

# Perfect 10s

## Observations and Development of Extended Interval Usage in Four-Mallet Keyboard Percussion

By Nicholas Papador

There is no such thing as a Perfect 10th interval, and perfecting major and minor 10th intervals, when they occur within one hand in keyboard percussion literature, is also no easy task. This article provides a general overview of the use of compound intervals in four mallet marimba/vibraphone playing and details the following: precedents for the development of extended-interval four-mallet technique; hand positions to achieve comfortable intervals wider than an octave; exercises to develop larger intervals and fluid transitions between large and small mallet reaches; and excerpts of original compositions that utilize 10th intervals.

### ACOUSTICAL AND HISTORICAL PRECEDENTS FOR DEVELOPMENT OF TENTH INTERVALS

Composing for the marimba using intervals larger than an octave between the hands is a subject of some debate. For many beginning and intermediate four-mallet players, achieving wide mallet spreads can be difficult. Even those who can comfortably make the reaches have difficulty projecting sound with the same integrity as with comfortable intervals of thirds to sixths. Even some professional players, when commissioning new works for the instrument, may specify that passages of active playing should contain no intervals wider than a sixth unless the texture is sparse enough to allow adequate time to prepare intervals such as sevenths and octaves. It's arguable that many marimbists generally prefer not to see intervals over an octave in their music at all.

It is questionable, therefore, whether performers should make a concerted effort to make these expansions to their range on the instrument. But as I will expand upon later in this discussion, the usage of 10th intervals is essential in transcriptions as well as in selected keyboard percussion repertoire, and extended interval scoring can contribute to acoustically clearer voicings of four-mallet sonorities.

The development of intervals larger than an octave in four-mallet marimba playing is not

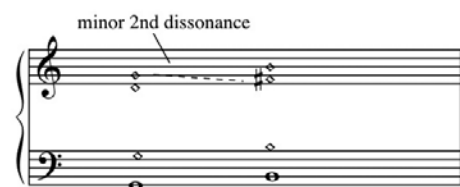
an attempt to situate the Musser and Stevens grips as a superior playing technique, yet because this grip has more of the mallet shaft length in front of the gripping point, the technique certainly has advantages in these particular conditions. Much of the ensuing technical discussion is specific to Musser/Stevens technique, but some general cross-grip guidelines are addressed. Traditional and Burton grip players working with wide interval passages should also consider the included exercises and examples for training the hands to handle this type of mallet leverage. Developing 10th intervals is also not a means of mastering a more pianistic technique at the marimba, in spite of the fact that virtuoso Romantic piano works and concerti certainly created barriers to entry for players without large hands or sufficiently developed stretches for wide interval chording.

Compound interval scoring within a single instrument has its fundamental basis in early voice leading and acoustical principles. When part writing chorales or creating counterpoint in traditional music theory, it is commonly noted that if the bass in a four-part structure is written below the bass clef C ( $C_3$ ), the tenor voice should be no closer than a perfect fifth above the bass. Acoustically speaking, the overtone structures of lower pitches are more audible to the human ear. The lower tones on the marimba in particular, are generally more resonant and have a longer decay profile.

In Figure 1, we see the fundamental pitch and first three harmonic overtones of the pitches  $G_2$  and  $B_2$ , a major third occurring below  $C_3$ . The third partial of  $G_2$  and the second partial of  $B_2$  form a dissonant minor 2nd interval between the G and F-sharp. By scoring a major 10th using  $B_3$ , the relationship between the G and F-sharp overtones is a major 7th, which is less dissonant. Major thirds in higher registers exhibit the same overtone interactions but are generally not noticeable, having much less audible overtones, but at this lower pitch level, the third is perceived as sounding "muddy." When we look at the chorale harmonizations of J.S. Bach, we commonly see 10th

intervals (sometimes wider!) between the tenor and bass voices that have been employed in order to keep upper voices within an octave or avoid part writing errors such as parallel perfect consonances, voice crossing, or voice overlap. In addition to the voicing concerns, the bass voice in a four-part setting should have interesting melodic content second only to the soprano, often requiring less conjunct motion than inner voices.

Figure 1: The fundamental and first three harmonic overtones of pitches  $G_2$  and  $B_2$



Finally, on the physical side of things, as the notes get lower on keyboard percussion instruments, they usually get wider. So as musicians our need for wider intervals falls in the left hand, where it is more difficult to achieve them. The following hand-positioning guidelines are useful for compound intervals and for smaller intervals than can benefit from the physical leverage within the hands in the lowest octave of the marimba.

### HAND POSITIONING FOR EXTENDED INTERVALS

Traditional interval shifts by rolling the inside mallets (mallets 2 and 3) across the index finger may not suffice in shaping 10th intervals. Intervals roughly an octave or wider become cumbersome and, at this point, many players remove the thumb from the inside mallet gripping point, which destabilizes both the accuracy and sound production of the stroke. It is necessary then to shift the placement of the inside mallets within the palm to create large intervals that have the proper grip in place to support the mallets. In a comfortable carrying

position in the Musser/Stevens grip, the end of the inside mallet rests near the center of the palm. For extended intervals, the end of the inside mallet will move to the top of the hand at the base of the middle and ring fingers (see Figure 2).

In the extended position, the mallets will rest on the first joint below the middle fingertip, and the end of the mallets will be tucked below the middle-finger base. You should be able to let the mallet hang independently without your thumb and forefinger if the positioning is correct (see Figure 3). Additional information about extended interval positioning can be referenced in Leigh Howard Stevens' text, *Method of Movement*.

Now that the hand positioning has been detailed, we must establish how the performer moves fluently between standard and extended hand positions. Repertoire containing 10th intervals often contains shifts from a standard interval to an extended interval—namely, chorale structures in Bach and Schuman transcriptions. The interval changes must be executed quickly and accurately in order not to affect the sound and phrasing of the music.

The first step in mastering the extended interval shift is to “throw” the inside mallet. To coordinate this motion within the context of playing technique, “throw” the inside mallet, and instead of letting go of the stick, give the

mallet head an arch motion as it extends inward. Discard the inner mallet with the thumb, index and middle finger while keeping the outside mallet steady within the ring and little fingers. When the butt of the mallet reaches and rests at the base of your middle finger, the extended position has been achieved. When in this position, the butt of the inner mallets may be touching the lower shaft of the outside mallet.

The motion of the mallet butt moving along the base of the palm is the same as detailed in *Method of Movement*; the concept of using a throwing gesture with the mallet was suggested

Figure 3: View of extended position with the thumb and forefinger removed to show the inside mallet resting at the lower base of the middle finger



Figure 2: View from above and below the hands with mallets in the standard carrying position and in the extended positions



## PAS THANKS ITS INDIVIDUAL FRIENDS

Jose Alicea  
 Ruben P. Alvarez  
 Anders Astrand  
 Jim Atwood  
 John R. Beck  
 Joel Bluestone  
 Jerry J. Bolen  
 John Bosworth  
 Ruth Cahn  
 Steven Day Carter  
 David R. Ciarvella  
 Terry Clark  
 Gary Cook  
 Mark Craig  
 Jeffrey Davis  
 Diane Downs  
 Noel Eccles  
 Jim Guglielmo  
 Emily Annette Hill  
 Rev. Dr. George A. Hill III  
 George Aldrich Hill IV  
 Richard Holly  
 Christopher Karabin  
 Michael G. Kenyon  
 Mark Kohler  
 Steven Machamer  
 Robert M. McCormick  
 Jack H. McKenzie  
 William Moersch  
 Ken Murphy  
 Valerie Naranjo  
 Christopher S. Norton  
 Donald Prorak  
 Peter Pruitt, CPA  
 Dave Riecken  
 Lisa L. Rogers  
 Jim Royle  
 Mark W. Schafer  
 Alison Shaw  
 Aaron F. Snyder  
 Karolyn Stonefelt  
 Doug Tann  
 Chris W. Treloar  
 Ruth K. Underwood  
 Henry Van Den Abbeelen  
 Lauren Vogel Weiss  
 Paul Walker  
 Kelly Wallis  
 Gregory W. White  
 Barry A. Zimmerman

to me in my studies with Michael Burritt. The addition of this gestural analogy can make for smooth and direct transitions to wide intervals without unnecessarily gradual or awkward shifting. From here, you can make adjustments for octave and compound intervals you wish to strike. With the support of this extended grip within the hands, be sure to keep your thumb and forefinger properly placed on the mallet. This is essential for accuracy and sound projection and the reason this extended mallet positioning is being utilized.

For cross-grip players, this “throw” to the extended position described here can be substituted with the removal of the ring finger from the back fingers. The back fingers in Burton and traditional grip are largely responsible for the inside mallets in wider intervals. Removing the ring finger and letting the fifth finger support the inside mallet may allow for extended and supported intervallic reaches. More information about interval manipulation specific to traditional grip can be found in Nancy Zeltsman’s text, *Four-Mallet Marimba Playing: A Musical Approach for All Levels*.

#### TECHNICAL EXERCISES FOR TENTHS AND INTERVAL SHIFTING

The following exercises are designed to develop interval shifting within the hands and to incorporate the inside mallet throw to extend intervals to the octave and major 10th. One could certainly create additional exercises incorporating 10ths that involve holding the wide intervals while executing single independent strokes or playing double vertical strokes in 10ths using ascending and descending diatonic scales; however, these exercises are restricted to those that promote interval control and getting to and from the extended hand position. These exercises are meant to enrich your current four-mallet technical warm-ups, not to replace them with routines that devote extensive attention to concepts that are not part of the keyboard percussionist’s everyday use.

Exercises 1a and 1b are arpeggiations from 3rds to 10ths using double vertical strokes and should be performed with both hands separately. As indicated in the exercise, the thumb, forefinger, and middle finger will throw the inside mallet into the extended position while making the interval change from the fifth to the octave. While the octave can be played from a standard hand position, striking an accurate 10th will be more consistent if the transition is prepared further in advance. Octaves played in the extended position also have a supported sound and it is an efficient way to lock the interval spread for musical passages containing stretches of consecutive octaves.

In Musser/Stevens grip, it is predominantly the inside mallets that move to adjust for interval spreads. In the case of Exercise 1a, when played with the right hand, mallet number 4 is playing the musical moving voice. Physically

Figure 4: Process of “throwing” the inside mallet from the standard to the extended position



**Exercise 1a** Beginning tempo ♩ = 60 or slower Continue ascending chromatically through all 12 keys

o = “throw” inside mallet into extended position  
+ = return inside mallet to standard carrying position

**Exercise 1b** Beginning tempo ♩ = 60 or slower Continue ascending chromatically through all 12 keys

The image contains two musical staves, Exercise 1a and Exercise 1b. Exercise 1a is a treble clef staff with a sequence of notes: C4, E4, G4, A4, B4, C5, D5, E5, F5, G5, A5, B5, C6. Exercise 1b is a bass clef staff with a sequence of notes: G2, B2, D3, E3, F3, G3, A3, B3, C4, D4, E4, F4, G4. Both exercises include a legend for the symbols 'o' and '+', and instructions to continue ascending chromatically through all 12 keys.

speaking, however, the inside mallet and the forearm are making most of the motions. If Exercise 1a is played by the left hand, mallet number 3 is both making the physical motion and is the moving musical voice. For this reason including Exercise 1b ensures that each hand trains both movement scenarios described above.

Exercises 2a and 2b break up the double stops using single alternating strokes. Although the double stops are now separated, the physical demands are equal. It is imperative that the static mallet (example: mallet number 1 in Exercise 2a played with the left hand) remains over the target note even while the other mallet is playing. This will promote better intervallic training and greater general accuracy due to the minimizing of horizontal forearm motion. However, I do suggest the use of the “pull offs” and “push ups” by moving the elbows forward and backward while using broken 10th dyads (or any broken two-note dyad) with both a

black and white key. For example, if one is playing the second measure of Exercise 2a in the left hand, the F natural is struck with mallet 2. Then the elbow pushes the arm forward over the accidental bars for mallet 1 to strike the D-flat, rather than shifting the hand position to the left. This is true of both the 10ths and the 3rds in this measure. If playing the arpeggio on D major, mallet 2 strikes the F-sharp and the elbows pull back over the natural keys before mallet 1 strikes the D. The idea here is to have options available for broken arpeggiations that reduce the amount of choreography needed in hand and body positioning. Additional information on push ups and pull offs may be referred to in my previous article, “Singles, Doubles, Triples: Rudimental Building Blocks as Applied to Four-Mallet Keyboard Technique” (*Percussive Notes* 42:4, August 2004).

These concepts remain the same in Exercises 3a and 3b. The double dotting of the rhythms

**Exercise 2a** Beginning tempo ♩ = 60 or slower Continue ascending chromatically through all 12 keys

**Exercise 2b** Beginning tempo ♩ = 60 or slower Continue ascending chromatically through all 12 keys

**Exercise 3a** Beginning tempo ♩ = 60

**Exercise 3b** Beginning tempo ♩ = 60 Continue ascending chromatically through all 12 keys

requires the use of double lateral strokes, which require a single downward wrist motion followed by a wrist rotation.

It should be restated that while one can cre-

ate a number of more elaborate compound interval exercises, the importance of hands-apart practice on the basic tenants of wide interval training cannot be overstated. While these

exercises can certainly expand our general facility with the mallets, it is not advisable to overemphasize training with extended-position intervals, which is not seen in the majority of marimba and vibraphone repertoire.

### MUSICAL PASSAGES FEATURING EXTENDED INTERVALS

Following are excerpts from recent original compositions that have passages using compound intervals. Extracted from the scores, these passages provide a means of play testing the technical concepts outlined above and also demonstrate the aesthetic voicing possibilities through use of the technique.

“Voduophidian” is a recent piece by Marassa Duo that develops several melodic structures and drumming rhythms found in Haitian Vodou songs dedicated to the lwa (deity) Damballah, who is represented as a snake in iconography. The title is a play on the words *vodou*, *duo*, and *ophidian* (meaning snake-like). The piece uses key signatures as a type of symbolism for spiritual ascension. The original music is in the key of C minor, but when folkloric melodic quotations appear, the keys raise like a spiritual ascension, which culminates in a moment of epiphany featuring scoring for an assortment of exotic bells and a marimba chorale hymn. The music then returns to the home key and builds in speed and overall tessitura,

- Intensive professional training with a superb liberal arts education
- Internationally recognized faculty and low student/teacher ratio
- Advanced technological support for faster skill and musical development
- New, state-of-the-art classrooms, studios, and performance halls—a new dimension in the learning experience



#### Blair Percussion VORTEX

William G. Wiggins, M.M., Associate Professor of Timpani  
Principal Timpanist, Nashville Symphony Orchestra  
Michael Holland, Senior Lecturer in Percussion

# VANDERBILT UNIVERSITY

#### For more information:

Dwayne Sagen  
Assistant Dean for Admissions  
Blair School of Music  
Vanderbilt University  
Nashville, TN 37212-3499  
PHONE: (615) 322-6181  
WEB: [www.vanderbilt.edu/Blair](http://www.vanderbilt.edu/Blair)  
E-MAIL: [Dwayne.P.Sagen@vanderbilt.edu](mailto:Dwayne.P.Sagen@vanderbilt.edu)



#### AUDITION DATES 2010/11

December 4, 2010 • January 28-29, 2011  
February 11-12, 2011 • February 25-26, 2011

- Degree programs offered in instrumental and vocal performance, composition/theory, and musical arts—and a five-year Bachelor of Music/Master of Education program
- Ranked as one of the nation's top twenty universities

**M Driving and Intense** ♩ = c. 132

The musical score for 'Driving and Intense' is written for piano in 8/8 time. It features a complex texture with dense sixteenth-note patterns in the right hand and a steady, rhythmic accompaniment in the left hand. The piece starts with a fortissimo (ff) dynamic and includes a section marked 'dolce' (softly). The tempo is indicated as approximately 132 beats per minute.

Excerpt from "Voduophidian" (2008) by James Armstrong and Nicholas Papador.  
Copyright ©2008 House Panther Press. All Rights Reserved. Used by Permission.

**C Resonant and Gentle** ♩ = c. 48

The musical score for 'Resonant and Gentle' is written for piano in 4/4 time. It features a slow, resonant texture with wide intervals and a one-handed roll in the right hand. The piece starts with a pianissimo (ppp) dynamic and includes a section marked 'p' (piano). The tempo is indicated as approximately 48 beats per minute.

Excerpt from "A Very Welcome" (2010) by Nicholas Papador  
Copyright ©2010 Keyboard Percussion Publications by Marimba Productions Inc. Used with Permission.

attempting to achieve this epiphany once again. Unable to do so without the folkloric melodies, the piece works into a yearning fervor that concludes with the marimba crashing into its lowest pitch register.

This excerpt is an interlude that precedes the conclusion of the piece. The right hand is playing a traditional Afro Haitian bell rhythm on a perfect fifth based on E-flat. The left hand is scored in gradually ascending diatonic 10ths in E-flat major key area. Each eight-bar phrase has the left hand gradually increasing in relative speed from two strikes per bell pattern to four. This tendency for the left hand to accelerate and the gradual rising in range using the right hand as the point of resolution give the passage a generally yearning affect, which is quickly frustrated by the cascading disintegration of the pattern into rehearsal letter N. In addition to using compound intervals, the excerpt explores varied rhythmic groupings played against a bell rhythm, so the independence between the hands adds an additional challenge.

"A Very Welcome" is a short "encore" piece that I composed in honor of my wife to celebrate the birth of our son. Stylistically, it is reflective tonal work in the style of Emmanuel Sejourne's "Nancy" or Michael Burrirt's "The Offering." The piece began as a technical etude specifically to develop the use of extended 10th intervals. The following passages require wide spreads of the arms as well as within the mallets in each hand, which elicits a sense of virtuosity based on delicacy rather than on power or speed.

The first example comes from a spacious arrival point in the piece featuring an independent roll drone in the left hand while the right hand plays a primarily A-flat Lydian recitative style melody in 10ths. In addition to maintaining wide intervals and a one-handed roll, the distance between the two hands requires strategic posture and body positioning to maintain a consistent musical texture.

The second example is comprised of swells and pulses in a fast 6/8. The example begins on the third of three swells with double stops in the left hand and contrasting permutations in the right hand. At the climax of these three swells, the left hand begins a series of descending patterns in diatonic 10th intervals. I include a breath mark at the end of the first system to allow time for an accurate mallet throw into the extended hand position.

## CONCLUSION

The use of one-handed compound intervals in early Common Practice keyboard works was a means to keep voicing acoustically clear and to keep part writing and counterpoint customs intact. It was not necessarily a means to create climactic gestures or to advance the technical aspects of the music. Because reaching compound intervals within one hand on the ma-

**Driving and Intense** (♩ = c. 132)

Excerpt from "A Very Welcome" (2010) by Nicholas Papador  
 Copyright ©2010 Keyboard Percussion Publications by Marimba Productions Inc. Used with Permission.

**Dr. Nicholas Papador** is Assistant Professor of Percussion at the University of Windsor. An active performer specializing in contemporary music, he is a founding member of Marassa Duo and Noiseborder Ensemble, and was recently featured as on-screen performer in Matthew Barney's *KHU*, act 2 of his seven-part film/opera *Ancient Evenings*. He has received grants and awards from the Ontario Arts Council, Canada Council for the Arts, and Canada Foundation for Innovation. He can be heard on CBC Radio, Ludwig/Elf, and RIAX labels, and his second recording with Marassa Duo is forthcoming. His compositions appear with Keyboard Percussion Publications, Alfred Publications, Studio 4 Music, House Panther Press, and Bachovich Music. Papador has presented at two PASICs and is president of the PAS Ontario Chapter. PN

rimba or vibraphone is at the periphery of our technique, use of these intervals, in the chorales of Bach or Stevens' transcription of Schuman's "#30 (Untitled)" from *Album for the Young*, are often interpreted as climactic or as a place where uncharacteristic rubato is employed. In these instances, the extended intervals are often on weak beats and are transitional in nature rather than cadential. For this reason, the included exercises and concepts are offered here to enhance our range and make these passages fluid and accurate to the intentions of the musical line.

Contemporary pieces written for our instruments such as David Maslanka's "My Lady White," Dave Hollinden's "Of Wind and Water," and Linda Catlin Smith's "Invisible Cities," among others, have actively incorporated compound intervallic usage or embraced occasional wide voicings to elicit certain timbral qualities. Examples of my own writing included here seek to foreground the sublime possibilities of 10th intervals in active and idiomatic textures. In the case of accurately executing transcriptions or meeting the challenges of certain contemporary scores, the above discussion and exercises should provide a solid starting point in creating the Perfect 10th.

#### BIBLIOGRAPHY

Forte, Alan. *Tonal Harmony in Concept & Practice* (3<sup>rd</sup> Edition). Fort Worth, TX: Holt, Rinehart and Winston, Inc., 1978.

Papador, Nicholas. "Singles, Doubles, Triples: Rudimental Building Blocks as Applied to Four-Mallet Keyboard Technique." *Percussive Notes*: 42:4 (August 2004), 48–56.

Stevens, Leigh Howard. *Method of Movement for Marimba* (5<sup>th</sup> Edition). Asbury Park, NJ: Keyboard

Percussion Publications, 2000.

Turek, Ralph. *Theory for Today's Musician*. New York: McGraw Hill, 2007.

Zeltsman, Nancy. *Four-Mallet Marimba Playing: A Musical Approach for All Levels*. Milwaukee, WI: Hal Leonard Corporation, 2003.

NEW

Meet Randy Max at PASIC

November 10-13, 2010

Indianapolis, IN

## ORCHESTRAL EXCERPTS FOR TIMPANI

with an audio CD of orchestral performances of each excerpt, plus practice tracks

Selected and Annotated by **RANDY MAX**  
Principal Timpani  
Rotterdam Philharmonic  
Catalog #414-41194

"Randy Max's *Orchestral Excerpts for Timpani* examines the repertoire from every angle... contains many invaluable ideas on practicing excerpts, audition preparation, and ear training. An essential resource for any student or professional." – Matt Perry, Royal Philharmonic Orchestra,  
Royal College of Music, Trinity College of Music

Theodore Presser Company • [www.presser.com](http://www.presser.com)