

## 2. general notation

Percussion instruments do not speak nearly as well as the strings of traditionally bowed instruments so a gradual swelling dynamic is most easily executed. A sharp attack on the start of a bowed note is almost impossible (unless struck with a mallet). Sustaining a loud note for an extended period of time or managing two different dynamic shapes with two different bows is very difficult to execute. This figure is most natural:



[Figure 2.40]

The bowed sound and the resonating sound can be notated separately; this is the most accurate notation. It can be done with note lengths or, on vibraphone, with pedal indications.



[Figure 2.41]

Bowing takes time and is a bit awkward, so fast passages are not possible. The composer should allow time for the performer to pick the bow up, get it in place, make the instrument sound, and put the bow down. On mallet instruments, more time is required to move the bow from the “white” notes to the “black” notes. To do so the player must lift the bow up and over the instrument to the other side before getting it into position for the next note. Also, when bowing the accidentals, the music stand can often get in the way, and extra time may be necessary to maneuver around it.



[Figure 2.42]

When a bow re-attacks an already ringing note, it will tend to dampen the instrument before making it sound again. A smooth re-attack is possible but difficult. As a result, especially long bowed notes may not work since the bow changes may be too apparent. The bow's tendency to dampen can be used as an effect, especially with vibraphone where one can stop the bow short to immediately dampen the sound. This is like a dead stroke (or dead bow) - see *Dead Stroke*.

Multiple players with two bows each could be used to execute more complicated bowed passages (see Steve Reich's *Sextet*). For example, two players can play on either side of a vibraphone - one bowing the naturals and the other bowing the accidentals.

Bowed cymbals, unpitched gongs, and thundersheets will produce a pitch (or several pitches) from the harmonic spectrum of the instrument. The pitch(es) produced vary depending on the speed of the bow, the volume, the spot on the instrument that is bowed, the place the instrument is held by the other hand, and how much of the instrument is muffled by the holding hand or stand. With all the

variables, many different pitches can be created on one instrument, but unfortunately they cannot be controlled. The pitch is very unpredictable, and it is unreasonable to request specific pitches, specific pitch relations, or even a consistent pitch.

Keyboard instruments, tuned gongs, triangles, cowbells, agogo bells, almglocken, Japanese temple bowls, and crystal glasses will have a definite and constant pitch when bowed. Flexatones will have a definite pitch, which will bend as the tension of the metal is manipulated.

The number of bows needed should be specified in the instrument list.

### **Articulation and phrasing**

Although true legato and control over different articulations cannot be achieved on most percussion instruments, articulation and phrasing markings can still be helpful. Percussionists can realize these notations through dynamics, beating spot (where the instrument is struck), and mallet choices. A composer should not hesitate to write slurs into a glockenspiel or even a snare drum part; the slur sound can still be achieved even though each note must be articulated. The effect will not be as apparent as it would be on a clarinet, but these notations will make a difference.

On resonant instruments with pitch bend capabilities, such as timpani or flexatone, a true slur can be executed by striking the instrument once and then changing the pitch. This effect is dependent on the volume of the resonance - the further the slurred note is from the original articulation (in time and in interval), the softer it will be. A slur alone will not indicate a glissando; glissando must be notated separately.

Rolls can connect notes and create a slur-like effect.

### **Dead stroke**

A *dead stroke* is achieved by holding the mallet on the instrument after the attack to dampen the vibration. Dead strokes are commonly notated with a plus sign (+) over the note. Ringing notes in a passage with dead strokes can be indicated with a circle (o) over them; this is not necessary but can help to clarify. "D.S." or staccato dots are other common indications for dead stroke. These notations are not standard and should be explained at the top of the score and part.

Dead strokes take more time to execute than normal strokes since the mallet head needs to spend more time on the instrument. The faster a dead-stroke passage moves, the less effective it will be.

With drum sticks, wood mallets, plastic mallets, and hard rubber mallets, dead strokes will create a buzz sound as the beater bounces quickly on the instrument (like the bounce of a buzz roll). Mallets wrapped with yarn, cord, and felt have a soft layer of material to cushion the attack and eliminate the bounce. This buzz can be avoided by using wrapped mallets (e.g., instead of plastic mallets, very hard yarn or cord mallets could be used) or by wrapping a layer of masking tape around the mallet head.

Dead strokes can be used as short notes on marimba or vibraphone to contrast with the resonating normal strokes (see Steven Mackey's *See Ya Thursday*). On drums they will sound harsher and will raise the pitch slightly as the drum head is stretched by the pressure of the dead stroke.

### **Note lengths**

#### **Exact or inexact note-length indications**

Exact note-length indications are not always necessary. Percussion parts will often have approximate note lengths since some instruments only ring for a short period of time. As a result, percussionists are accustomed to making decisions about when to stop an instrument from ringing.

## 2. general notation

For the most control over note length, exact note lengths can be written (as one would for piano music) with an indication at the beginning of the part that note lengths should be accurately observed. For less specific notation, indications can be used only when necessary (for cymbals and other resonant instruments). An “l.v.” (*laissez vibrer*, let vibrate) or an open slur can indicate to let the instrument ring, and a coda symbol, two slashes, or the word “cut,” “choke,” “damp,” or “secco” can be used to indicate dampening.



[Figure 2.43]

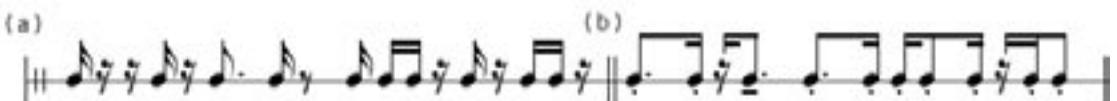
Some instruments have little or no natural resonance. For these instruments, note length does not need to be notated exactly; a whole note will not ring any longer than a sixteenth note. Note length will not change unless the instrument is dampened while it is struck. Sometimes note lengths are important to indicate dynamic and timbral phrasing, but the actual length of the note will not be influenced. These instruments are:

- snare drum and high pitched drums
- xylophone
- vibraphone with pedal up
- wood/temple blocks
- claves
- cajón
- slapstick
- castanets
- tambourine
- maracas/shakers

Some other instruments have a little resonance that can be controlled through dampening but are generally left to sound for their full lengths. If accurate short durations are desired for special articulation effects, then dampening can be notated. These instruments are:

- medium pitched drums
- marimba
- log drum
- cowbells, agogo bells, almglocken
- brake drums, anvils
- metal pipes
- finger cymbals
- rice bowls
- vibraslap

In the above two categories, notation of accurate note lengths may be more trouble than it is worth. Excessive rests can clutter a part and make it very difficult to read (see Figure 2.44a). If inexact note lengths create phrasing problems, articulations can substitute (see Figure 2.44b).



[Figure 2.44]



## Stacked instruments

Mallet instruments can be stacked one in front of the other to be played at the same time or in quick succession. Marimba and vibraphone are commonly stacked (see Charles Wuorinen's *Percussion Duo*) with the vibraphone in front so the pedal is accessible (see Figure 6.9). Occasionally marimba can be positioned in front of the vibraphone with the vibraphone pedal extended, but the former configuration is most common. The marimba/vibraphone combination is perfect because the same mallets can be effectively used on both instruments. Xylophone and glockenspiel also stack well for this reason.

With stacked instruments, the instrument furthest from the performer should be notated on top. With the setup shown in Figure 6.9, the staves for the marimba would be on top even though the marimba's range extends far below that of the vibraphone (see Figure 6.10).



[Figure 6.9]

[Figure 6.10]

[From Ryan Streber's *Rondel*]

A smaller marimba (low A [4.3-octave] or low F [4.5-octave]) instead of a full 5-octave is far better if fast difficult passages are written between the instruments. The reach over the vibraphone can get tricky with the 5-octave, and the mallets necessary for the vibraphone are not ideal for the lowest register of the marimba. In general, it is best to avoid writing difficult passages for the instrument furthest from the player.

Many more logistical problems can arise with stacked instruments than with just a single instrument. To be safe, it is best to request only one instrument per hand at one time. If a keyboardist plays a

piano and a synthesizer at the same time, he or she cannot be expected to play both instruments at the same time with one hand. The same is true here. With stacked instruments, one cannot be exactly sure what will be in reach depending on the size of the instruments and how they are set up in relation to each other. For this reason, if a chord has three notes on the marimba and one note on the vibraphone, it may or may not be reachable. It is acceptable to have four notes on the marimba, four notes on the vibraphone, or two notes on each (see Figure 6.11).



[Figure 6.11]

When stacked, only the “white” notes of the vibraphone are exposed to bowing. If “black” notes need to be bowed, the vibraphone must be pulled away from the marimba. This would require about five seconds. If the vibraphone is stacked behind the marimba with the pedal extended, bowing either side is unreasonable.

### Rolls

Rolls with hard mallets, like those used for xylophone, glockenspiel, and crotales or rolls in the upper register of marimba will always sound “beat-y”; that is, the individual strokes will be heard. Rolls can be seamless with softer mallets in the mid and lower register of the marimba, and under ideal conditions, rolled four-note chords can sound like an organ. With sustaining instruments such as vibraphone, glockenspiel, crotales, and chimes, the use of rolls is more of an effect than a necessity. For detailed information on rolls, see **General Notation**.

### Balance problems

The sound of glockenspiel, crotales, and xylophone cuts through an ensemble, and chimes can usually power their way through. The sound of marimba and especially vibraphone blend very well and tend to get covered in an orchestral setting. Harder mallets and stronger dynamics can help. The pulsing of the vibraphone’s motor can also be used to make the instrument’s sound more conspicuous (in the same way a blinking light is more noticeable than one that stays constant).

### Overtone interference

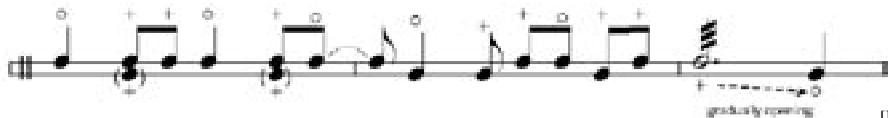
The composer should be aware that on a 5-octave marimba, the notes in the lowest octave have very strong and clear overtones; three octaves and a major third above (a major 24th) is especially apparent. If a minor tenth (or m17th, m24th, etc.) is struck, the dissonance between that interval and the overtone is very audible. It sounds almost as if all three notes had been struck. This applies to elevenths, eighteenthths, etc. as well.



[Figure 6.12]



The pedal must be depressed when the top line changes from open to closed, so the two motions (striking the cymbals and depressing the pedal) happen at the same time. For this, a closed foot stroke in parentheses can be notated simultaneously with the closed hand stroke. Figures 7.4 and 7.6 sound almost identical.



[Figure 7.6]

### Crash cymbals

Crash cymbals come in many different sizes and thicknesses. In addition to the timbral characteristics of cymbal size and thickness (explained in Tone Color), thicker crash cymbals will have a shorter, more articulate, and harder attack, while thinner cymbals will have a longer and softer attack. The type of cymbal used is not usually specified by the composer; if anything, a “large” or “small” pair of cymbals is indicated. (See Mahler’s and Shostakovich’s Symphonies, Tchaikovsky’s *Romeo and Juliet Overture*.)



[Figure 7.7]

### Ring

An undampened *fortissimo* crash will reach *piano* in up to four seconds. A *piano* crash will be inaudible after about a second and a half. The ring of the cymbals is controlled with muffling which is executed by bringing the edges of the cymbals in to the player’s torso.

### Pick up/put down time

Crash cymbals will make noise if they are not put down carefully, so enough time (about two or three seconds) must be allotted for the performer to pick up or put down these instruments. The cymbals must be held to allow them to ring; therefore, with long notes, the composer must take into account the ring time of the cymbals before giving the performer time to put them down.

### Speed

Crash cymbals are heavy and awkward instruments that require a lot of energy to play. Very fast articulations should be avoided and very quick changes to softer dynamics (*subito pianos*) may be difficult. The ability of a performer to execute a fast passage is proportional to the size of the cymbal - the smaller the faster.

### Crash articulations

Just as the length of the cymbal resonance can be controlled, so too can the length of the attack. By letting the cymbals sizzle against each other for a split second after the crash, one can elongate the attack. By pulling the cymbals apart immediately after the crash, one can make the attack more articulate. These articulations are not usually notated.

A scrape with the edge of one cymbal against the inside face of the other might be appropriate for soft long notes. This creates a long swish that is not very loud. A second or two is needed to get the cymbals in position for a crash cymbal scrape.

### Rolls

Crash cymbal rolls are rarely used. Where they are notated in pieces by Bartók, Mahler, Copland, and others, some percussionists argue that the composer was actually indicating a suspended cymbal roll. Regardless, this type of roll is now a part of percussion playing.

A loud crash cymbal roll can be achieved by rapidly striking the cymbals together, but this is difficult to execute consistently and can tire the player quickly. For softer crash cymbal rolls, the cymbals can be held together and moved against each other in a circular motion. Again, consistency is difficult. A far more effective crash cymbal roll requires two people: one person holds the cymbals together parallel to the floor while the other person rolls on them with mallets like a suspended cymbal. For this technique, some time is needed to get the cymbals into position. A hi-hat stand can be used to make this type of roll possible to execute with just one person.

### Mounting crash cymbals on a hi-hat stand

Small hi-hat cymbals can be replaced with larger crash cymbals, and soft crashes can be executed with just one hand or foot without any pick up/put down time needed. Also, a hi-hat stand can make the aforementioned crash cymbal roll possible to execute with just one person. Loud crashes are not possible on a hi-hat stand.

### Bass drum/cymbal attachment

Bass drum and crash cymbals can be played by one player with a bass drum/cymbal attachment. A bass drum/cymbal attachment mounts one cymbal to the bass drum so it can be crashed by another cymbal. The player operates the cymbal with one hand and the bass drum mallet with the other. The bass drum must be upright (see Figure 7.8), not flat on its side (see Figure 5.24b). Especially loud crashes are not possible with bass drum/cymbal attachment. (See Stravinsky's *Petrouchka*, Mahler's Symphonies 1 & 3, Rossini's Overtures.)



[Figure 7.8]

A cymbal can also be mounted face up on a cymbal stand to be used in the same manner.

A tam-tam can be struck with one crash cymbal. The inside face of the cymbal would strike flat against the face of the tam-tam. This produces the sound of both instruments.

## Gongs

*Gong* is a general term (like *tom-tom*) that refers to a group of instruments. It is not wise to use this term in writing without some additional qualification (e.g. *nipple gong* or *Chinese opera gong*). Although *tam-tam*, the most commonly used type of gong, is colloquially referred to simply as "gong," it should not be so in a score.

### Tam-tam

Like cymbals, tam-tams have a pitch spectrum - not a specific pitch. They are usually rather large but come in many sizes (10 to 50 inches). Ring time: a *fortissimo* tam-tam note would reach *piano* after about nine seconds, and a *piano* note would reach *pppp* after five seconds. Only one hand with one mallet is needed to roll on a large tam-tam because of its extended ring time. (See Mahler's and Shostakovich's Symphonies.)



[Figure 7.9]



Caxixi (pronounced *cah-SHEE-shee*) is a special type of shaker (see Figure 9.7). The caxixi has a harder surface at its bottom for a louder, brighter color. It can be shaken side-to-side, like a normal shaker, or top-to-bottom to make use of the different colors.

Various shakers or bells can be attached to a player’s ankles, wrists, or beaters to accompany the motion of stomping or playing of other instruments (see James Wood’s *Village Burial with Fire*, Sofia Gubaidulina’s *In the Beginning there was Rhythm*).

**Mark tree, wind chimes, bell tree**

Mark tree is a row of small metal chimes which are organized in pitch from high to low. A glissando up or down is produced by running a finger or beater through it. Mark trees continue swinging back and forth after they are struck and are usually left to exhaust themselves naturally (which takes about six seconds). Dampening mark trees requires a couple seconds to execute effectively; some mark trees have a muffle bar with which the performer can muffle more quickly. Glissando direction and duration (no longer than three seconds) should be indicated.



[Figure 9.8]

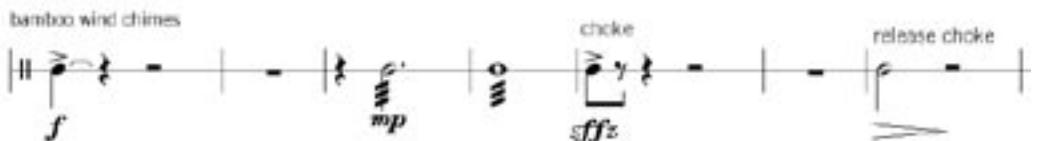
(See Per Nørgård’s *I Ching*, John Zorn’s *For Your Eyes Only*, Frank Zappa’s *Dogbreath Variations/Uncle Meat*.)



[Figure 9.9]

Wind chimes are very common (often found on one’s back porch). They are usually made of metal but also, when specified, of bamboo or glass. Wind chimes have a much shorter ring time than mark trees (about a second or two) so note length can be easily controlled. They can be sustained by noodling one’s fingers through them, they can be struck with a sharp attack and left to decay, or they can be clapped together and then held to stop the sound dead (often called a *wind chime choke*). After the chimes have been choked, the performer must eventually let go; this can be notated as a separate sound. If a silent release is desired, it must be done very slowly and carefully.

Notation for wind chimes is vague, usually a single hit with its natural decay or a trill or tremolo to indicate a sustained tone.



[Figure 9.10]

The composer should be careful not to write “chimes” if wind chimes are desired; “chimes” will indicate *tubular bells*.

Mark trees and wind chimes are sensitive and can be set into motion with just a light brush of a hand, body, or stick. For this reason, accidental mark tree/wind chime solos can occur during rehearsals and performances. In setups involving these instruments, care must be taken to avoid this. This is, of course, the performer's problem, but the composer should be aware of it.

Bell tree is a series of bells mounted on a stand and organized (inexactly) from high to low. It is similar to the mark tree but only sounds when struck (with a glock mallet, xylo mallet, or triangle beater) - there are no swinging parts. Glissandi, as well as random or relatively pitched single notes, can be played on a bell tree. Glissando direction and duration should be notated. If just a quick glissando is needed, be sure to indicate whether it should go to or start on the beat. (See Per Nørgård's *I Ching*, Steely Dan's *Babylon Sisters* and *Gaucha*.)



[Figure 9.11]

The bells of a bell tree are not exactly arranged in order of pitch - they are slightly mixed up. The microtonal scale stumbles upward and falls back down every couple of notes. In the context of a glissando, this mixed-up arrangement is not noticeable; it simply makes the glissando sound fuller.

### Pop gun

The pop of a pop gun is produced by forcing a cork out of a tube by pumping air into the other end. Once popped, the pop gun needs to be reloaded before it can be popped again; this takes only about a second. Operating a pop gun requires two hands, but it can be mounted and played with one hand if absolutely necessary. Only one dynamic, *forte*, should be requested.

### Quica (cuica)

Quica is a traditional Brazilian instrument. It is a small metal drum with a thin wood dowel attached to the inner side of the head. With a wet cloth, the wood dowel is rubbed (similar to the string of the lion's roar - see *Lion's Roar*) to create a moaning sound. The pitch can be altered by pressing on the head to different degrees. Specific pitches are not practical, but a few relative pitches can be executed. Specific note lengths up to a second long and rhythms no faster than sixteenth notes at  $\text{♩} = 100$  are possible. Some time must be allowed (about two or three seconds) for the percussionist to pick the quica up and get it into playing position. (See Rouse's *Infernal Machine*, John Zorn's *For Your Eyes Only*.)



[Figure 9.12]

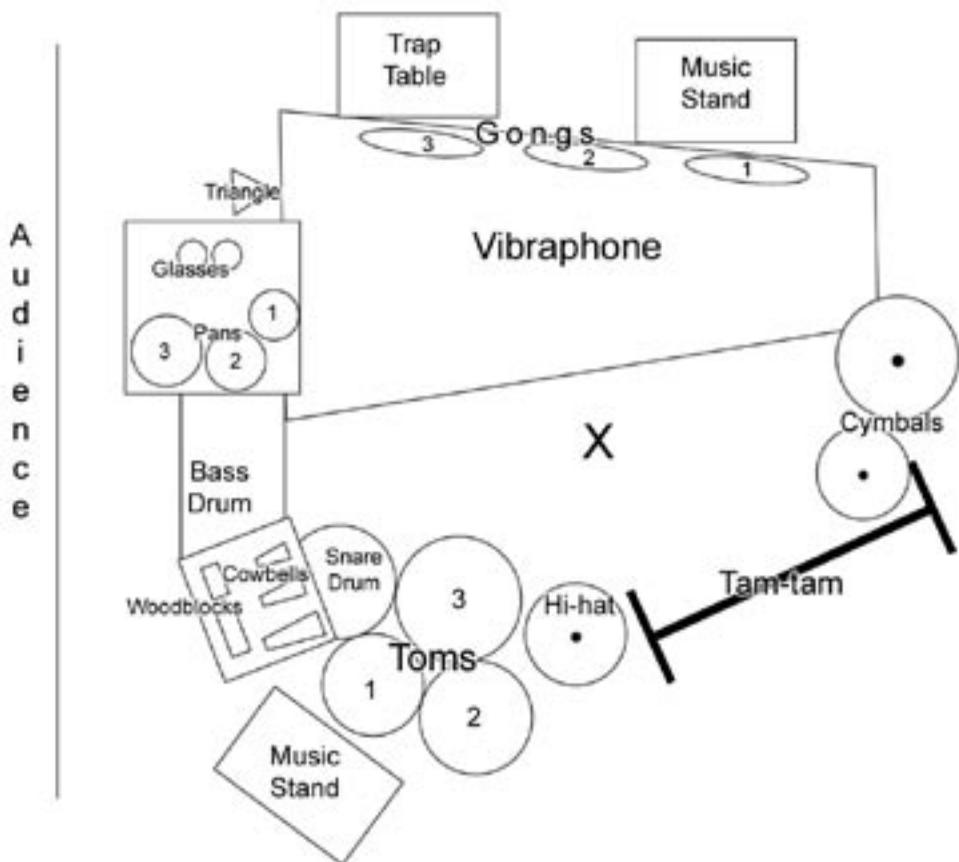
### Rainstick

Rainstick is a long tube filled with beads. When the tube is tipped, the beads fall and filter slowly down the body of the tube. This sounds like rain. Dynamics can be controlled with the speed of the falling beads which is dependent on the angle the tube is tipped. Very precise stopping and starting of the rain sound should not be expected. The rainstick can also be used as a giant shaker.



vibraphone  
 3 nipple gongs (no specific pitches)  
 2 crystal glasses  
 3 frying pans  
 3 cowbells  
 2 wood blocks  
 pedal bass drum  
 3 tom-toms  
 snare drum  
 hi-hat  
 2 suspended cymbals  
 large tam-tam  
 triangle

This is the setup for Shawn Crouch's *Suspended Contact*. In this case, the gongs hang from a rack over the vibraphone. The triangle hangs from a music stand. The vibraphone, bass drum, and hi-hat have pedals so footwork, as well as the direction the player is facing, must be considered. Pedals can be played with the heel of the foot so the player can play a pedal instrument even when facing the other way.



This setup surrounds the player entirely so there is no clean way to notate it. This is the notation used in *Suspended Contact* which Shawn and I designed before the piece was written. The gongs are notated without pitch.

The image shows a musical score for a percussion ensemble. It consists of three staves. The top staff is labeled 'vibraphone' and contains a treble clef and a series of notes. The middle staff is labeled 'glasses', 'pans', 'cymbals', 'triangle', 'wood blocks', and 'cowbells'. The bottom staff is labeled 'snare drum', 'gongs', 'toms', 'hi-hat', 'tam-tam', and 'bass drum'. The notation includes various symbols such as 'x' for cymbals, a triangle for the triangle, and 'open' and 'closed' for the hi-hat.

In hindsight, for reasons specific to the writing in the piece, the following notation may have been more appropriate; however, either notation is effective and functional.

The image shows an alternative musical score for a percussion ensemble. It consists of four staves. The top staff is labeled 'gongs' and 'cymbals'. The second staff is labeled 'vibraphone' and contains a treble clef. The third staff is labeled 'pans', 'glasses', and 'triangle'. The bottom staff is labeled 'bass drum', 'toms', 'snare drum', 'cowbells', 'wood blocks', 'hi hat', and 'tam tam'. The notation includes various symbols such as 'x' for cymbals, a triangle for the triangle, and 'x' for the hi-hat.

With large setups like this, it may be appropriate to alter the notation for different sections of the piece. For example, *Suspended Contact* features an extended passage for the suspended cymbals and hi-hat, during which those instruments could be consolidated onto one staff. As long as they are clearly labeled, these types of adjustments can and should be made.



Ryan Streber, *Rondel* for two percussionists

Mallet dampening would be used to achieve the articulations on the G#’s and F while letting the chord ring through.

The E and E<sub>b</sub> are executed with a left-handed independent roll.

This is a very accurate clef for the glockenspiel. Normally, glockenspiel is written in this register with a regular treble clef, and a two octave transposition is assumed. This notation, although unnecessary, leaves nothing in question.

“+” and “o” mean “node” and “center.” The dotted line indicates gradually moving from one position to the other. These notations are explained earlier in the part (not shown).

Here, Player 1 would switch from four vibraphone mallets to two vibe and two glockenspiel mallets - one of each, held in each hand.

When holding four mallets, it is difficult to get the knuckle in position to strike the edge of the tam-tam. Since there is so little time to get into position, especially at the next occurrence three bars later, Player 1 may decide to strike the edge of the tam-tam with the vibraphone mallet instead of his or her knuckle. This is a similar sound and is considerably easier to execute.

Even though the marimba is primarily played in its lowest octave, medium-hard mallets are required so these higher notes will speak well. This means that some of the rolls in the bass of the instrument will not sound as beautiful as they could with soft mallets.

Here, Player 2 would dampen gradually with his or her butt while rolling on the marimba.

The “tam-tam on edge” and “cymbals on dome” are both notated with diamond noteheads. This is appropriate because they are similar sul ponticello-like effects (see Tone Color).

The articulations on the single marimba notes are helpful, as it gives the performer the opportunity to use dampening or even dead strokes to differentiate between the staccato notes (like the B and E in this bar) and the l.v. notes (like the F# in the subsequent bar).

**Poco più mosso**

Here, Player 1 would switch to four vibe mallets.

**Poco più mosso**

In this entire excerpt, there is just enough time before and after each attack for Player 2 to pick up/put down a large gong beater and get to/from the marimba. This is important because these pitches require large gongs which would sound very differently if struck with the much smaller marimba mallets.