

3rd Finger in Low Positions: A “Hybrid” Fingering System for Improved Intonation and Increased Physical Ease

by **Scott Dixon**

In my observation, a great deal of physical tension and poor intonation result from playing diatonic half-steps between [1-2] in low positions. The narrow half-steps, “raised leading tones”, and wide Major 3rds of “Expressive Intonation” do not belong in bass lines; in ensemble playing we should tune harmonically, not “melodically”.

Using [1-3] instead of [1-2] for diatonic half-steps in low positions might interest you if:

- You do not have large hands
- You have a large bass
- You have hand/arm pain or tension in low positions
- You struggle with intonation in low positions
- You struggle with Major 3rd double stops in low positions
- You teach somebody for whom any of the above apply.

(Measurements of a typical “large” hand and a typical “small” hand are in approximately a 4:3 ratio. Let’s say you have “large” hands and you play a standard 41.5-inch string length; for you to know what it *feels* like to play on your bass with “small” hands, you’d need to play a bass with a 55-INCH STRING LENGTH!)

Notes & Definitions:

For most of this article assume Equal Tempered intervals for the sake of simplicity: evenly spaced half-steps and enharmonic equivalents (e.g. A# = Bb, D# = Eb). I’ll discuss applications for Just Intonation briefly toward the end of the article.

- Numbers in brackets refer to fingerings. For example, [1] = 1st finger, [1-4] = 1st finger to 4th finger.
 - “Frets” in the photos are marked with tape to help clarify spacing.
- Neutral finger spacing: the way your fingers curve naturally, with minimal muscular effort
- Abduction: fingers actively spread apart
- Adduction: fingers actively pulled together
- Flexion: fingers pulled into a curl

- Extension: fingers pointed straight
- Diatonic half-step: different-letter (e.g. D-Eb, G-Ab) In Just-Intonation these are “wide” half-steps
- Chromatic half-step: same-letter (e.g. D-D#, G-G#) In Just-Intonation these are “narrow” half-steps

Here, intervals also imply their cross-string derivatives. A diatonic half-step finger spacing played across strings could be, for example, a Major 3rd, Major 6th, diminished 5th. A whole-step spacing played across strings could be, for example, a Perfect 5th, octave, minor 3rd, minor 6th.

For clarity and simplicity, a “position” will be a whole-step spacing between [1-4], with no pivot, shift, finger extension, or thumb.

Background

Most people can comfortably play a whole-step in low positions with [1-4]. People with smaller hands might need some degree of finger abduction; people with larger hands might need some degree of finger adduction. Nevertheless, a [1-4] whole-step is a natural, comfortable spacing for most people on most basses.

So far, so good. But now we must divide 4 into 3: with [1] and [4] playing a whole-step on one string, we have one note in the middle, but two fingers to choose from. 4 evenly spaced fingers, 3 evenly spaced notes.

Generally, there are two ways of dealing with this:

- What I’ll call the “Traditional” system that most of us are familiar with, which uses [1-2-4]. It puts the abducted finger spacing between [1-2], and the neutral finger spacing between [2-4].
- The “Italian” system, which uses [1-3-4]. It puts the neutral finger spacing between [1-3], and the abducted finger spacing between the [3-4]:

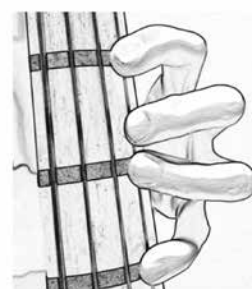
"Traditional" fingering system:

"Abducted" finger spacing between [1-2],
"Neutral" finger spacing between [2-4]



"Italian" fingering system

"Neutral" finger spacing between [1-3],
"Abducted" finger spacing between [3-4]



Both the Traditional and Italian systems result in chromatic hand-shapes, fixing the 4 fingers into an evenly spaced 3 semi-tone shape. These fingering systems are designed to play *two adjacent linear half-steps* on each string without shifting or pivoting; the fingers are poised ready to play all the chromatics in any given position.

Yes, Francois Rabbath's *Nouvelle Technique*, which I use and teach, organizes the fingerboard diatonically, by fluidly connecting positions via pivots. An important distinction, though, is that a pivot is a *motion* not a *fingering*. The *Nouvelle Technique* still uses the "suspect" [1-2-4] fingering system in low positions.

In one position (with no pivot, shift, or finger extension) these systems yield a pitch collection like this:

Traditional fingerings: 1 2 4 1 2 4 1 2 4 1 2 4 Pitch collection "normalized" into a scale:

Italian fingerings: 1 3 4 1 3 4 1 3 4 1 3 4

IV----- III----- II----- I-----

The image shows a musical staff with two systems of fingerings. The top system is for the Traditional fingering system, with fingerings 1, 2, 4, 1, 2, 4, 1, 2, 4, 1, 2, 4. The bottom system is for the Italian fingering system, with fingerings 1, 3, 4, 1, 3, 4, 1, 3, 4, 1, 3, 4. To the right of the fingerings is a musical staff showing the pitch collection "normalized" into a scale, which is a chromatic scale. Below the Italian fingerings are four groups of fingerings: IV-----, III-----, II-----, and I-----.

This pitch collection makes sense in Bebop or 12-tone music, but in most contexts it is cluttered and non-tonal. It's fair to say that *most* of the music that *most* people play *most* of the time is *mostly* diatonic. Relatively, how often do we play *two adjacent linear half-steps* on one string, compared to the amount of time we play *all other possible interval combinations*? With the exceptions of Jazz and 12-tone music, most chromaticism results from:

1. Modulation/tonicization (one *diatonic* set followed by a different *diatonic* set, where most of the notes remain unchanged from old key to new key)
2. Chromatic inflection (chromatic neighbor-tone excursion, mode mixture, etc.)
3. Connecting two chord tones by "filling in" the space with chromatics

Only the third type implies two or more adjacent linear half-steps.

Consider the following list of standard orchestral excerpts — there's something that they all have in common:

Mozart 39, Mvt. IV, Development; Haydn 88, Mvt. IV, Development (bars 108-141); Beethoven 9 Recits; Bruckner, Symphony 7, Mvt. I, Letters E-G, Mvt. IV, Letters P-4 after letter R; Strauss, *Ein Heldenleben*, Battle Scene; Verdi, *Otello*, soli; Mendelssohn "Italian" Symphony, Mvt. I, bar 41-Letter A; Brahms 1, Mvt. I, Letter E; Beethoven 5, Mvt. II, Letter C, Scherzo and Trio; Mussorgsky, *Pictures at an Exhibition*

With all the chromaticism, modulation and tonicization in these passages, there is not a single instance of *adjacent linear half-steps* in this entire list of excerpts! The interval combination that most fingering systems prioritize doesn't occur in this entire list.

Don Juan by Strauss is an obvious exception; it has adjacent linear half-steps built into the primary thematic material. Even still, the bass part has relatively few instances of consecutive linear half-steps, compared to all other consecutive interval combinations played.

The Traditional fingering system forces an abducted spacing between [1-2] in order to be available for chromatics even when they're not sounding. Does it really make sense to use an asymmetrical semi-tone chromatic fingering system, alternating between neutral spacing and abducted spacing, when most music is fundamentally diatonic? Even music with many accidentals is usually made up of overlapping diatonic sets.

If we run these fingering systems through a “diatonic filter”, we get something like this (diatonic to F Major, for example):

"Traditional" fingering system:

Neutral finger spacing

0 2 4 0 2 4 2 0 4 2 0

Abducted finger spacing

0 1 2 0 1 2 1 0 2 1 0

"Italian" fingering system:

Abducted finger spacing

0 3 4 0 3 4 3 0 4 3 0

Neutral finger spacing

0 1 3 0 1 3 1 0 3 1 0

Both systems have a neutral finger spacing and an abducted finger spacing. Why not take the neutral finger spacing of *both* systems, and avoid the abducted finger spacing of both systems?

Here is the same passage, using the neutral finger spacing taken from both the Traditional and Italian systems:

"Hybrid" fingering system:

Neutral finger spacing from Traditional system:

0 2 4 0 2 4 2 0 4 2 0

Neutral finger spacing from Italian system:

0 1 3 0 1 3 1 0 3 1 0

Examples

Trills: Low Position trills are a good “gateway” into low-position 3rd finger. Most people find that the [1-3] half-step trill is easier and better in tune than the traditional options.

1/2

tr

2/4

tr

1/3

tr

Consistency of spacing: Play the fingerings below. It might take some time to become accustomed to using [3] in this way, but you’ll likely find that [1-3] matches the intonation of the [2-4] better than [1-2]. Also, [1-2] might require a different arm orientation, and the abducted finger spacing fatigues more quickly than a neutral finger spacing.

Neutral Abducted

2 4 2 4 2 1 2 1 2 1

I -----

Neutral Neutral

2 4 2 4 2 1 3 1 3 1

I -----

Without going into the complex mathematical “proofs”, the half-step A-Bb below is the same *physical distance* as the whole step F-G. Most fingering systems prescribe playing F-G with [1-3], yet prescribe A-Bb to be played [1-2].

In this example, the *physical distance* between A-Bb is the same as between F-G.
Most people would not choose to play F-G with [1-2].

Abducted

1 2 1 2 1 1 2 1 2 1

I -----

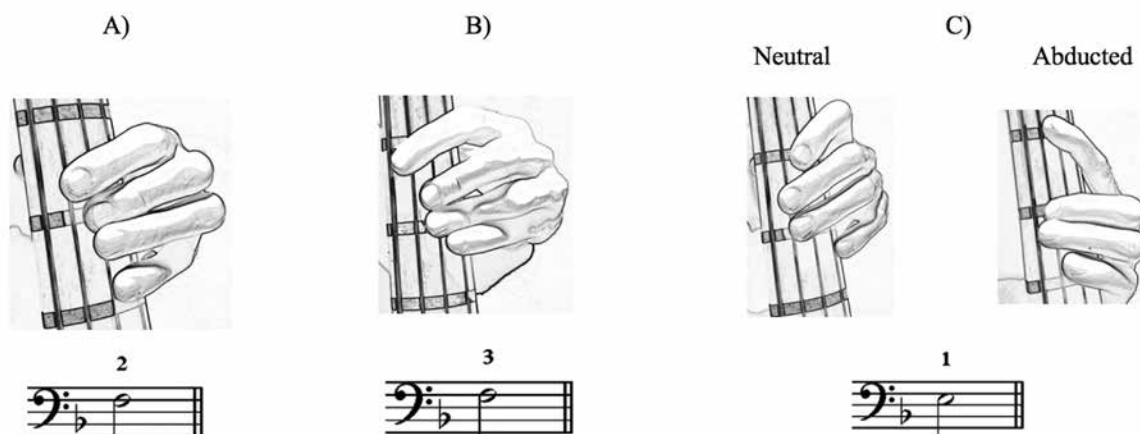
Neutral

1 3 1 3 1 1 3 1 3 1

I -----

Availability of non-playing fingers: For each printed note, find a relaxed, comfortable hand-shape; vibrate to be sure you’re not holding tension.

In Example A, which notes are most available to the non-playing fingers? F# and B natural, neither of which is in the key of F. In this position, this hand-shape makes sense for Gb Major, but not for F Major.



In example B, diatonic pitches E and A are readily available to the non-playing [1].

In example C, which finger naturally falls closest to diatonic pitches G, C, F and Bb? [3] already is comfortably there, but [2] has to “stretch” to get there.

Fast passages: Play the passage below using the three different fingerings.

The half-step between [2-4] is a neutral spacing, but the 4th finger fatigues more quickly than the others:



The half-step between [1-2] is usually too narrow. Spreading the fingers to widen the interval causes tension:

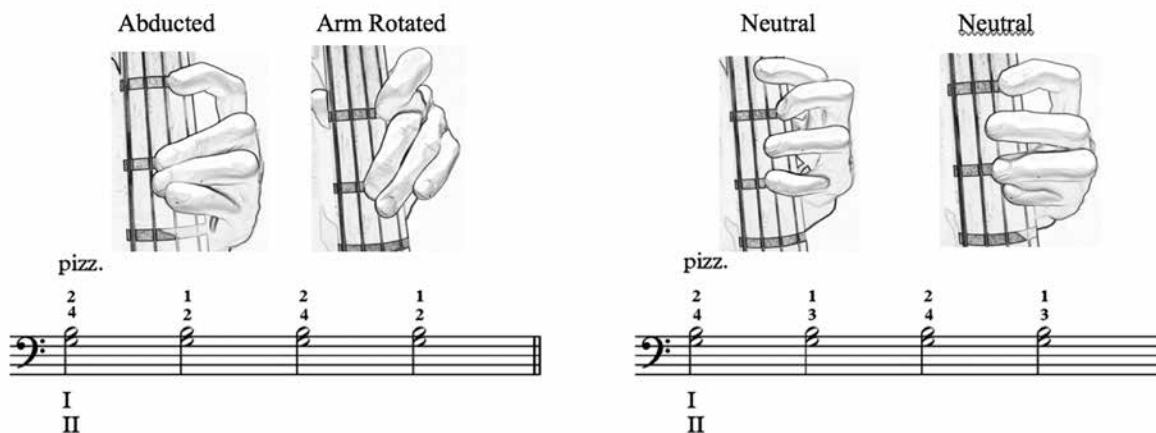


The half-step between [1-3] is stronger, more flexible, and better in tune than the traditional options:



Major 3rd Double-stops: Play the following fingerings. Many people find that the second set allows for more consistent intonation and more consistent arm/hand position from double-stop to double-stop.

The [1-2] Major 3rd requires a different arm position and different hand-shape from the [2-4] Major 3rd. Also, [2] is “occupied” during the first double-stop, and must “hop” from one string to another to get to the second double-stop

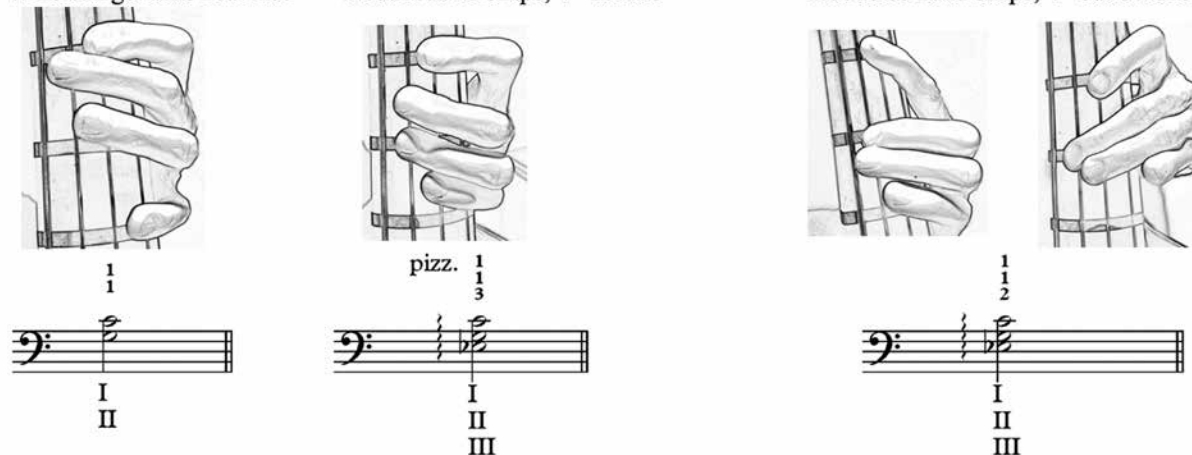


Chords: Play the barred 4th with [1]. Notice which finger naturally falls closest to the Eb on the A string. Playing the Eb with [2], as prescribed by most methods, pulls the bar out of “square” with the strings, and is out of tune.

Which finger falls near Eb?

Neutral hand shape, 4th in tune

Abducted hand shape, 4th out of tune



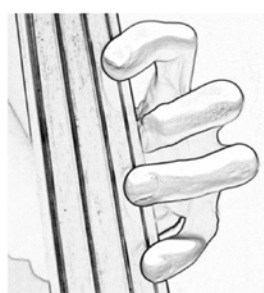
Applications for Just-Intonation: We don’t actually need to divide 4 into 3. In Just intonation there are two discrete notes within a whole-step. Between A and B, for example, are *both* A# and Bb. They are *not* enharmonic equivalents; A# ≠ Bb. Chromatic half-steps are narrower than diatonic half-steps.

Just-Intonation theory is far beyond the scope of this article. The simplest way I can think to put it is this: Just-Intonation is about matching shared overtones between two or more notes.

Sharps are low, flats are high, Major 3rds are “narrow”, minor 3rds are “wide”. Diatonic half-steps are “wide”, chromatic half-steps are “narrow”, etc. Yes, this is the opposite of what violin soloists call, “Expressive Intonation” (see the first paragraph).

Pure Just-Intonation is impractical in most large ensemble settings. Aim for what I call “Resonant Intonation”; this falls somewhere between Just and Equal-Tempered intervals; play the *version* of the note that is *most* in tune given the context. In a bass section, it’s always better to match those around you than to be “right” but not matching.

Try the following example. You’ll need two friends to play the other lines; be sure your open strings are precisely in tune with each other.



If you’re really matching overtones well, the Bb will be closer to B than to A, not right in the middle.



If you’re really matching overtones well, the A# will be closer to A than to B, not right in the middle.



But, isn't 3rd finger "weak"?

Try this: On a tabletop, firmly tap each of the four fingertips or finger-pads as if playing a piano. Try to make the sound of each fingertip the same. Now, alternate one finger, then the other, in all the possible pair combinations: [1-2], [1-3], [1-4], [2-3], [2-4], [3-4].

Repeat the above with the fingers (a) Abducted (spread wide apart) (b) Extended straight out; then (c) With your palm lying flat on the table. What do you notice? How does each combination feel and sound?

You'll find that 3rd finger is "weak" when:

- Used in *opposition* to adjacent fingers (due to the arrangement of shared tendons)
- Abducted
- Extended (when the finger is straightened)
- Used in flexion in the finger muscles (located in the forearm)

And [3] finger is "strong" when:

- Dropped with the *grasping* muscles (located in the palm of the hand), starting from a neutral, arched hand-shape. This is the way the hand should look while playing.

"Hybrid" Fingering System for Diatonic and Chromatic Passages

The easiest way to start incorporating [3] in low positions is simply to be aware that it's there. The old rule from Simandl (that you don't use [3] until thumb position) is so ingrained that we'd sooner give ourselves tendonitis and play out of tune than consider [3] as an option. If a fingering causes strain in your left hand, chances are that's a good time to consider [3].

Whole Steps: [1-4]

- The two "outside" fingers, [1] and [4], are used as normal in the Traditional systems.

Diatonic Half-steps (different-letter name): [1-3] or [2-4]

- The two "inside" fingers, [2]/[3], are *interchangeable* depending upon intervallic context; use whichever finger allows a neutral hand-shape and neutral arm position:

A diatonic half-step *above* [1] is played [3]

A diatonic half-step *below* [4] is played [2]

Chromatic half-steps (same-letter name): [1-2] (more often) or, [3-4] (less often)

- The "narrow" chromatic half-steps reflect the closer natural spacing between [1-2] and [3-4] These fingerings help "modulate"; they connect one diatonic set to another. They occur far less frequently than diatonic half-steps.
- In very fast chromatic playing, simply use [1-2-4] as you always have.

In most keys in most circumstances: [2] generally plays naturals or sharps; [3] generally plays naturals or flats.

The "tuning harmonics" position illustrates the diatonic fingerings well, because all notes played with [1] and [4] are naturals, all notes played with [2] are sharps, and all notes played with [3] are flats.

You can extrapolate this chart to the other positions. You'll find that each position tends to "prefer" one hand-shape over the other, given the most common keys.

The "tuning harmonics" position provides a clear illustration because all notes played with [1] and [4] are naturals, all notes played with [2] are sharps, and all notes played with [3] are flats. The middle of the page represents the "top" of the circle of 5ths; start there with the neutral hand-shape and go all the way Clockwise (sharpwise), then go back to the middle and go all the way Counter-clockwise (flatwise).

The arrangement of notes on the fingerboard in any given position moves in mirror image from the starting point:

Clockwise Orientation: Favors [2-4]



Clockwise around the circle of 5ths:

- [1] "Modulates" to [2]
- The hand rotates from Neutral orientation to Clockwise orientation.

Neutral Orientation: Favors [1-4]



Counter-Clockwise around the circle of 5ths:

- [4] "Modulates" to [3]
- The hand rotates from Neutral orientation to Counter-Clockwise orientation.

Counter-Clockwise Orientation: Favors [1-3]



Two Keys Use Only [2-4]

Three Keys Use [1-4] and [2-4]

Two Keys Use Only [1-4]

Three Keys Use [1-4] and [1-3]

Two Keys Use Only [1-3]

F# 
IV

B 
IV

E 
IV

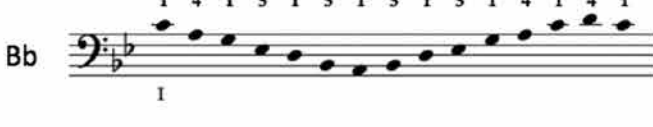
A 
IV

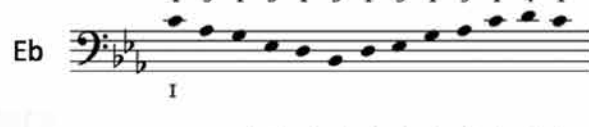
D 
IV

G 
IV

C 
I

F 
I

Bb 
I

Eb 
I

Ab 
I

Db 
I

Volume 41, Number 2

19

Closing

I first learned of using [1-3] for diatonic half-steps in low positions while I was a fellow at the New World Symphony. I was having a lesson with Harold Robinson, who demonstrated the following passage from Beethoven 5, II, with this fingering:

I asked, "Did you just play half-steps with 1 and 3!?"

Hal smiled and said, "Yes, but don't tell anybody" ...

I've asked his permission to share this, and he agreed, adding, "I use [3] in low positions when I don't have to employ [4]. And for chromatics I still use [1-2-4]. This comes from my desire to "weight" the strings down by hanging from the fingerboard, rather than pressing the strings between fingers and thumb. I have never been a proponent of the "perfect" spread hand-shape. My goal is to keep my hand weighted and comfy as possible" (paraphrasing).



There are *many* very well-known bass players who use this idea to some degree. I've found it enormously helpful, and I think it is time to get it out in the open. I certainly don't "require" my students to use my Hybrid fingering system. I simply suggest [3] as an option when it will solve a problem. It usually substantially improves low position sound, ease, and intonation.

You'll want to decide for yourself how far up the fingerboard to take this idea. If you have larger hands you may use it in only the lowest positions; if you have smaller hands you might want to use this system all the way up to thumb position.

Let your body inform your brain, not the other way around.

Scott Dixon joined the Cleveland Orchestra bass section in 2007. He is the String Division Chair and Double Bass Department Head at the Cleveland Institute of Music and is on teaching faculty at Domaine Forget. 



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