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On terminology for diatonic, chromatic, and enharmonic keyboards

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When dealing with keyboards with more than twelve keys per octave often the designations «chromatic» or «enharmonic» keyboard or related terms (such as *cimbalo cromatico*) are used, both historically and in present-day publications. Rarely, if ever, is it made clear, however, which criteria are used to decide whether a keyboard is chromatic or enharmonic, or perhaps even both. In this paper it will be attempted, for the sake of clarity in discussions on this subject, to formulate well-reasoned criteria as how to answer the question of under which circumstances a keyboard may be called diatonic, chromatic or enharmonic.

The definition proposed in the *New Grove Dictionary of Music and Musicians*, calling every keyboard «enharmonic» with more than twelve sounding pitches per octave, seems too simple,[1] especially since, for example, it contradicts historical situations in which keyboards having between 12 and 19 notes per octave are termed *cimbalo cromatico* or something like it. Instead, it seems better to try to retain the familiar triad diatonic-chromatic-enharmonic, a triad introduced two and a half millenia ago in Greek music theory in order to distinguish between the three ways of forming a tetrachord and thus to define tonal systems with various intervals (the diatonic, chromatic, and enharmonic genres), which are still used as key concepts in present-day music theory, albeit with meanings and connotations differing from the original Greek ones. Between the Greek antiquity and today the three terms have been used in a variety of ways that is too large to summarise here. This variety, however, allows us to use the terms with a certain liberty and to mould them according to our wishes and necessities.

1 Nicolas Meeùs, «Enharmonic keyboard», in: *New Grove Dictionary of Music and Musicians, Second Edition* 8 (2001), pp. 248–250.

Keyboards with up to twelve notes per octave

Let us first have a look at the ordinary, twelve-note keyboard, consisting of seven lower keys, representing the diatonic degrees of the scale of C major, and five upper keys, representing their chromatic inflections. The diatonic degrees may be ordered according to their relation in the row of fifths in the following way:

F - C - G - D - A - E - B

In such an order D takes the central place. One could see the seven degrees as the outcome of a process starting with D and progressing by adding notes at a fifth's distance alternately at the right and left sides, first A, than G, etc. until F as the last added note. One could construct a keyboard with just these seven diatonic degrees. There seems no other possibility than to call such a keyboard a *diatonic keyboard*.

Despite its simplicity there is already some variety in a diatonic keyboard. The steps between C-D, D-E, F-G, and G-A are called diatonic whole tones; the steps B-C and E-F are diatonic semitones. If the notes are placed in a simple ascending order with D as the centre, then the arrangement is again symmetrical:

A B C D E F G

So far the basic design of the diatonic keyboard, with its five diatonic whole-tone steps and two semitone steps.

What happens if the keyboard is further extended by adding notes with the interval of a fifth from the outer notes in the first row (F-B) as given above? The first note added is F♯, the second B♭, the third C♯, the fourth E♭, and the fifth G♯. Already the addition of the first note, F♯, introduces a novel element in the layout of the keyboard: from F to F♯ a new kind of interval is formed, the *chromatic semitone*. In fact, it is formed as a complement to the diatonic semitone (F♯-G) within the compass of a diatonic whole tone (F-G). Two semitone steps, namely a diatonic semitone step and a chromatic semitone step, replace a single whole-tone step. The addition of the other notes (B♭, C♯, E♭, G♯) has similar consequences: with each addition a whole tone is divided into a diatonic and a chromatic semitone. The diatonic keyboard had five whole-tone steps so that after the addition of five extra notes all five whole-tone steps have been transformed into a diatonic-chromatic semitone pair. The total number of notes is now twelve and the keyboard that has emerged now is of course the common twelve-note keyboard. The twelve notes can be ordered in a line of fifths:

E♭ - B♭ - F - C - G - D - A - E - B - F♯ - C♯ - G♯

or in an ascending order of pitch, usually called a chromatic order, which may begin with C:

C - C♯ - D - E♭ - E - F - F♯ - G - G♯ - A - B♭ - B - C.

The expansion of the keyboard from seven to twelve keys has on the one side removed all diatonic whole tone steps and on the other side introduced chromatic semitones. If the steps of the ascending scale are considered, the diatonic semitones comprise a majority of seven. A minority of five chromatic semitones complements them. When considering nomenclature, there are reasons to use the term diatonic as well as chromatic for a 12-note keyboard. A decision on which term should be preferred will be postponed until later in this contribution, after extensions of the keyboard beyond the twelve-note design have been considered.

From 12 to 19 notes per octave

What happens if notes are added to the keyboard in addition to the twelve-note design? The note that completed the twelve-note keyboard was G♯, so the next note should be added at the ‹left› side of the line of fifths, that is, A♭. The positioning of this note brings a number of problems not yet encountered before. To begin with, it should be remarked that its pitch (A♭) is very near the previously last added note (G♯), whatever method is chosen to tune the keyboard. The question is now whether the added A♭ is lower in pitch than the already present G♯ or higher. (Having A♭ and G♯ with equal pitches seems to be excluded because it does not make sense to add a key with a pitch that is already available.) The outcome of the comparison of the pitches of G♯ and A♭ depends in fact on the size of the fifths that has been chosen for the tuning of the keyboard. For the sake of simplicity, it will be assumed that all fifths in the keyboard are of equal size, whether or not they conform to the theoretical size of the frequency ratio 2:3 or 701.955 cents. With such equal fifths, it transpires that the added A♭ has a higher pitch («is higher») than G♯ if (and only if) the size of the fifths is smaller than the size of the fifths in equal temperament, which is as ratio 1: $2^{7/12}$ or, logarithmically, 700 cents. If the size of the fifths is larger than the equal-temperament size, the pitch of the newly added A♭ will be lower than G♯. That means, for example, that the latter relation will hold when the fifths are just.

For the theory of the keyboard the pitch relation between G♯ and A♭ is of principal importance. Let us first consider the case when the fifth of the tuning is larger than the fifth of equal temperament. In that case A♭ falls between G and G♯ and splits this interval into G-A♭ and A♭-G♯. The first interval (G-A♭) is a diatonic semitone, but what should we call the second? If we leave the semitone and whole-tone designations for a moment and adopt the terminology used for the larger intervals, the interval A♭-G♯ is nothing but a *downward diminished* second. Since with a fifth larger than equal-tempered the diminished second is an interval of «negative» size (meaning the A♭ is lower than G♯), a nominally downward diminished second causes the pitch to rise. It is tempting to call this interval an enharmonic semitone, as a continuation of the terminology with diatonic and chromatic semitone, but we will not do so, because the interval is not a semitone. Instead, it could be called the *enharmonic interval*, since it represents the interval between notes that are enharmonically equivalent in 12-note equal temperament.

The addition of further notes beyond the A♭, that is, D♯, D♭, A♯, and G♭, causes the other chromatic semitones of the twelve-note keyboard to be split one by one into a pair of a diatonic semitone and a downward diminished second. Since the twelve-note keyboard contains five chromatic semitones, the process of splitting them is completed with the addition of the fifth extra note. The total number of notes has now increased to seventeen. If the notes are ordered in an ascending sequence, the result is:

C - D♭ - C♯ - D - E♭ - D♯ - E - F - G♭ - F♯ - G - A♭ - G♯ - A - B♭ - A♯ - B - C

Keyboards may be constructed and tuned along these lines, but they are not very practical. In fact, this construction seems illogical, since it adds diatonic intervals at the cost of chromatic intervals. If further notes are added above the seventeenth, even more complicated situations arise. The next added note, for example, which is E♯, splits the diatonic semitone F-G♭ into F-E♯ (a downward diminished second, causing a higher pitch) and E♯-G♭ (a doubly-diminished third). Since there are twelve diatonic semitones in the 17-notes keyboard with fifths larger than in equal temperament, the process repeats itself twelve times, until a 29-note keyboard is reached. Historical examples of chromatic and enharmonic keyboards have not adhered to this construction principle, so that we will not pursue keyboards based on tunings with fifths larger than the equal-tempered fifths.

To keep the discussion simple and understandable, it is better to assume that the fifths are smaller than those in equal temperament, such as the ones in meantone temperament and in the various 1/5- and 1/6-comma temperaments.[2] In this case the added A♭ splits the diatonic semitone G♯-A into two parts, the intervals G♯-A♭ and A♭-A. The second interval is a chromatic semitone, the first a diminished second, which we have met and described above. Only here it is a «positive» interval in the sense that the second note, derived from the higher natural, has a higher pitch. Summarising, the addition of an extra note to a twelve-note keyboard splits one of the diatonic semitones into a chromatic semitone (which could also be called an augmented unison) plus a diminished second.

The addition of further notes beyond the A♭, that is, D♯, D♭, A♯, G♭, E♯, and C♭, causes the diatonic semitones of the twelve-note keyboard to be split one by one into a pair consisting of a chromatic semitone and a diminished second. Since the twelve-note keyboard contained seven diatonic semitones, the process of splitting them is completed with the addition of the seventh extra note, by which the total number of notes has increased to nineteen. With eighteen notes in the octave, there is still one diatonic semitone (namely, B-C), with nineteen notes there are only chromatic semitones (twelve of them) and diminished seconds (seven).

From 19 to 31 notes per octave

What happens when the process of adding notes with the interval of a fifth is continued after having added the nineteenth note? After all, there is no diatonic semitone left over that can be split into two parts. Let us first consider the 19-note keyboard with the notes in ascending pitch order:

C - C♯ - D♭ - D - D♯ - E♭ - E - E♯ - F - F♯ - G♭ - G - G♯ - A♭ - A - A♯ - B♭ - B - C♭ - C

The process of adding notes to this keyboard can be viewed by analogy with the addition of notes to the 12-note keyboard: the addition of each note splits a particular interval into two parts. And just as the addition of notes to the 12-note keyboard splits diatonic semitones into chromatic semitones and diminished seconds (the latter interval not being present in a 12-note keyboard), the addition of notes to a 19-note keyboard splits the chromatic semitones into two parts, namely the diminished second (already present in the keyboard) and another one not yet present. To see how this new interval should be called, one may consider the first added note, the B♯.

2 I say «various temperaments» because the tempering of the fifth can be expressed in fractions of both the ditonic comma (of 24.5 cents) and the syntonic comma (of 22.5 cents).

It can be shown that in the case of equal fifths which have a size in between the equal-tempered size (tempered nearly 2 cents) and the size of the fifth if tempered with a third of a syntonic comma (about 7 cents), B♯ is higher than C♭ but lower than C. In other words, B♯ will split the chromatic semitone C♭-C into two parts. These two parts are C♭-B♯ and B♯-C, respectively. In the latter interval we recognize the diminished second (as between G♯ and A♭); the former interval (C♭-B♯) is a downward interval (since the diatonic degree of B is below that of C) of negative size (since B♯ is higher than C♭). Since B-C is a minor second, B♯-C may be called a diminished second, B♯-C♭ a doubly diminished second, and therefore C♭-B♯ a *downward doubly-diminished second*. This nomenclature may look disturbingly complex, but is in fact completely logical and consistent with standard interval terminology.[3]

A 19-note keyboard has 12 chromatic semitones. That means that a chromatic semitone can be split twelve times into a pair of an upward singly diminished second and a downward doubly-diminished second. This process is started with the addition of B♯, which splits the chromatic semitone C♭-C, and is continued with the addition of F♭, F♯♯, B♭♭, C♯♯, E♭♭, G♯♯, A♭♭, D♯♯, D♭♭, and A♯♯, and is completed with the addition of G♭♭. With the addition of the latter note the last chromatic semitone (the one between F and F♯) has been split into two smaller intervals. The keyboard has now 31 notes or keys per octave. The full series of 31 notes per octave looks as follows:

C - D♭♭ - C♯ - D♭ - C♯♯ - D - E♭♭ - D♯ - E♭ - D♯♯ - E - F♭ - E♯ - F - G♭♭ - F♯ - G♭ - F♯♯- G - A♭♭ - G♯ - A♭ - G♯♯ - A - B♭♭ - A♯ - B♭ - A♯♯ - B - C♭ - B♯ - C

The reader will believe me when I say that the process can be continued after the 31-note keyboard, and that the addition of the 32nd note will split the diminished second into two parts (because there are no chromatic semitones left over to be split). Since there are nineteen diminished seconds in a 31-note keyboard, the process of splitting them into two smaller intervals may be continued until a keyboard with fifty notes per octave is reached. After that, it is the turn for the «downward doubly-diminished seconds» to be split, of which there are 31 in a 50-note keyboard. Comple-

3 The consistency appears for example from the addition of the (upward) diminished second and the downward doubly-diminished second to a chromatic semitone (or augmented unison). The addition of an upward and a downward form of the same interval as far as diatonic degrees are concerned, results in some kind of unison. «Doubly diminished downward» corresponds to «doubly augmented upward», so that «doubly diminished downward» plus «singly diminished upward» add up to «singly augmented upward», which describes the quality of a chromatic semitone.

tion of this process will lead to an 81-note keyboard. The reader will forgive me for not pursuing in detail this line of consideration further than the 31-note keyboard.

Keyboards with seven to 31 notes per octave

We have started our overview of the interval composition of keyboards with a seven-note keyboard, with only diatonic semitones and diatonic whole tones. For the sake of theoretical description it may be useful to look at how keyboards would be constructed with even fewer than seven notes per octave. A theoretical keyboard with one note per octave (only Ds), would have only octaves between neighbouring notes, one with two notes (D and A) one fifth and one fourth within a single octave. Similarly, a three-note keyboard (D, G, A) would have two fourth and one major second (or diatonic whole tone), a four-note keyboard (D, E, G, A) one fourth, one minor third and two major seconds, a five-note keyboard (C, D, E, G, A) two minor thirds and three major seconds, a six-note keyboard (C, D, E, G, A, B) one minor third, four major seconds, and one minor second (or diatonic semitone).

The examples of keyboards with fewer than seven notes per octave make clear that the seven-note keyboard is the smallest or simplest one having only steps of major and minor seconds. This makes the seven-note keyboard our lower limit of interest. Above we have set the 31-note keyboard as the upper limit of our interest, so that from now on our discussion will cover the range of keyboards with 7 to 31 notes per octave. Table I, which is appended to this article, lists the interval composition of these keyboards, that is, the numbers of the various types of step intervals which occur in them. By «step interval» is meant the interval between a key and its next higher (or lower) key.

Each keyboard described so far corresponds to a collection of notes or pitches. Keyboards with notes that can be ordered in unbroken lines of fifths may be called *rational keyboards* because of their rational design: since Western music by and large is tonal and employs keys at distances of a fifth among them, a closed row of fifths seems to be a rational starting point for whatever keyboard. Keyboards may be called *symmetrical keyboards* if the note D has the central position in the row of fifths. In all examples we have presupposed a rational and symmetric keyboard design.

Table I makes clear some especially intriguing properties of keyboards. First, for keyboards of any number of notes (per octave) there are two or three different step intervals between neighbouring notes. Most often there are three different intervals, only a few special ones have simply two types of intervals: the seven-note keyboard with only diatonic whole tones and semitones, the twelve-note keyboard with the diatonic and chromatic semitones, the nineteen-note keyboard with chromatic semitones and diminished seconds, and the 31-note keyboard with diminished seconds and «downward doubly-diminished seconds».

If one looks at the occurrence of specific step intervals in keyboards of a varying number of notes, it is seen that certain intervals have a maximum number of appearances in a keyboard with a specific number of notes. They then have one appearance less with every note added to or removed from the keyboard. So the diatonic whole tone reaches its maximum number of appearances in the keyboard with seven notes, the diatonic semitone in one with twelve notes, the chromatic semitone in one with nineteen notes, and the diminished second in one with thirty-one notes. These keyboards are just the ones with only two types of step intervals. The maximum numbers of the various step intervals are five (diatonic whole tones in a 7-note keyboard), seven (diatonic semitones in a 12-note keyboard), twelve (chromatic semitones in a 19-note keyboard), and nineteen (diminished seconds in a 31-note keyboard).

The above observations single out the keyboards with 12, 19, or 31 notes per octave as cases of special interest. It may not come as a surprise that in historical and the present discussion of keyboard design these keyboards have received by far the most attention, much more than, say, keyboards with 13, 14, 18, 20, or 30 notes per octave. They are special also in having the property that they can be easily tuned in equal temperament and especially in such an equal temperament that operates with a single circle of fifths with quite acceptable tempering. If a 12-note keyboard is tuned with equal fifths, familiar 12-note equal temperament is the result, with a fifth tempered by 1/12 of a ditonic comma (or 1.955 cents). A circular equal temperament with 19 notes has fifths tempered by 7.218 cents, which comes very close to one third of a syntonic comma (7.169 cents). A circular equal temperament with 31 notes has fifths tempered by 5.181 cents, a value very close to that of quarter-comma meantone temperament (5.377 cents). (The correspondences have been noted ever since the seventeenth century.) These observations give rise to some interesting additional statements: for keyboards with more than 12 notes ordinary 12-note equal temperament is useless, because all additional keys will have pitches that are equal to those already present in the 12-note keyboard. For keyboards with more than 19 notes per octave, tuning with fifths that are tempered by 1/3 of a comma is useless for the same reason: no new pitches will be created this way. And for keyboards with more than 31 notes per octave meantone tuning is useless.

If one tries to construct circular equal temperaments with other numbers of notes per octave than 12, 19, or 31, the result will consist either of multiple circles of fifths or of single circles with large temperings (often positive, that is, enlarging the fifth), or both.[4] The keyboards other than those with 12, 19, or 31 notes per octave may of course be tuned with equal fifths, but in these cases the fifths in the keyboard do not form a single, closed circle.

Diatonic, chromatic, and enharmonic keyboards

It is time to return to the initial question of this article, that is, of when we should call a keyboard diatonic, chromatic or enharmonic. The above considerations have explained the principles of multi-note keyboards, but not yet answered the basic question. Three basic strategies are possible when defining these categories and using the data available in Table I.

The first strategy can be called the *conservative strategy*. It tells us to call a keyboard diatonic as long as there is at least one diatonic step between two neighbouring notes; in the same way a keyboard may be called chromatic as long as there is at least one chromatic step, and enharmonic only if there is no diatonic or chromatic step in the keyboard. With this strategy, keyboards with up to 18 notes per octave are diatonic, keyboards with 19 to 30 notes per octave are chromatic, and keyboards with 31 or more notes per octave are enharmonic. Since this is clearly at variance with practice and intuition, this seems not to be a wise strategy.

The second strategy can be called the *progressive strategy*. It requires us to call a keyboard chromatic as soon as there is a single chromatic interval, and enharmonic as soon as there is a single enharmonic interval. From this procedure only keyboards with seven or fewer notes per octave are diatonic. Keyboards with 8 to 12 notes per octave are chromatic, and keyboards with 13 or more notes are enharmonic. Keyboards with 20 or more notes introduce a new interval, so that we should have another, new adjective designating these keyboards. This strategy looks as impractical as the first one.

A third strategy may be labelled the *perfectionist strategy*. This tells us to denote any quality (diatonic, chromatic, enharmonic) in the type of the keyboard. A 12-note keyboard is then diatonic-chromatic, keyboards with 13 to 18 notes are diatonic-chromatic-enharmonic, one with 19 notes is chromatic-enharmonic, the ones with more than 19 notes are chromatic-enharmonic and beyond. This strategy looks cumbersome.

4 See Rudolf Rasch, «The unification of tonal systems, or About the circle of fifths», in: *Journal of New Music Review* 29 (2000), pp. 319–334.

Table I. Numbers of step intervals in keyboards with 7 to 31 notes per octave.

Number of notes	Last added note	Diatonic whole tones	Diatonic semi-tones	Chromatic semi-tones	Diminished seconds	Down-ward doubly diminihed seconds
7	F	5	2	0		
8	F♯	4	3	1		
9	B♭	3	4	2		
10	C♯	2	5	3		
11	E♭	1	6	4		
12	G♯	0	7	5	0	
13	A♭		6	6	1	
14	D♯		5	7	2	
15	D♭		4	8	3	
16	A♯		3	9	4	
17	G♭		2	10	5	
18	E♯		1	11	6	
19	C♭		0	12	7	0
20	B♯			11	8	1
21	F♭			10	9	2
22	F♯♯			9	10	3
23	B♭♭			8	11	4
24	C♯♯			7	12	5
25	E♭♭			6	13	6
26	G♯♯			5	14	7
27	A♭♭			4	15	8
28	D♯♯			3	16	9
29	E♭♭			2	17	10
30	A♯♯			1	18	11
31	G♭♭			0	19	12

In view of the above possible strategies, it seems best to formulate a practical rule that is at the same time clear and simple, tries to conform as much as possible to existing usage, avoids the extremes of the conservative, progressive, and perfectionist strategies, and is connected with the basic properties of the keyboards, namely the various step intervals comprised in them. Before doing so, we will focus on the keyboards that represent the maximum appearances of diatonic, chromatic, and enharmonic steps that is, keyboards with 12, 19, or 31 notes per octave. In those keyboards a particular step interval reaches its maximum number of appearances: the diatonic semitone in the 12-note keyboard, the chromatic semitone in the 19-note keyboard, and the enharmonic interval in the 31-note keyboard. The keyboards with 7, 12, 19, or 31 notes per octave lay the foundations for further elaborations of the keyboard design. The addition of a note to one of these special keyboards always means the introduction of a new kind of interval: the chromatic semitone when the seven-note keyboard is further developed, the diminished second when the 12-note keyboard, the downward doubly-diminished second when a 19-note keyboard, and a further enharmonic interval when the 31-note keyboard is being developed into one with one note more to the octave. This suggests that it may be wise to adopt a double nomenclature for the keyboards with 7, 12, 19 or 31 notes per octave. They delineate groups of keyboards with fewer or more note per octave and can be considered as belonging to both the categories with fewer notes and more notes, or, in the same (or opposite?) vein belonging to neither of them. We will adopt a procedure that assigns the special keyboards to both the group with fewer notes and the group with more notes.

These observations lead to the following rules:

- A keyboard with up to and including twelve notes will be called *diatonic* because in this range the addition of a note increases the number of diatonic semitones until it reaches its maximum of seven in a 12-note keyboard (and decreases the number of diatonic whole tones until they have completely vanished in the 12-note keyboard). Analogy with the chromatic and enharmonic categories would restrict the diatonic keyboards to the range from seven to twelve notes per octave.
- A keyboard with 12 to 19 notes will be called *chromatic*, because the addition of a note increases the number of chromatic semitones until it reaches its maximum of twelve in a 19-note keyboard (and decreases the number of diatonic semitones until they have completely vanished in the 19-note keyboard).
- Finally, a keyboard with 19 to 31 notes will be called *enharmonic*, because the addition of a note increases the number of enharmonic steps until it reaches its maximum of nineteen in a 31-note keyboard (and decreases the

number of chromatic semitones until they have completely vanished in the 31-note keyboard).

- By the procedure chosen a 12-note keyboard is called *both* diatonic and chromatic, and a 19-tone keyboard *both* chromatic and enharmonic. The choice of the designation is determined by the context of the discussion.

This strategy gives, it seems, a satisfactory solution for keyboards from seven to 31 notes, but leaves open how to call keyboards with six or fewer notes per octave (a rather academic question) and how to call keyboards with more than 31 notes or keys per octave, a less academic question, but so far one with less urgency that the nomenclature for keyboards from seven to 31 notes.

Abstract

This article addresses the question of when to call a keyboard diatonic, chromatic, or enharmonic. It investigates the intervals that can be found between adjacent notes of keyboards with 7 to 31 keys per octave. It appears that keyboards with 12, 19, and 31 keys per octave enjoy a special position within the whole range in that they contain only two different types of interval between adjacent keys. The other keyboards have three such different intervals. It is concluded that the term «diatonic keyboard» may be used for keyboards with 7 to 12 keys per octave, «chromatic keyboard» for those with 12 to 19 keys per octave, and «enharmonic keyboard» for those with 19 to 31 keys per octave. From this proposal the keyboards with 12 or 19 keys per octave have double designations, which seems to conform to historical and present-day practice.

Zusammenfassung

Der Beitrag geht der Frage nach, wann eine Tastatur als diatonisch, wann als chromatisch und wann als enharmonisch bezeichnet werden kann. Dazu untersucht es die Intervalle, die zwischen benachbarten Noten auf Tastaturen mit 7 bis zu 31 Tasten pro Oktave gefunden werden können. Es stellt sich heraus, dass Tastaturen mit 12, 19 oder 31 Tasten pro Oktave eine bevorzugte Stellung einnehmen, indem sie nur zwei unterschiedliche Arten von Intervallen zwischen benachbarten Tasten aufweisen. Alle übrigen Tastaturen weisen drei verschiedene Intervalltypen auf. Es ergibt sich die Schlussfolgerung, dass der Begriff «diatonische Tastatur» nur für Tastaturen mit 7 bis 12 Tasten benutzt werden mag, «chromatische Tastatur» für solche mit 12 bis 19 Tasten pro Oktave und «enharmonische Tastatur» für solche mit 19 bis 31 Tasten pro Oktave. Nach diesem Vorschlag gibt es für Tastaturen mit 12 wie mit 19 Tasten pro Oktave eine doppelte Bezeichnung, was sowohl mit historischer wie mit heutiger Nomenklatur / Praxis konform zu gehen scheint.