoming the natural inertia. The faster the finger-tapping action the more likely this is to happen. This is the unfortunate by-product of the speed required to preserve correct

<sup>602</sup> Observed in Howe, *Hot Rock Licks*, 1989.

Another matter related to dynamic levels is the physical proximity of the pull-off note to the finger-tapped note, which can indirectly affect the mobile tapping finger. The string's ability to reach greater or lesser dynamic levels is directly proportional to its displacement. In finger-tapping, however, the vibration of the string has both a vertical and horizontal component. The vertical component is created by the generation of the note through finger-tapping and the horizontal component through a right-hand pull-off motion. The dynamic level of both is reliant on the distance that the right-hand tap occurs in relation to the left-hand anchor note. Figure 29 illustrates both tone generation and perpetuation and their dynamic link to the first finger.

[illegible]

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amount of horizontal displacement that can be achieved with a pull-off motion on the G. In contrast, the tapping finger in the second bar can achieve a wider dynamic range due to the increased gap between the fret on the string. The further the distance from the anchored point the larger the string displacement.

There are a number of dynamic considerations in cases such as ‘Caprice No. 6’. Changes in tapping strength are required between positions, in order to avoid the tremolo tap overpowering the hammered chord while still retaining dynamic continuity between positions. The dynamic level of the tapped tremolo is relative to its distance from the anchor note, a factor mirrored in the hammered chords in relation to the open string nut. Unlike the tremolo tap, the non-tremolo note has to be hammered on with enough strength to reach its full duration. This must be done in a manner to avoid overpowering its tremolo counterpart. All things being equal,<sup>603</sup> accents and other dynamic markings can be more easily preserved if both hands alter their hammer-on strength to preserve dynamic continuity.

### **7.6.1 Elementary multi-finger-tapping**

A modified version of the single-finger tapping approach popularized by Joe Satriani<sup>604</sup> utilizes pull-offs to pre-fingered chord shapes by the first and second fingers.<sup>605</sup> This technique can be further modified for use within ‘Caprice No. 6’ by using first and second finger hammer-ons and pull-offs, to perform tremolos with increased speed. This represents the first digression from single-finger-tapping into multi-finger-tapping which

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<sup>603</sup> This refers to the exclusion of dynamic issues related to string gauge that have already been discussed earlier in this chapter.

<sup>604</sup> Observed in Joe Satriani, ‘Midnight Masterclass’, <http://www.youtube.com/watch?v=pVLuxZUmO0A>; accessed 27<sup>th</sup> November, 2006.

<sup>605</sup> Heard in Burke, *Where’d Our Ball Go?*, 2003.

Figure 30

### h

Another aspect that requires consideration is overall “smoothness” of the tremolo in the multi-fingered version. No difference between the multi-fingered and single-fingered versions should be discernible. Differences are most likely to be noticeable at the changeover points where evenness in note duration and dynamics is desirable to aid in maintaining the overall continuity of the melodic line.

One factor that affects this technique in terms of further development is the general orientation of the fingers. In the Joe Satriani version the first and second fingers often remain in a vertical position with the finger nail facing the headstock. This positions the first finger on the lower string and the second finger on the upper string, encouraging the player to position the right forearm parallel to the guitar neck. This is excellent for tapping notes that occupy the same fret or frets within similar proximity on different strings. However, playing more complex scale or arpeggio figures with multiple fingers is best served through the use of a more horizontal approach in the right-hand<sup>606</sup> as illustrated in Figure 8. This approach provides one of the more practical solutions to the problem of accessing the same string axis by multiple fingers between the same frets.<sup>607</sup> As the tapping fingers approach the string with a similar angle, portion of the finger and hammer-on and pull-off motion, fingering interaction problems can be kept to a minimum.

With multiple fingers now possessing the ability to access the same string, musical and technical possibilities expand exponentially since the right-hand fingers are able to

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<sup>606</sup> Jordan, *Master Sessions*, 1993.

<sup>607</sup> Observed in Jeff Watson, ‘Guitar Solo LA 1982’, <http://www.youtube.com/watch?v=OjnaC1tWCUA>; accessed 18<sup>th</sup> April, 2007.

generate both harmonic and melodic material. Figure 31 illustrates one possible practical application of this idea within the parameters of ‘Caprice No. 6’.

Figure 31

Both the first and the second finger hammer-ons and pull-offs function in the same way as those in Figure 30, the only difference being in the alternation of melodic notes. The bracketed third finger in the second half of the bar illustrates the introduction of a previously unused finger on the right hand.

Figure 32 introduces a modified sequential pattern for the right hand first seen in Figure 27, which incorporates right-hand movement of the type encountered in ‘Caprice No. 6’.

Figure 32

The use of multi-fingered right-hand linear motion introduces a number of previously unused capabilities, however, these require development at this fundamental stage owing to the ramifications in the later multi-fingered portion of this chapter.

Within this one exercise all four fingers on the right-hand are utilized through four distinct linear movements. This occurs whilst the harmonic accompaniment is held down by the left-hand.<sup>608</sup> Each of the right-hand linear movements starts with a tapped fourth finger immediately prior to the chordal hammer-on in the left hand. However, the right-hand adjacent string motion creates a scenario in which both notes of the left-hand static chord are pulled-off consecutively and this creates a number of practical issues.

One of the most important of these has been addressed in relation to ‘Caprice No. 6’: the need to avoid striking the vibrating string whilst right-hand hammer-ons and pull-offs occur on the adjacent string. The *ossia* staff provides a solution which is not dependant on the direction of the pull-off. This appears in the form of a buffer string that can be muted by the underside of the fourth finger on the left hand.

As with both linear and adjacent left-hand motion, right-hand movement follows similar rules for overlapping positional movement. In this case, however, the right-hand thumb positioning on the top of the neck is more flexible in terms of positional tolerance than would be expected from its more traditional left-hand counterpart. One thumb position can be used for all the right-hand positions if correctly placed. This is possible due to both close fret spacing and the extra range that the right hand can achieve because of it.

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<sup>608</sup> Observed in Jordan, *Master Sessions*, 1993.

The exploitation of this aspect has far-reaching ramifications for multi-finger-tapping in the next section of this chapter.

### **7.6.2 Summary**

Much of the single-finger finger-tapping, analysis and development has occurred to facilitate its practical application in ‘Caprice No. 6’. A detailed study of mainstream finger-tapping <sup>609</sup> is not undertaken here as a great deal of literature already exists on the subject. However, many of the issues discussed here do have parallels with mainstream finger-tapping.

One of the main issues in all finger-tapping is the creation of usable self-perpetuating string vibration. Without this, hammer-ons and pull-offs in either hand would function ineffectively. Once the string vibration has been initiated, therefore, each fingered note has a twofold function; to extend the string vibration by means of a hammer-on and to continue this into the next note in the form of a pull-off.

There are a number of issues surrounding the perpetuation of string vibration which are to varying degrees interdependent. These range from string gauge and elasticity and its related dynamic implications, to the finger’s ability to create dynamic string displacement and its relationship to the anchor position. All these factors have a profound influence on the ability to continue the string vibration between notes.

As has been illustrated, all of the right-hand fingers can create and perpetuate continual string vibration. This can be done whilst the left hand holds down the chordal harmony.

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<sup>609</sup> Observed in Van Halen, ‘Eddie’s Solo’,  
<http://www.youtube.com/watch?v=OK5jIZlLrM&mode=related&search=>; accessed 3<sup>rd</sup> January, 2007.

Chordal accompaniment provides the harmonic anchor point for the right-hand pull-off notes. This digression into multi-finger-tapping is the first step to double-handed independence, a subject explored in the next part of this chapter.

## 7.7 Multi-finger tapping

### 7.7.1 Introduction

Multi-fingered finger-tapping technique, sometimes referred to as touch technique,<sup>610</sup> can be dealt with as a section in its own right although it represents the natural evolution of the single-finger finger-tapping technique. As we have seen in the previous section, the technique can evolve beyond the limited parameters set in ‘Caprice No. 6’ into a high level of double-handed independence. The quasi-pianistic style of this approach opens up repertoire was previously inaccessible using traditional guitar technique.

This pianistic approach has led to the development of a new type of electric guitar designed specifically for this style of multi-finger-tapping. The three principal examples are the Warr Guitar,<sup>611</sup> the Chapman Stick<sup>612</sup> and the Mobius Megatar.<sup>613</sup> All three have helped influence multi-finger-tapping on the electric guitar and many of the technical innovations seen in these instruments owe their inspiration to this technique.

### 7.7.2 Right-hand thumb positioning in conjunction with multi-finger-tapping

Prior to attempting any development of multi-fingered technique, it is necessary to pursue a number of aspects that relate specifically to this style of playing. One of the most important of these is the thumb position on the right hand which was discussed briefly at the end of the previous section but requires further clarification in relation to multi-finger-tapping.

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<sup>610</sup> Jordan, *Master Sessions*, 1993.

<sup>611</sup> Warr Guitars, <http://www.warrguitars.com>; accessed 18th April 2007.

<sup>612</sup> Chapman Stick, <http://www.stick.com>; accessed 18th April 2007.

<sup>613</sup> Mobius Megatar, <http://www.megatar.com>; accessed 18th April 2007.



If the thumb functions as a reference/anchor point, it follows that its pivoting motion is responsible for the delivery of the fingers to the target string.<sup>614</sup> This motion allows the thumb to remain in the same position on top of the fingerboard whilst helping the fingers retain the same curvature irrespective of fingerboard position.<sup>615</sup> The correct curvature of the fingers is necessary for all the fingers on the right hand to comfortably fret notes regardless of their length.<sup>616</sup> This can be clearly seen in the right-hand positioning in Figure 33 where a three-note-per-string melody line occurs.

Figure 33



Although the pianistic elements are relatively obvious, the position and curvature of the fingers is influenced by the preoccupation of most guitar technique; the need to generate clean, usable string vibrations.<sup>617</sup> On the piano, the physical length of the keys helps to offset differences in finger length. However, the translation of this technique to the electric guitar allows minimal margin of error owing to the restricted space between the frets and their position at which the fingers must touch the strings.

## 7.8 Micro elements and elementary multi-finger-tapping

‘Caprice No. 8’ presents a logical extension of the multi-fingered tapping explored in ‘Caprice No. 6’. With rhythmic simplicity, logical hand separation and continually

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<sup>614</sup> Observed in Stanley Jordan, ‘Autumn Leaves’, [http://www.youtube.com/watch?v=baDM3\\_6w8-E](http://www.youtube.com/watch?v=baDM3_6w8-E); accessed 18th April 2007.

<sup>615</sup> *Ibid*

<sup>616</sup> *Ibid*

<sup>617</sup> Observed in Jordan, *Master Sessions*, 1993.

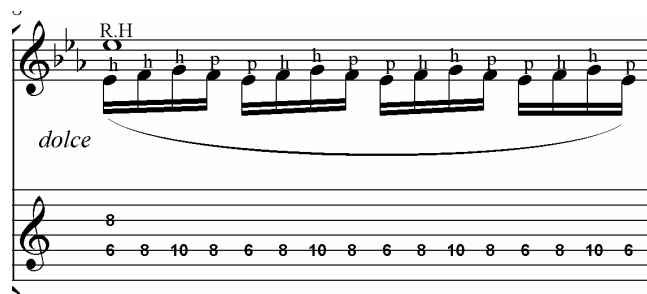
repeated right-hand motifs, the double-handed arrangements that appear in ‘Caprice No 8’ provide excellent material for further development.

### 7.8.1 Right-hand tapping motion

Unlike ‘Caprice No. 6’ in which the tapped notes are pulled off to a harmonic accompaniment, making them interdependent, the two hands function with relative autonomy in ‘Caprice No. 8’. As such, the left hand is expected to do much of the work that is assigned to the right hand in the double-handed arrangement. Figure 34 clearly shows this with the right hand performing only a simple hammer-on.

Figure 34

‘Caprice No. 8’, bar 8

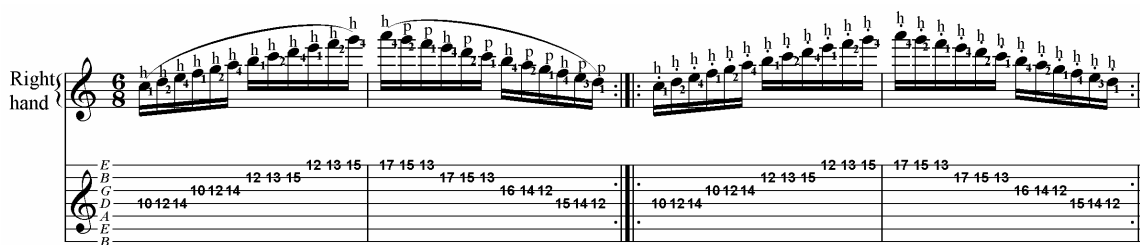


In essence, the right hand must now function as the left hand, performing the hammer-ons and pull-offs with a self-generating initial vibration. Although the majority of the left-hand information presented in the previous chapters is applicable here, there are a number of aspects that more specifically target the right hand.

One of the main issues is the autonomous self-perpetuating generation of string vibration which was addressed in the left hand in Figures 11 and 12. Two of the more mainstream methods of generating hammer-ons and pull-offs with the right hand create very different musical effects.

Figure 36 illustrates how these two techniques differ in sound.<sup>618</sup> The first is more akin to a *legato* sound whilst the second has more of a *staccato* characteristic. These right-hand hammer-on and pull-off techniques form the basis for tone generation throughout this section.

Figure 36



The *legato* illustrated in the first bar is, for want of a better term, an “on the string” approach. This means that the fingers are in contact with the string the majority of the time irrespective of whether the depressed note is sounding. In the first bar, the scale is fingered in a comparable fashion to a left-handed ascending scale with the fingers

<sup>618</sup> Jordan, *Master Sessions*, 1993.

remaining in position even after the subsequent hammer-on has taken place.<sup>619</sup> In bar 2, the descending notes require a slightly different approach if the *legato* feel throughout is to be maintained. At the point where the first hammer-on of each new string takes place all three notes are pre-fingered simultaneously.<sup>620</sup> This creates a situation where only the highest note sounds with all the subsequent fingers in position to execute the pull-offs with minimum effort.

The dynamic level of the initial pre-fingered stroke is related to this as the physical motion combines wrist and finger movement. The amount the wrist motion employed heavily influences the strength of the initial note; exaggerated wrist motion results in a louder dynamic.

The difference in physical motion of the fingers between ascending and descending scalar figures and the changing fingerings and intervals can create a number of different problems. Most, however, ultimately relate to finger length and its ability to create and perpetuate effective string vibrations on the same string axis.

In order for this to be accomplished, all the right-hand fingers must be able to touch the string at the same time. For this to happen, curvature of some or all of the fingers is necessary to varying degrees. The optimum curvature of the fingers<sup>621</sup> can be found by resting the thumb on the top of the neck and placing all the fingers on one string as in the

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<sup>619</sup> “Keeping the fingers down is a basic principle of left-hand technique of all stringed instruments” Quine, *Guitar Technique*, 1990, p. 50. This principle is equally sound for the right hand on the finger-board.

<sup>620</sup> “Preparation of this kind can play a large part in ensuring legato playing...” Quine, *Guitar Technique*, p. 50.

<sup>621</sup> Martin, *El Arte Flamenco De La Guitarra*, p. 23.

right hand of Figure 33. The position achieved in relation to the thumb anchor represents the best angle to be used when three-note-per-string scales are played by the right hand.

It is this optimum finger length that provides the starting point for most right-hand movements used within this section and in the double-handed arrangements in the transcriptions. However, musical content and related factors such as intervallic stretches, the difference in individual finger length and the distance from the anchored thumb, all contribute to the overall orientation of the hand.<sup>622</sup>

Related to this is the thumb's ability to deliver the fingers to the new target string, whilst retaining the optimum finger curvature discussed above. This is assisted by the ability of the thumb to rotate 360° whilst keeping its tip or pad in a fixed position against the neck. This, in combination with a closer fret spacing where the majority of the finger movement takes place, gives the right hand the ability to access a large range of notes and positions.

One of the more difficult aspects to become accustomed to in the right-hand descending scalar figure is the difference in physical movement between ascending and descending scales. In the ascending scale, all of the hammer-on movement occurs in the fingers, akin to fingers drumming on a desk with a fixed wrist position. However, the descending version utilizes varying degrees of wrist and finger motion and thus requires all of the fingers to be lifted and replaced at every new string.

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<sup>622</sup> Observed in Jordan, *Master Sessions*, 1993.

In contrast, the third and fourth bars of Figure 36 employ right-hand hammer-ons throughout both the ascending and descending form. Unlike the previous two bars, which have a more *legato* feel, the *staccato* sound is created by an “off-the-string” approach, lifting the finger cleanly off the string after the note has sounded. Although beneficial for technical uniformity, the two individual movements (the hammer-on then the lift-off) reduce the overall potential speed when compared to the single movement utilized in the previous bars. This method of generating a string vibration is necessary in order to perform figures such as arpeggios, in which the ratio of notes per string can be as low as 1:1.

Figure 37 illustrates a practical application of this technique in the context of multi-finger-tapping. In this case, multiple notes on different strings require autonomous note generation rather than the continuation of a pre-existing string vibration.

Figure 37

‘Caprice No. 20’, bars 1-4

Right hand

Left hand

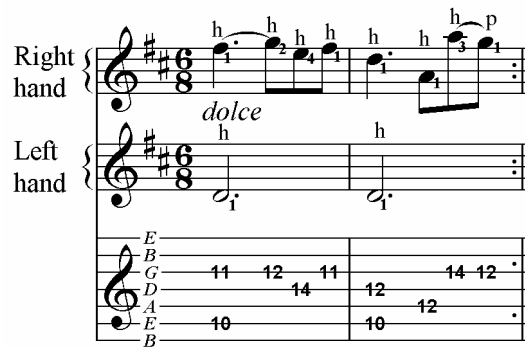
*dolce*

11 12 14 11

10 12 14 11

This also shows where a combination of the two right-hand techniques can take place, with some notes occupying the same string whilst others require adjacent motion and string-skipping.

Figure 38



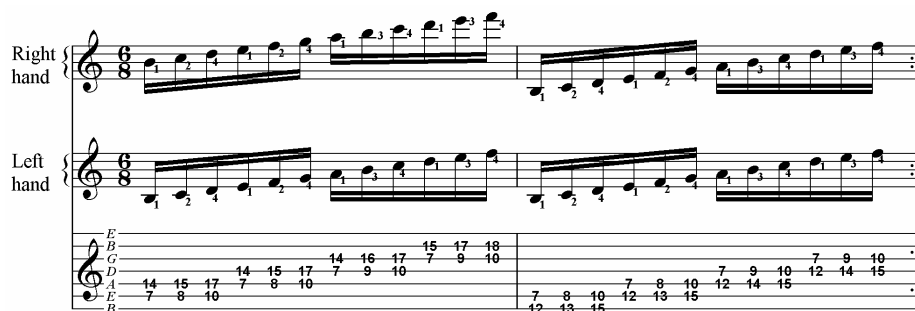
The slurs in Figure 38 are used to indicate hammer-ons and pull-offs that are a product of continued string vibration, with the unslurred notes being individually generated. One issue illustrated in bar 2 is that of two notes occupying the same fret on different strings which would normally be played using the finger-barré. This is a type of pattern that can arise frequently in multi-finger tapping, particularly in arpeggiated figures. To overcome this problem the same finger needs to be moved from one fret to the other whilst avoiding inaccurate placement that may hinder the vibration of the neighbouring E string.

### 7.8.2 Fundamental double-handed independence

Now that the fundamental fingering actions for ascending and descending scalar figures have been addressed, the next step in the development of this technique is the combination of both hands. Figure 39 illustrates one of the strengths of double-handed technique: the ability to move the same melody in the same range to different places on the guitar neck.<sup>623</sup>

<sup>623</sup> Observed in Jordan, *Master Sessions*, 1993.

Figure 39



In orchestrating the fingering for multiple melody lines it is necessary to avoid instances whereby the same string is used for different notes, preventing their sounding. This problem can be eliminated by moving all or part of a melody to an unused area on the neck. Unlike the piano, on which only one key exists for each note, different positions on the guitar neck can be utilized for the same note. This capability can be helpful to avoid double use of the same string.<sup>624</sup> It creates a plethora of musical options such as unison doubling and close melodic interaction<sup>625</sup> without the awkward fingerings commonly associated with hand-crossing on the piano. Although physical transposition of a melody can occur in its entirety or parts, subsequent string tone and overall continuity can be coloured by the use of different string gauges.<sup>626</sup> Where possible, therefore, physical transpositions should occur at the end of the phrase. At these points the changing string gauge and elasticity can be associated with the movement to a new phrase. This is often more effective and less conspicuous than a movement that is exposed in the middle of a phrase.

Figure 39 illustrates both types of adjacent string motion; the right hand appears both above and below the left-hand melody, something previously avoided. The inherent

<sup>624</sup> Observed in Jordan, *Master Sessions*, 1993.

<sup>625</sup> *Ibid*

<sup>626</sup> *Ibid*



danger with so much adjacent string activity is that either one of the hands can inadvertently strike its neighbour. Nonetheless, within the double-handed arrangements of the *Caprices* it is necessary to develop adjacent string technique both above and below the main melodic line.

### 7.8.3 Hand crossovers

The double-handed arrangements in the transcriptions require an awareness of four basic hand crossover positions: opposed and uncrossed, opposed and crossed, vertically overlapping and uncrossed and vertically overlapping and crossed. These refer to the positioning of the hands in relation to the strings and each other and not to melodic content. Figure 40 illustrates these four positions and the degree of practicality that each possesses.

Figure 40

Double handed crossover techniques

	Opposed and not crossed over	Opposed and crossed over	Vertically overlapping and not crossed over	Vertically overlapping and crossed over
Right hand				

options for passing the melodic and harmonic content between the hands. Within the *Caprices* the majority of the double-handed arrangements adhere to this practice with musical rather than technical considerations determining the choice.

Of the techniques favoured, vertical overlapping is the more difficult. Competent execution of this technique requires each hand to reach over the strings being played by the opposing hand. The right hand fingers must be arched to avoid muting the strings inadvertently that are being played by the left hand. However, the arch needed in the left hand can be less pronounced, utilizing its close proximity to the strings to mute extraneous string noises created by the right hand.<sup>627</sup> Due to the position of the hands the underside of the left-hand fingers can remain in constant contact with the strings without affecting the ability of the right hand to create notes.

Coincidentally, the non-crossed versions also makes for a more logical division of the fingerboard since the majority of the left-hand use is below the 12th fret while its right-hand counterpart is above.<sup>628</sup> In general terms, the resulting musical division is similar to that of the piano with the lower harmonic accompaniment played by the left hand and the melody by the right (Figure 41). However, as with the piano, the roles can be interchangeable.<sup>629</sup>

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<sup>627</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>628</sup> Observed in Jordan, *Master Sessions*, 1993.

<sup>629</sup> *Ibid*

‘Caprice No. 9’, bars 19-21



As the entire exercise utilizes the vertically overlapping non-crossed technique, the undersides of the left-hand fingers are required to mute the A to high E string. However, as the right hand moves in conjunction with the left hand towards the top of the neck, many of the round-wound strings have the potential to create sympathetic string vibrations. This is caused by the hammering motion which is continued and amplified through the pickups. One of the methods to combat this requires the right-hand thumb to be in contact with the strings below the left-hand notes, moving incrementally in parallel motion with the right hand. As the two hands move in an ascending motion, the thumb mutes more strings as the left hand moves towards the top of the neck. The reverse applies in the descending version where removal of the thumb from the strings to avoid the creation of an open string vibration poses the biggest challenge.

This type of unanchored thumb position on the right hand has a number of advantages besides string muting over its anchored counterpart. By eliminating the thumb's pivoting motion and natural pull on the fingers it is easier to retain the optimum finger curvature in the right hand. However, this increases the need for a visual reference to retain correct hand positioning.

Figure 43 represents different rhythmic motifs in either hand which is the next evolutionary step for the double-handed technique.

Figure 43

The musical score for Figure 43 consists of three staves. The top staff is for the Right hand, the middle for the Left hand, and the bottom for guitar fretboard diagrams. The Right hand staff is in 8/8 time and features a complex melodic line with many notes, including slurs and articulation marks like 'h' (hammer-on) and 'p' (pull-off). The Left hand staff is also in 8/8 time and has a simpler melodic line with fewer notes, also including articulation marks. The guitar fretboard diagrams at the bottom show the fret numbers for each string (E, B, G, D, A, E) across two measures. The first measure shows frets 12, 14, 15, 12, 14, 16, 13, 15, 17, 13, 15, 17, 15, 13, 17, 15, 13, 16, 14, 12, 15, 14, 12. The second measure shows frets 7, 7, 7, 7, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10.

The harmonic accompaniment of the left hand has fewer notes per beat. It cycles between the first finger in the ascending phrase and the fourth finger in the descending form. Although rhythmically different, the notes in the left hand can be synchronized to the right-hand movement to a new string with each harmony note generated by a hammer-on.

One of the factors that require familiarization in respect to double-handed playing is the differing articulations that can occur simultaneously.<sup>630</sup> This is especially true in the descending phrase in the right hand where a combination of pull-offs and hammer-ons is used which is slightly different to the all hammer-on left-hand.

Figure 44 demonstrates how left-hand notes can appear above and below the main melody, whilst constantly appearing on higher strings.

<sup>630</sup> Jordan, *Master Sessions*, 1993.

Figure 44

‘Caprice No. 8’, bar 51

Figure 44 shows the musical notation for bar 51 of 'Caprice No. 8'. The score is for guitar, with Right Hand (R.H.) and Left Hand (L.H.) staves. The R.H. staff shows a melodic line with eighth and sixteenth notes. The L.H. staff shows a bass line with quarter notes. Below the staves is a fretboard diagram with six strings (E, B, G, D, A, E from top to bottom) and fret numbers 13, 15, 16, 15, 12, 15, 14, 13, 13, 15, 16, 15, 12, 15, 13, 12.

This is related to an issue previously mentioned in which the same melodic material can be played in multiple positions on the guitar neck. Although the harmonic material appears both above and below the main right-hand melody, the left-hand notes all stem from a fixed position on the higher G and B strings. Unlike Figure 43, in which the first finger on the left hand was used for an entire bar before changing, Figure 45 illustrates the next step in hand division with the left-hand alternating fingers.

Figure 45

Figure 45 shows the musical notation for a musical exercise. The score is for guitar, with Right Hand (R.H.) and Left Hand (L.H.) staves. The R.H. staff shows a melodic line with eighth and sixteenth notes, including harmonic markings (h) and p (pizzicato). The L.H. staff shows a bass line with quarter notes, including harmonic markings (h). Below the staves is a fretboard diagram with six strings (E, B, G, D, A, E from top to bottom) and fret numbers 13, 15, 16, 15, 12, 15, 14, 13, 13, 15, 16, 15, 12, 15, 13, 12.

Utilizing a different articulation on each hand is an effective method of encouraging independence whilst relying on a certain degree of synchronization between the two hands. This is achieved by simply alternating the first and the fourth finger on the left hand. A visual reference is preferable for right-hand repositioning but the left-hand movement is effected without any visual reference. This ability is needed when

performing independent melody lines that occur on opposite ends of the fingerboard. As visually referencing both hands simultaneously is not practical, the simpler of the two parts has to be performed blind as in this example.

This step represents the beginning of independent hand articulations which can create balance problems between the two hands<sup>631</sup> when even dynamics are most desirable.<sup>632</sup> There are a number of factors that need to be taken into account when balancing these dynamic levels. Most guitar players, who have learned through traditional techniques, have more dexterity and strength in their left hand. Therefore, left-hand hammer-ons and pull-offs are likely to dominate unless kept in check. Moreover, right-hand material often occurs on the thinner high strings which require more force to generate a comparable volume to their lower, round-wound counterparts. Another factor concerns the phase cancelling effect that some pickups create in combination with varying degrees of distortion. This translates into the bass strings often overpowering the melodic material on the higher strings. All these issues need to be taken into consideration if each hand is to achieve genuine melodic independence.

With so much interplay of dynamics occurring between hands, it is necessary to establish workable maximum limits based on the quietest string, the high E string. Moreover, these dynamic parameters require reassessment when changing string gauge as a heavier gauge string is capable of producing a stronger dynamic. Exceeding this theoretical maximum on strings capable of louder dynamics creates a situation where either the melody or harmony is dynamically disproportional. Achieving a dynamic level relative

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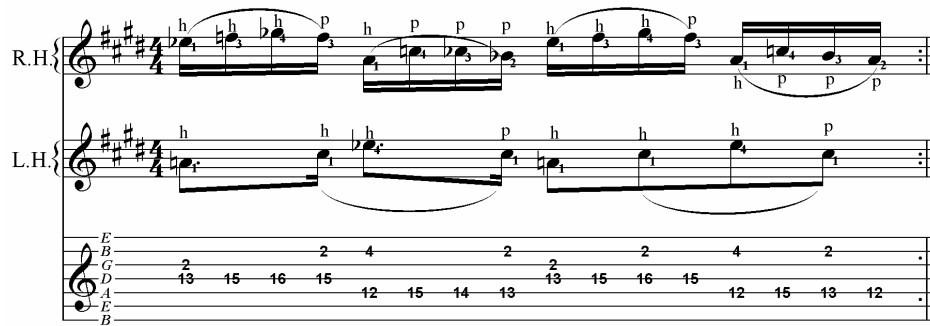
<sup>631</sup> Observed in Jordan, *Master Sessions*, 1993

<sup>632</sup> Heard in Jordan, *Magic Touch*, 1985.

to the quietest string is a skill developed through experience and its use is based on the assumption that dynamic continuity is a musical fundamental.

Figure 46 represents the next evolutionary step in this technique, the rhythmic separation of the two hands with rhythmically independent articulations.

Figure 46



Coordination and synchronization between the two hands can be maintained. The additional C sharp in the left hand requires no visual reference as it occupies the same fret on the adjacent string. Once on the second fret, the first finger retains its position with the following two notes being a continuation of its initial vibration, notated with a tie.

Within this exercise performing the dotted eighth note can be problematic in terms of coordination between the two hands. This is due to the weak part of the beat falling on the first finger's adjacent string motion. At this point, the adjacent string movement is relatively rapid whilst creating the string vibration that will be continued with a fourth-finger hammer-on. However, the dynamic continuity between the hammer-on actions can only be maintained if the vibration on the C sharp is initiated at the same volume.



### 7.9.2 Non-static positions

In order to be of any practical use, both hands need to be moved fluidly around the fingerboard. This action must be undertaken independently without either hand interfering with the other either musically or physically. Coordination and visual referencing is the main key to successful transitions with interrelated factors such as dynamics, string vibrations and overall balance between the hands also of importance.

Most of the double-handed arrangements in the transcriptions consist of melody and accompaniment divided between the hands which utilize transitional movement in both hands. Figure 47 addresses a number of related issues including interchanging harmony notes between the hands, *staccato* articulation and mobile hand transitions.

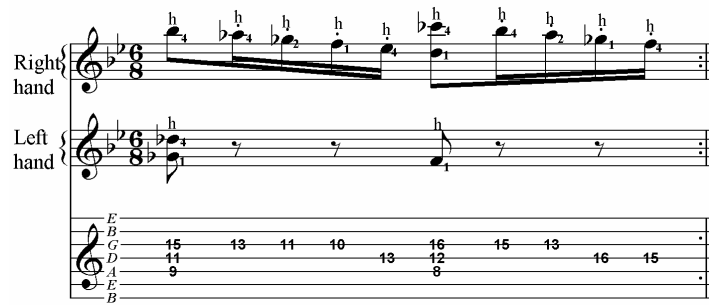
Figure 47

‘Caprice No. 10’, bar 39



Although passing the harmony between the hands is commonplace and dictated by the accessibility of notes, removal of either hand can often be necessary in order to facilitate string vibration when notes are in close proximity to each other. Figure 48 illustrates how the right-hand hammer-on technique creates a *staccato* sound through autonomous note generation.

Figure 48



The written notes give the impression that the hands are vertically overlapping with a partial cross over. If the left hand retained its position throughout the rests this would be the case with fingers on both hands occupying the same fret resulting in finger “crowding”. However, the eighth note that occurs in the left hand presents an opportunity to move it down the guitar neck once the notes reach their full duration. This motion avoids any fingering anomalies by moving the first finger from the ninth to the eighth fret immediately after the note’s full duration has been reached. Providing the left-hand fingers do not interfere with the right hand, they can retain a certain degree of contact in order to continue their muting function.

### 7.9.3 Chord voicing

It is commonplace when sounding these chords on the violin, to utilize an arced bow motion which effectively arpeggiates the entire chord. One of the advantages of the double-handed method on the guitar, however, is that the harmony can be split between the two hands and that three-note and four-note chords can be played simultaneously. Similarly, arpeggiation at very fast tempi is relatively easy utilizing double-handed technique.

Figure 49 illustrates a number of possible arpeggiations which provide different musical results and note figurations based on ‘Caprice No. 1’.

Figure 49

The figure shows musical notation for two hands and a corresponding fretboard diagram. The notation is in G major (one sharp) and 2/4 time. The first bar shows a standard hierarchical arpeggiation. The second bar shows a more complex, vertically-overlapping and crossed method. The fretboard diagram shows the fret positions for each note: E (5), B (7), G (4), D (4), A (11), and B (12) for the first bar, and E (7), B (6), G (9), D (14), A (9), and B (16) for the second bar.

The first bar presents the notes as they would normally appear in standard hierarchical arpeggiation beginning at either the top or the bottom. Although this uses the more complex vertically-overlapping and crossed method, it is possible for the notes to reach their full duration unhindered.

The second bar, however, divides the notes between the hands in a way that makes use of both autonomous individual note generation and the continuation of string vibration. The first half of the second bar has more of a *legato* feel, created by the continuation of the string vibration initiated on the G sharp. In addition to this, the right-hand fingering also takes advantage of its ability to traverse larger stretches with three notes occupying the same string. The drawback of this is the inability of each note to continue vibrating which creates a very different style of musical arpeggio to those presented in the first bar.

As each note on the second arpeggio is created by an autonomous hammer-on, the order of notes and their fret positions make it possible for each finger to retain its position on the string whilst its successors are fretted. Although the B on the 14<sup>th</sup> fret supersedes the

F sharp on the same string, the right-hand F sharp continues to vibrate providing to some degree the illusion that all notes are present.

One of the strengths of harmonic hand division is the ability to reorder the notes without compromising the overall speed. At this tempo it provides the same rhythmic consistency as drumming the fingers backwards and forwards on a desk although the four fingers are divided equally between the two hands. This approach provides a platform for both hands to perform most finger combination with no restriction on tempo.

#### 7.9.4 Repeated notes and their technical relationship to tremolos

Figure 50 illustrates how reordering the notes can be applied in a contextual situation. Here it is used as a possible solution to the wide-ranging arpeggios that appear in bars 2 and 3 of ‘Caprice No. 1’.

Figure 50

The figure displays a musical score for a piece in 2/4 time with a key signature of three sharps (F#, C#, G#). The score is divided into three systems. The first system shows the Right hand (treble clef) and Left hand (treble clef) staves. The Right hand part consists of a series of eighth-note chords, while the Left hand part consists of a series of eighth-note chords. The second system continues this pattern. The third system shows a guitar-style fretboard diagram with six strings (E, B, G, D, A, E) and fret numbers (6, 9, 14, 21, 14, 9, 6, 7, 11, 14, 19, 14, 11, 7, 7, 9, 13, 16, 12, 7, 11, 14, 19, 14, 11, 7) indicating finger positions for the notes.

This also provides a solution to the problem of performing repeated notes in rapid tempo through adapting the double-handed tremolo used in ‘Caprice No. 6’.

Two types of tremolo are employed in ‘Caprice No. 6’; one involving notes played on the same string and the other spanning two strings. Tremolos that occupy the same string have been dealt with extensively in relation to the single-finger tapping used in ‘Caprice

No. 6'. However, with the double-handed arrangement of that piece, tremolos that move between strings are used extensively with an adaptation of the movement introduced in Figure 50.

Generally speaking the two-string tremolo is used to play larger intervals such as the major third as seen here in Figure 51. The same technique can be used for fifths and octaves.

Figure 51

'Caprice No. 6', bar 7

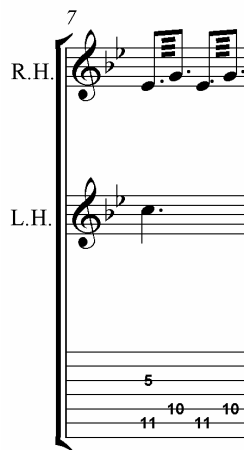
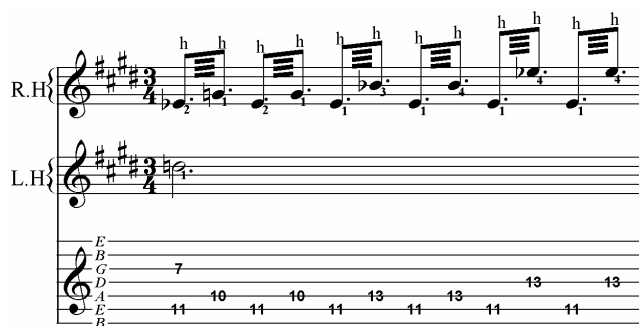


Figure 52 illustrates this procedure in the context of 'Caprice No. 6'. All of these tremolos utilize autonomous note generation since two-string movement makes continuous vibration unattainable.

Figure 52



Related, yet less repetitive, are the two-note unison patterns that occur on the top two notes of each arpeggio in Figure 50. These however, require more control than the continuous tremolo in Figure 52. The two methods of orchestrating hammer-on pull-off articulations illustrated in bar 2 of Figure 49 are also related, using a combination of continuous autonomous note generations and continuous string vibration. Which of the two techniques is used is dependent on the range of the notes; those in close proximity are easier to play on the same string. However, promoting continuous string vibration rather than autonomous note generation has a number of drawbacks most of which relate to the fingering of the repeated upper note.

Returning to Figure 50, due to the fact that the nature of the technique precludes the use of finger-barrés, the reordering of the fingers facilitates the execution of the larger stretches which creates a number of fingering anomalies. Because the highest note of each arpeggio is repeated, the first finger, although the logical choice, cannot be used to fret the second of these notes. This is owed to the extreme difficulty of getting the second finger to the correct fret. The issue can be seen clearly when examining Figure 53 where the second B would be extremely problematic to fret if the first and second fingers were reversed. The only other possible method would be to use the first finger to fret both the second F sharp and B consecutively which at faster tempi is difficult.

Figure 53



This increases the stretches between the fourth and second finger, leaving the first finger in a usable position to continue the string vibration on the B.

However, in both the second and fourth arpeggio of Figure 50, shown here in Figure 54, the conventional finger-barré is replaced by the second and first finger fretting consecutive notes on the same fret.

Figure 54



This can create difficulties, requiring the right hand to move into a position parallel to the fingerboard in the manner popularized by Joe Satriani.<sup>633</sup> Although a full reorientation of the hand is unnecessary and impractical, enough wrist motion needs to be present to facilitate the playing of the repeated note and its successor. This adaptation of the more

<sup>633</sup> Observed in Joe Satriani, 'Masterclass, Midnight', <http://www.youtube.com/watch?v=XOMeSILZoS8>; accessed 27th November, 2006.

rigid right-hand position previously described allows easier access to the notes that occupy the same fret on different strings, in this case the notes E and B.

Moving between arpeggios in bar 1 requires the use of the finger slide in order to retain usable string vibration which eliminates the need for a first note hammer-on. Tempo notwithstanding, the first finger is required to slide rapidly between notes to prevent the inadvertent muting of the string vibration at the fret point. However, changing between the second and third arpeggio can be more difficult as the first finger is now required to finger consecutive notes on adjacent strings. Although this is avoided in Figure 53, it is one of the most usable technical options in terms of linear movement.

#### **7.9.5 Double-handed linear motion**

Until now, double-handed linear motion has been limited to the type illustrated in Figure 47. Figure 50 shows that parallel and contrary motion both within and between the hands can also be accommodated.

Figure 55 is a contextual example of how different linear motions can be combined by the division of the notes between the hands. With many of the notes appearing on adjacent strings, the apparent chord clustering in the tablature wrongly gives the impression that the notes could be played solely in one hand.



Figure 55

‘Caprice No. 11’, bars 93-95

Figure 55 shows the musical notation for bars 93-95 of 'Caprice No. 11'. The right hand (R.H.) plays a melodic line with eighth and sixteenth notes. The left hand (L.H.) plays a harmonic accompaniment with sustained notes. Below the staves, a table of fingerings is provided for each hand across three measures.

Measure	R.H. Fingering	L.H. Fingering
1	12 16 14 17 15	15 14 12 10 10 12 10 9 10
2	10 14 10 11 7	10 11 7 5 9
3	7 14 10	8 7 5 9

Figure 56 illustrates that it is possible to orchestrate the fingerings to avoid crossing the hands. This can be achieved whilst effectively dealing with both contrary and parallel linear motion.

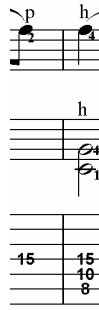
Figure 56

Figure 56 shows the musical notation for bars 93-95 of 'Caprice No. 11'. The right hand (R.H.) uses continuous string vibration articulations (h and p) over a melodic line. The left hand (L.H.) plays a harmonic accompaniment with sustained notes. Below the staves, a table of fingerings is provided for each hand across three measures.

Measure	R.H. Fingering	L.H. Fingering
1	12 16 14 17 15	15 14 12 10 10 12 10 9 10
2	10 14 10 11 7	10 11 7 5 9
3	7 14 10	8 7 5 9

The right hand mainly uses continuous string vibration articulations which contrast with the left hand's use of autonomous note generations. The reason for the orchestration of these right-hand articulations is to facilitate right-hand repositioning at the beginning of every bar. This is done irrespective of whether the melodic material appears to need it or not. This can be seen clearly in Figure 57, where both the second and fourth fingers are used consecutively on the same note.

Figure 57



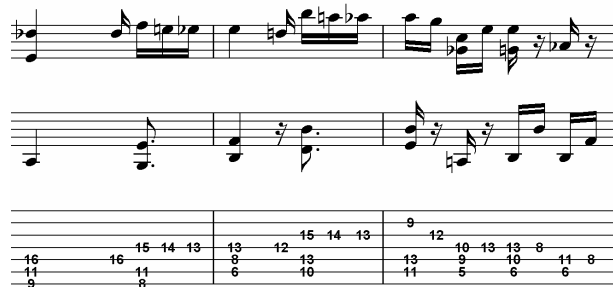
Repositioning the right hand at the beginning of every bar also provides a point from which hand motion can be synchronized irrespective of whether both hands move simultaneously on the first beat.

As there is no appreciable musical advantage in utilizing either of the hands to play certain notes, orchestration of both the melody and part of the harmony can be assigned to the right hand. The choice of finger orchestration can often be determined by factors as simple as note proximity to available fingers. However, the guiding premise is that musicality should remain unaffected. Therefore, “ping-ponging” harmony notes between the two hands can be used to combat more difficult fingerings that would otherwise occur if a strict melody-harmony division of hand function were adhered to.

Figure 58 illustrates how the line between melody and harmony assignment between the two hands can be blurred in order to avoid more difficult finger stretches.

Figure 58

‘Caprice No. 4’, bars 52-54



This figure illustrates many of the technical aspects previously discussed including harmony note movement, contrary and parallel linear motion and three-note-per-string fingering patterns. Figure 59 illustrates one of the possible fingering orchestrations that utilize all the aforementioned factors.

Figure 59

The musical score for Figure 59 consists of three staves. The top two staves are in treble clef, and the bottom staff is in bass clef. The music features complex rhythmic patterns and fingerings. The bottom staff includes a detailed fingering chart with numbers 1-16 and 8-13. The score is divided into two sections: 'first position' and 'second position'.

As in previous occasions, the left-hand fingering has been simplified: it utilizes the first and fourth fingers exclusively making the more complex right-hand articulations easier to focus on. The basic principle behind the right-hand finger orchestrations is to keep position shifts to a minimum, thus providing a stable reference point for fingerings. Although there are many fingering options that could be applied in this context, the one presented in Figure 59 avoids unnecessary position shifts.

Figure 60 shows how, with minimum hand crossing, correct finger orchestrations can avoid positional movement whilst the notes more comfortably “fall” under the fingers.

Figure 60



On cursory examination, the right-hand G in its current configuration creates a stretch which can be eliminated by playing the same note on the B string on the eighth fret. However, over the duration of the bar this option creates two position shifts with the first and second two-note chords not falling as naturally under the fingers. There are obviously times where multiple position shifts are unavoidable and indeed advantageous to subsequent fingering patterns. In combination with personal preferences this makes finger orchestration a variable that is both inexact and requiring constant revision.

The application of these principles to melody and accompaniment is relatively simple. However, technical advancement requires more even left-hand participation. From a technical perspective, therefore, ‘Caprice No. 8’ provides just such an opportunity. Bar 59 illustrates a more even distribution of material between the two hands. It is the only instance in the *Caprices* that this particular musical configuration takes place.

There are two different fingering configurations represented in the score, illustrated here in Figures 61 and 62.

Figure 61

‘Caprice No. 8’, bar 59

The musical score for 'Caprice No. 8', bar 59, illustrates sequential fingering patterns. The notation includes a treble clef with a key signature of one flat (B-flat) and a 4/4 time signature. The right hand part is marked with a 'cresc' (crescendo) and features a series of eighth notes. The left hand part also features a series of eighth notes. Below the musical notation, a table provides the sequential fingering patterns for each hand.

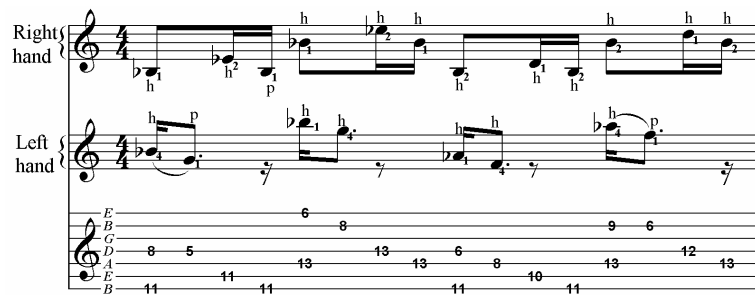
	11	8		9	6
8	8	5	13	18	13
5	11	16	11	11	15

Figure 61 more accurately reflects the sequential character of the music in the fingering, with sequential fingering patterns mirrored on each string. Although the right hand often plays the higher melody notes in this case the reverse is true. The consistent nature of the parts to some degree retains the general theme of uniformity. This type of fingering articulation and movement can be beneficial both in terms of the memorization of passages and in focusing on maintaining correct position location within the linear motion rather than the melodic material.

However, Figure 62 illustrates an approach dictated more by musicality and note proximity rather than fingering patterns. It utilizes a combination of autonomous note generation and continuous string vibration.

Figure 62

‘Caprice No. 8’, bar 59



To avoid the larger stretches that occur in the right hand of Figure 61, continuous string vibration has been replaced by autonomous note generation. This creates a situation in which the majority of notes occupy adjacent strings on the same fret or within close proximity of one another. The first half of the bar in the right hand is one such case. The angled right-hand approach can be more beneficial, allowing access for both the first and second fingers. This technique is similar to one that was presented in conjunction with Figure 50, the major difference being that the right hand can retain this position for half the bar.

Right and left-hand motion can be synchronized at the beginning of each beat where both hands move to the new position. Once the correct fingers have been placed at the beginning of each beat, relative finger placement can then be used to locate the other notes in the bar. The independence of the two lines in this passage allows the hands to work together in a left-hand, right-hand sequential order. This places the correct rhythmic emphasis on the strong beats of the bar.

### 7.9.6 Summary

Multi-fingered double-handed independence both widens the scope for technical development on the electric guitar and increases its available repertoire exponentially. Although this thesis limits its application to the *Caprices*, the technique can be easily applied to keyboard music. It can be argued that when transposing the music of double-handed instruments such as piano to the electric guitar, musical sacrifices are often required to make it playable. However, with the double-handed approach these sacrifices (usually in the harmonic content), can be kept to a minimum with many of the harmonic transpositions retained in their original form.

In order for these transpositions to be effective, clean and concise string vibrations need to be generated by both hands independently using both continuous and autonomous string vibration. By its very nature, continuous string vibrations begin with an autonomous finger generated hammer-on. The resulting string vibration is retained through a series of hammer-ons and pull-offs. Both hands are required to perform this function in conjunction with parallel and contrary linear motion which can include hand crossing and harmonic note passing.

The continuous string vibration is represented by a tie that spans the length of the string vibration, similar in principle to a continuous bowing stroke. In contrast, autonomous string vibrations are created as needed for individual notes or chords and are intrinsically slower. In the *Caprices*, the left-hand harmonic accompaniment is often generated utilizing autonomous string vibration whilst the right-hand counterpart, where possible, makes use of continuous string vibration. Where melodic material is largely single notes, continuous string vibrations can be more effectively used.

Although, this is the case within the *Caprices* it by no means establishes a rule that can be applied to all multi-fingered autonomous finger-tapping. The *Caprices* are built around the violin's technical attributes and these ultimately influence how the multi-finger-tapping technique is applied. The subjective nature of which technical variation to apply is dependent on a combination of personal and technical preferences.

## **7.10 Chapter summary**

The hammer-on technique provides a multitude of musical possibilities when applied to the *Caprices*. The subtle attack can be used to give *legato* passages a smooth feel, free of plectrum attack, whilst the more difficult multi-finger-tapping provides a truly independent realization of the melody and harmony.



## Chapter Eight: Chordal technique

### 8.1 Introduction

Far from being a new concept, chordal picking has been around for a long time on the nylon string guitar. With the advent of the steel string acoustic, semi-acoustic and electric guitar, derivative picking and finger-styles have evolved from the traditional finger-fingernail combinations used on the nylon-string guitar.

This development has arisen from the increasing demands that innovative players place on their instruments. In addition to this, advances in instrument building technology such as computer-controlled fingerboard replication have vastly improved construction and ensured the wide availability of superior instruments.

All these factors lead to a number of innovations concerning picking styles which have been modified and applied to the *Caprices*. These can be divided into three related but distinct techniques; chordal picking and strumming utilizing the plectrum,<sup>634</sup> chicken-picking utilizing a combination of plectrum and fingers<sup>635</sup> and finger technique.<sup>636</sup>

Throughout the transcriptions of the *Caprices*, chordal structure is dictated by the original violin technique which can cause awkward fingerings, muted notes and other problems when transferred to the electric guitar. The prevalence of chords throughout the

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<sup>634</sup> Meola, *Masters Series*, 1986, available from <http://www.youtube.com/watch?v=sQ3HxD8kv9o>; accessed 2<sup>nd</sup> April, 2007.

<sup>635</sup> Observed in Albert Lee, 'Country Boy', <http://www.youtube.com/watch?v=AOFpQd7aJ9U>; accessed 12<sup>th</sup> February, 2007.

<sup>636</sup> Observed in Paco De Lucia, 'Solo Spot', [http://www.youtube.com/watch?v=OV\\_OyslIKJO&mode=related&search=](http://www.youtube.com/watch?v=OV_OyslIKJO&mode=related&search=); accessed 12<sup>th</sup> February, 2007.

transcriptions necessitates further investigation into issues surrounding chord playing and related techniques.

### **8.1.1 Bowing, chordal picking and pull-offs**

Bow usage<sup>637</sup> and/or right-hand plucked strings<sup>638</sup> and pull-offs, exhibit many timbral similarities to those heard in chordal pickers such as Al Di Meola<sup>639</sup>. This can be observed in Variation IX of ‘Caprice No. 24’ where a combination of pull-offs and bow strokes are used. The initial vibration is started with either the bow or right hand, with the subsequent notes in the ascending arpeggio and scalar patterns utilizing left-hand pull-offs. This creates a timbre comparable to heavily dampened notes on the electric guitar (or steel string acoustic), which in the transcription is emulated through the use of dampening in conjunction with alternate-picking, string-skipping and sweep-picking.

### **8.1.2 Chordal playing and muting**

The use of the plectrum for both strumming and chordal picking occurs in a number of places throughout the transcriptions but its application can create a number of technical complexities which finger-picking and chicken-picking can avoid. These two-finger techniques allow strings to be played simultaneously whilst a grouping of notes struck by the plectrum is played consecutively. This allows the two-finger techniques the freedom to assign an individual finger to each string and its corresponding note. However, when striking multiple notes with a plectrum strum, it is extremely difficult to target strings accurately contributing to the chord and avoid those which are not part of the chord. It is necessary, therefore, to mute adjacent and intermediate strings that do not belong to the

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<sup>637</sup> Observed in Jascha Heifetz, ‘Caprice 24’, [http://www.youtube.com/watch?v=vPcnGrie\\_M](http://www.youtube.com/watch?v=vPcnGrie_M); accessed 21<sup>st</sup> March, 2007.

<sup>638</sup> Observed in Augustin Hadelich, ‘Caprice 24’, <http://www.youtube.com/watch?v=wB034tKF36c>; accessed 21<sup>st</sup> March, 2007.

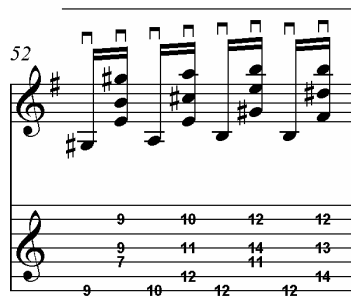
<sup>639</sup> Observed in Al Di Meola, ‘Solo Spot’, <http://www.youtube.com/watch?v=RHnth4Av-Nk>; accessed 21<sup>st</sup> March, 2007.

structure of the chord.<sup>640</sup> The differences in tuning between the violin and the guitar further increase the technical difficulty creating a number of chord shapes that require multiple string mutes and less conventional chordal fingerings.

Figure 1 illustrates how, with chords spread across so many strings and only one strum to strike the relevant ones, a number of issues can arise.

Figure 1

‘Caprice No. 1’, bar 52



Within this bar there are a number of aspects that require further examination, all of which have far-reaching ramifications for multiple-string dampened chords. Most fundamental is the direction of a strumming stroke.<sup>641</sup> In this case, two down-strokes prevent excess plectrum motion, similar in principle to sweep-picking. The motion required is a down-stroke followed by either a pushing through motion utilizing the arm<sup>642</sup> or a wrist motion<sup>643</sup> to strike the subsequent three-note chord. Irrespective of stroke direction, the depth that the tip of the plectrum moves below the strings dictates to a certain degree the dynamic level of each of the notes in the chord.<sup>644</sup> The plectrum must retain an equal relative depth below the string, if dynamic equality is to be

<sup>640</sup> Observed in Meola, *Masters Series*, 1991.

<sup>641</sup> *Ibid*

<sup>642</sup> Meola, Al Di. *Guide to Chords Scales and Arpeggios*. Milwaukee: Hal Leonard Publishing Corporation, 1989, p. 11.

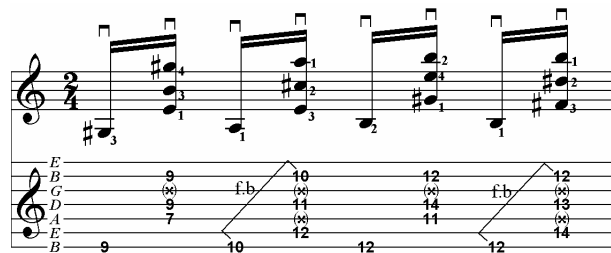
<sup>643</sup> *Ibid*

<sup>644</sup> Gilbert, *Intense Rock 2*, 1991.

maintained throughout the chord. In addition, a certain amount of flexibility is required in plectrum pressure. This allows a fluid movement through the chord avoiding “snagging” the plectrum on any one string.<sup>645</sup> This is comparable in principle to the more passive plectrum pressure that was discussed in relation to sweep-picking and for similar reasons.

Within the tablature of Figure 2, the muted strings within the chord are illustrated with a bracketed cross.

Figure 2



These are dampened utilizing the unused underside of the finger on the string immediately below them.<sup>646</sup> Although the finger is fretting a note it is possible to utilize the unused part of that finger closest to the redundant string by flattening out the finger arch, thereby muting its vibration.<sup>647</sup> On the chordal patterns that utilize the finger-barré it is necessary to mute two strings, the lower with the third finger and the higher with the second finger; the high E string is not struck at all.

Both the second and fourth chords utilize a finger-barré which gives the hand the ability to hold down one position for both the single note and its subsequent three-note chord, giving the fingers the extra time needed to be positioned correctly for both the chord and

<sup>645</sup> Garsed, *Rock Fusion*, 1995.

<sup>646</sup> Gambale, *Monster Licks and Speed Picking*, 1988.

<sup>647</sup> *Ibid*

the muted notes. However, the first and third chords, although having fewer muted notes, require the finger that is placed on the lowest note to be reused in the three-note chord. Moreover, in the first chord the reused finger must be repositioned in the space of a sixteenth note both to fret the B accurately and to mute the unused G string. The problematic nature of this kind of movement is offset by the advantage of having a common finger which can function as a reference point when moving between positions. It is worth noting that the dominant-seventh chord appearing with the finger-barré occurs throughout the *Caprices* in similar configurations, making it a required shape to master. One such example is shown here in Figure 3, utilizing the same fingering and finger-barré within a different musical pattern.

Figure 3

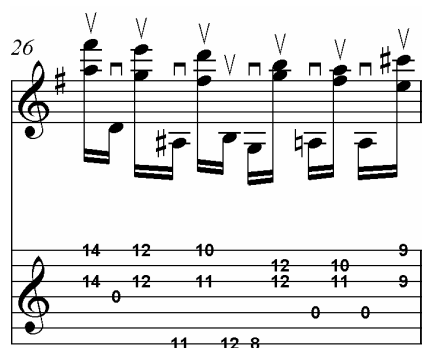
‘Caprice No. 1’, bar 3



Figure 4 illustrates an alternate strumming approach with a consistently changing bass note.

Figure 4

‘Caprice No. 15’, bar 26



Unlike the previous example, this utilizes an up-down-up pattern with the notes orchestrated in such a way that the strumming motion moves towards the subsequent note.<sup>648</sup> This provides an efficiency of motion, similar in principle to that promoted in both sweep-picking and alternate-picking.

The two consecutive lower notes in the middle of the bar function as a turnaround point. The efficiency of the plectrum stroke motion is retained by means of the consecutive up-strokes which occur immediately prior to the two lower notes in the middle of the bar. The double up-strokes contrast with the double down-strokes seen in Figure 2.<sup>649</sup> These utilize a pulling motion to strike both the double-stopped and muted string<sup>650</sup> in addition to the normal single up-stroke on the lower B. Both the double-down stroke and the double up-stroke provide an ideal means to maintain an efficient plectrum motion whilst addressing the need to change strumming stroke.

<sup>648</sup> Observed in Meola, *Masters Series*, 1991.

<sup>649</sup> *Ibid*

<sup>650</sup> *Ibid*

The muted notes have a percussive quality functioning within the chord emphasizing the initial attack of the plectrum.<sup>651</sup> As a percussive tool their effectiveness is attributed to the short time that they are audible. When performed correctly, this factor lends the initial attack an authority from which only the desired notes emerge. This effectively blends both the attack and harmonic content into the sound of the chord. Obviously, at the tempi that are encountered in the *Caprices* the effect is almost instantaneous and resembles a chord with a strong attack. The more muted notes that occur within the chord the stronger the attack, making it imperative that plectrum pressure is altered to retain both dynamic continuity and control.

Another related factor that influences plectrum pressure, movement and wrist movement, is the number of strings that the chord spans. Technically speaking, the larger the span of strings the faster the strum motion needs to be in order to retain consistent timing. Even a slight alteration in speed can require a corresponding decrease in plectrum pressure to prevent the pick becoming “snagged” on any individual string. Thus, if the rapid pulling or pushing motion of the strum changes the angle of the plectrum, the reduced plectrum pressure allows the pick to move more easily onto the next adjacent string.

The percussive nature of the strum with the additional muted notes dictates the need to emphasize correctly the strong beats of the bar wherever possible. Due to the fact that strummed down-strokes are generally stronger than strummed up-strokes it is possible to

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<sup>651</sup> Observed in Meola, *Masters Series*, 1991.

both mimic the bowing strokes and emphasize the strong beats in the bar.

### 8.1.3 Chordal picking

Chordal picking is a technique adopted by many steel-string acoustic guitarists to play chords. Unlike in conventional arpeggiation, the notes are allowed to run together.<sup>652</sup>

From a technical perspective, chord shapes like those encountered in ‘Caprice No. 1’ have been arranged so that the notes are played consecutively. However, chordal picking can also be applied here with different musical results due to the employment of simultaneous vibrating strings.<sup>653</sup>

This technique has been avoided in the current orchestration since it is more usually used on the acoustic guitar.<sup>654</sup> Although the two instruments frequently employ very different techniques, many passages in the *Caprices* can be transposed unaltered to the steel-string acoustic guitar. Therefore, chordal picking, as has been described above, can be successfully applied to many of the heavily arpeggiated sections of the *Caprices*. This in itself makes the technique worthy of further investigation and development.

Figure 5 illustrates a practical example of how chordal picking functions in contrast to sweep-picking; one of the main differences is the execution of the plectrum strokes.

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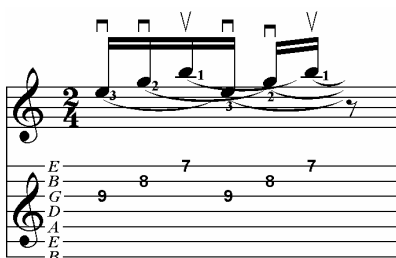
<sup>652</sup> Heard in ‘Orient Blue’, Al Di Meola, *World Sinfonia*, Tomato Records, INA600772, 1991.

<sup>653</sup> Heard in ‘Orient Blue’, Meola, *World Sinfonia*, 1991.

<sup>654</sup> Heard in ‘Evil Eye’, Malmsteen, *Rising Force*, 1984.



Figure 5



In sweep-picking string vibration occurs automatically as the plectrum is pushed from one string to the other whereas in chordal picking the notes are individually struck.<sup>655</sup> Although avoided within the technique of sweep-picking, these consecutive down-strokes can be extremely effective in the performance of arpeggiated chords with a sustained duration,<sup>656</sup> shown here by the use of ties.

One of the drawbacks of consecutive string repeated strokes is the limitation placed on velocity. Physical efficiency is a primary concern manifesting itself in an up-stroke on the final note of the arpeggio.<sup>657</sup> Similar in notational and functional form to that of sweep-picking, the up-stroke hand motion aids efficiency by reversing the motion towards the subsequent note.<sup>658</sup>

Another difference illustrated by the note ties is the length of the string vibrations in comparison to sweep-picking; the note is stopped only when it is re-struck to repeat the arpeggio. This continuous ring-on effect is characteristic of this type of picking, allowing most notes to reach their full duration and linking one arpeggiated chord to the next.

<sup>655</sup> Heard in 'Passion, Grace and Fire', Al Di Meola, *Passion, Grace and Fire*, CBS, Inc., CK 38645, 1983.

<sup>656</sup> Observed in Meola, *Masters Series*, 1991.

<sup>657</sup> Meola, *Masters Series*, 1991.

<sup>658</sup> *Ibid*

## 8.2 Finger picking techniques

### 8.2.1 Introduction

Many of the chords in the *Caprices* have been orchestrated using the plectrum. However, the technique of muting strings whilst fingering chords can be extremely difficult to master, necessitating alternative options notated in the *ossia* staff.

These options offer two of the more mainstream types of chordal playing; the plectrum finger combination technique of chicken-picking and the finger technique associated with nylon string guitar. These two techniques are closely related and employ a more exact system of finger and thumb assignment to specific strings than strumming technique.

This type of finger assignment facilitates increased accuracy, giving it a distinct advantage over the more randomized plectrum technique. One of the advantages of individual finger-per-string assignment is an increase in speed.

Finger technique and chicken-picking are employed in a very elementary form throughout the *Caprices*. They are almost always used to combat situations where multiple strings require muting and/or complex fingerings arise.

### 8.2.2 Chicken-picking

Chicken-picking,<sup>659</sup> which combines both plectrum and fingers, has the advantage of exploiting both timbres<sup>660</sup> and offers the performer a wide range of string tone variations.

<sup>661</sup> Its diversity allows the technique to be applied to many playing contexts from country music<sup>662</sup> (where the technique is widely used)<sup>663</sup> to jazz<sup>664</sup>, blues<sup>665</sup>, rock<sup>666</sup> and fusion.<sup>667</sup>

The lack of strict conventions allows for any of the free fingers not holding the plectrum to strike the strings.<sup>668</sup> The plectrum most commonly strikes the bass note, with the second, third and fourth finger placed on their corresponding strings.<sup>669</sup> Figure 6 illustrates the second, third and fourth fingers occupying the strings in ascending order, with the second on the lower string above the plectrum and the fourth on the highest string.

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<sup>659</sup> Morse, *The Complete Styles*, p12.

<sup>660</sup> Tom Wheeler and Steve Fisher, 'State of the Art Country Rock Guitar', *Guitar Player*, Vol. 15, No. 5, May 1981, pp. 30-52.

<sup>661</sup> Observed in Garsed, *Rock Fusion*, 1995.

<sup>662</sup> Observed in Mitch Merrett, 'Chicken-picking #4', <http://www.youtube.com/watch?v=9oT245PpsQk>; accessed 20<sup>th</sup> February, 2007.

<sup>663</sup> Steve Trovato, *Country Rock, Soloing Concepts*, R.E.H. Publications Inc., 1988.

<sup>664</sup> Observed in Tim Wallis, 'Pimpin Popcorn', <http://www.youtube.com/watch?v=EPCID4khywg>; accessed 20<sup>th</sup> February, 2007.

<sup>665</sup> Observed in Blues Architect, 'Blue Chicken', <http://www.youtube.com/watch?v=bnSIBKcJlXg>; accessed 20<sup>th</sup> February, 2007.

<sup>666</sup> Observed in Vincent, Vinnie. *Metal Tech, Style, Speed and Phrasing*, Seattle: R.E.H. Publications Inc., 1988. ; Becker, *The Legendary Guitar of Jason Becker*, 2007.

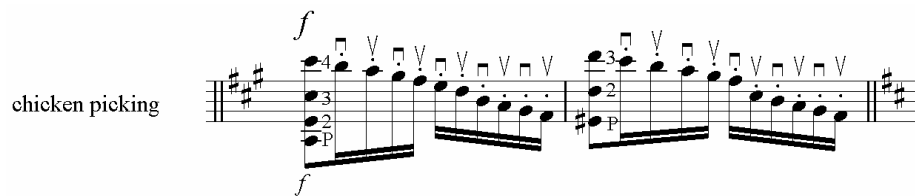
<sup>667</sup> Observed in Brett Garsed, 'Live', [http://www.youtube.com/watch?v=jed\\_mvEfZ0U](http://www.youtube.com/watch?v=jed_mvEfZ0U); accessed 20<sup>th</sup> February, 2007.

<sup>668</sup> Observed in Blues Architect, 'Blue Chicken', <http://www.youtube.com/watch?v=bnSIBKcJlXg>; accessed 20<sup>th</sup> February, 2007. ; Lane, *Power Licks*, 1989.

<sup>669</sup> Wheeler and Fisher, 'State of the Art Country Rock Guitar', pp. 30-52.

Figure 6

‘Caprice No. 10’, bar 47-48



This assignment represents a typical positioning of the fingers used in the *Caprices*. As can be seen in this example, the first chord is followed by alternately-picked three-note-per-string scalar motifs, not dissimilar to those found in the alternate-picking section. As the plectrum strikes the lower string with a down-stroke, it is then required to skip to the high B with another down-stroke. Each of the chicken-picked chords can be arpeggiated which gives the plectrum time to relocate during this process.

Given the assignment of individual fingers to strings, correct hand orientation is a high priority as it affects optimal finger positioning. In turn, hand orientation and overall positioning is dependent on the individual's ability to attain the necessary stretches which makes it variable.

In the *Caprices* both three-note and four-note chords can be struck simultaneously. However, if the objective is to mimic an arpeggiated bow stroke the assignment of individual fingers to strings makes this relatively easy.

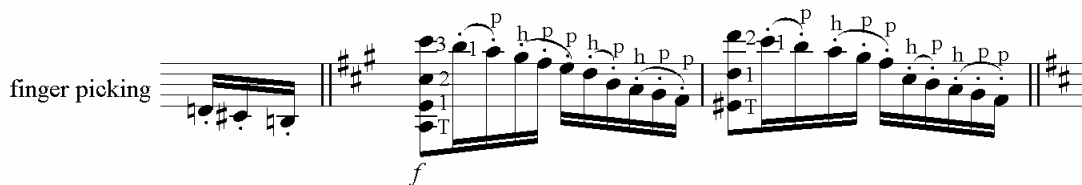
### 8.2.3 Finger-picking

Given the limited role finger picking plays in the *Caprices*, and the extensive literature on the technique that already exists, no more than a cursory explanation of it is needed here. In this technique the thumb strikes the lowest note in the chord with the fingers being assigned to the remaining strings.<sup>670</sup> A typical example of this technique can be seen in Figure 7,<sup>671</sup> with the additional use of hammer-ons and pull-offs to avoid complex plucking patterns.

Throughout the *Caprices* finger-picking only appears with its alternate technique, chicken-picking, in combination with hammer-ons and pull-offs.

Figure 7

‘Caprice No. 10’, bar 47-48



Unlike in the chicken-picking option shown in Figure 6, where all the notes are alternately-picked, Figure 7 utilizes one of the strengths of low electric guitar action: hammer-ons and pull-offs. By doing so, the development of scalar finger picking is unnecessary. However, the first finger is used to initiate the string vibration at the beginning of the each descending scalar pattern.

<sup>670</sup> Martin, *El Arte Flamenco De La Guitarra*, p. 20.

<sup>671</sup> *Ibid*

Unlike in chicken-picking, the first finger does not hold the plectrum, which frees it up for generating string vibrations within the chord. As with chicken-picking, the chords can be arpeggiated allowing time for the first finger to reposition itself to start the string vibration needed for the descending scalar motif.

One of the largest problems facing the finger technique is the player's ability to change seamlessly from using the plectrum to finger technique and back again. The plectrum, therefore, requires relocation to a position from which it can easily be recovered once the passage has been played. The two positions mentioned previously in the hammer-on and pull-off chapter are between the first and second knuckle of the thumb and between the first and second knuckles of the second finger. Two of the principal reasons for correct placement are unrestricted finger movement and instantaneous plectrum recovery.

Achieving the balance between placing the plectrum, so as not to restrict finger plucking whilst ensuring that it will not be dropped, can be extremely difficult. The speed at which the plectrum placement and recovery can be executed dictates whether utilization of the finger picking nylon string technique is a feasible option.

### **8.3 Chapter summary**

Chord playing makes up a substantial enough portion of the transcriptions to warrant an independent chapter explaining its contextual application within the *Caprices*. The *ossia* staff variants of chicken-picking and finger-picking provide an easier option to the more difficult plectrum-strummed technique.

The difficulty lies in the need for a single finger to mute its upper adjacent string whilst cleanly fretting the note. This can be very challenging, especially when combined with

rapid chord changes, unorthodox fingerings and the need for multiple string mutes.

These factors are a by-product of the transcription process which makes chord shapes that comfortably lie under the fingers on the violin less accommodating on the electric guitar.

The three basic chord-striking techniques used in the transcriptions are plectrum only, plectrum and fingers (chicken-picking), and fingers only. All three have advantages and disadvantages in their use, the biggest determining factor being the guitarist's ability to change between techniques.

As utilization of the plectrum to play chord shapes requires virtually no preparation it is the preferred option in most instances and this is reflected in its central position in the score. The chicken-picking alternative requires a settling of the hand down onto the strings so that the fingers not holding the plectrum can be assigned to individual strings.

This technique requires only slightly more preparation time than the standard plectrum strum previously mentioned. However, the nylon string finger picking technique, although familiar to classical guitarists, poses a difficult challenge owing to the need to master the technical problems associated with plectrum placement and recovery.

All three methods of chordal picking can be used separately or in combination with other techniques. The degree of success is dependent on individual preferences and physical attributes.

As with all techniques, mastering chordal passage playing requires consistent practice and technical modification, with each solution dependent on the individual: there is no one “correct” technique.