

# MUSIC THEORY BASICS

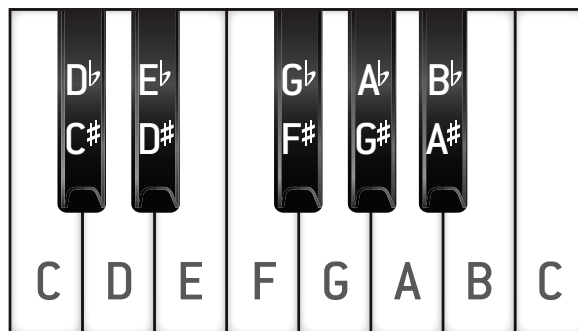
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## *Introduction*

- Welcome to the fascinating world of music theory in EZkeys and in real life. On the following pages you will be taking a guided tour through the basic principles applied in music theory, with our focus set on understanding harmony and the different chord symbols used in music today. Of course, musical creativity doesn't require knowledge of music theory – however, gaining an understanding of music theory basics will help you develop as a musician and a composer.
- EZkeys Music Theory Basics is structured to be informative and easy to follow with concise explanations of the basics. Be sure not to only read these pages, but indeed **play** the sounds and examples discussed in the text. There is little point in understanding any aspect of music theory if you don't know how to use it or how it sounds, so our tip is to do the studying close to your keyboard and check out the concepts we discuss as we move along. In this document we've included references to MIDI files found in the EZkeys Song Browser. These references will be written in *italics* in the document. Please make sure to set the Song Track in EZkeys to the key signature indicated to hear the examples as intended.
- The Music Theory Basics section of the manual includes the following chapters:
  - Explanation of keyboard
    - You will learn the basics of note names and the keyboard, and what sharps and flats are.
  - Key signatures
    - You will learn about major and minor key centers, and how to construct major and minor scales.
  - Circle of fifths
    - You will learn about the circle of fifths, and how it can be used.
  - Chord theory
    - This chapter explains what chord symbols are, and how they are constructed. You will learn about triads, intervals, adding notes and extensions to chords, and the ways in which musicians commonly interpret chords. We end this chapter with an in-depth look at all the different categories of chords used in music.
  - Sharps and flats – Simplifications in EZkeys
    - Finally we tie some loose ends by looking at theory in practice, and how the design of EZkeys simplifies this for the user.

# EXPLANATION OF KEYBOARD

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- Each piano key has its own name and to understand this we will start by looking at the white keys. As a starting point we will go from the C key and play the white keys up to the next C. We have now in fact played a C major scale – the note names follow alphabetically: C, D, E, F, G, A and B. Arriving at our next white note, we are now back to C (one octave higher), moving upwards, the note names repeat themselves in the same order.
- In between several pairs of white keys, we have a black key. Naming these keys is done in two ways. In some cases we will view the black key as being a raised version of the closest white key to the left. In other cases we will view the black key as being a lowered version of the closest white key to the right. This results in two different note names available for the same black key. If we choose the raised version we add a sharp symbol (#) after the note name, if we choose the lowered version we add a flat symbol (b) after the note name. By sharpening a note we make it higher in pitch, by flattening a note we make it lower in pitch. E.g. the black key in between D and E could either be considered a D# or an Eb. The reasons for this will be covered later in the text. Notice that you will not find any black key in between the E and F keys, and in between the B and C keys.  
You will rarely see the note names E#, Fb, B# or Cb in popular sheet music, but they do exist in certain key signatures – we will discuss this later in the section Sharps and flats – Simplifications in EZkeys.

# KEY SIGNATURES

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- Most traditional and popular music is composed and played with a strong feeling of a tonal base, a sense of where the piece sounds “at home”. If we e.g. play the chord progression of C, F, G7 to C, we have a strong sense of being resolved to “home base” – in this case you will no doubt hear that the final C chord provides a strong sense of resolution. In musical theory we are playing in the key center of C major. (*MIDI example no. 1 in C major*)  
If we instead changed the chord progression to Cm, Fm, G7 to Cm, we would now have our resolution in the Cm chord. Thus, we are now in the key center of C minor. (*MIDI example no. 2 in C minor*)  
In practical use, there are 24 different key centers, 12 major keys and 12 minor keys (each corresponding to the 12 different piano keys). These will be covered in our next section, Circle of fifths.
- To understand the concept of key centers and key signatures we will start by examining what comprises a major scale. Earlier on we constructed a C major scale by playing only the white notes from one C up to the next one. As you probably see we have two different distances, intervals, when moving up the scale. Starting from C to D, we have the distance of two piano keys (including both the white and black keys). The same is true when moving from D to E, F to G, G to A, and A to B. However, when going from E to F, and from B to C, the distance is only one piano key. In music theory, moving the interval of two piano keys up (or down) is called a *whole step*, while a single key up (or down) is called a *half step*.

Hence, to construct a major scale from any root note, the intervals (moving upwards) must be: *whole, whole, half, whole, whole, whole, half*. Or maybe easier: all *whole steps* except *half steps* between the 3<sup>rd</sup> and the 4<sup>th</sup> note, and between the 7<sup>th</sup> and 8<sup>th</sup> note.

Another basic rule in traditional scale theory is that every note name has to be in the scale one time, and one time only. There has to be only one C (or C# or Cb), and only one D (or D# or Db), and so forth.

In the case of C major we can simply play only the white notes, starting from a C note, to create a C major scale - there is no need for any sharps or flats. Each note name is in the scale one time. However, if we are to construct a major scale starting on any other given root, we will have to include either sharps or flats to have our order of whole and half steps intact.

If we e.g. are to construct a G major scale, we would start on a G note and move up a whole step to the next note, A. Next a whole step to B, a half step to C, a whole step to D, a whole step to E, a whole step to... What? As you no doubt see and hear the next note cannot be an F, since that is not the right interval jump. We have to play the black key in between F and G to have

our whole/half step-rule apply and to make the major scale sound right. How will we name this note? Well, it has to be called F# (not Gb) because *every note name has to be in the scale one time, and one time only*. We cannot have both a G and a Gb, but no F in our scale. Therefore, a G major scale spells: G, A, B, C, D, E and F#.

Now, go on and start on the root note D and see what happens. If you're doing it right, this time you will need to raise both the F and the C to F# and C# to have our whole/half step-rule apply and make the scale sound right. In this manner we also need to use several sharps in constructing the major scales from the root notes A, E, B and F#, for them to come out right in theory and in sound.

Continuing this journey, let's try to create a major scale starting on the root note F. Let's see, every note name should be in there once, but if we play only white notes starting from F it will sound fine all the way through except for the B note. You probably see and hear that we need the black note in between A and B instead. This is logical since we need a half step between the 3<sup>rd</sup> and 4<sup>th</sup> note, remember? Well, how do we name this note? It has to be called a Bb (not an A#) since we already have an A and *every note name has to be in the scale one time, and one time only*.

Now, go on and start on the root note Bb and see what happens. If you're doing it right, this time you will need to lower the B to Bb (of course), and also the E to Eb to have our whole/half step-rule apply and make the scale sound right. In this manner we also need to use several flats in constructing the major scales from the root notes Eb, Ab, Db and Gb, for them to come out right in theory and in sound.

The result when constructing all the different major scales is that we get 6 scales that need sharps and 6 scales that need flats, remembering that C major needs no sharps or flats.

The sharp key signatures are: G major (1#), D major (2#), A major (3#), E major (4#), B major (5#) and F# major (6#).

The flat key signatures are: F major (1b), Bb major (2b), Eb major (3b), Ab major (4b), Db major (5b) and Gb major (6b).

You will notice that when reaching the keys with 6 sharps and 6 flats they will sound the same but have completely different note names in them. This is, of course, because we are starting the scales from the same note (F# or Gb), which will have them sounding identical. In music theory this is called *enharmonic keys*. Also in practical use, you will rarely see key signatures with more than 6 sharps or flats, since it will then be easier to pick an enharmonic key with fewer sharps or flats. There are however pieces written in keys such as C# major (7#), G# major (8#) and Cb major (7b) – for the purpose of EZkeys we decided to exclude them since there are enharmonic

keys that most will find easier to use, and also to simplify the design and use of the circle of fifths in the program.

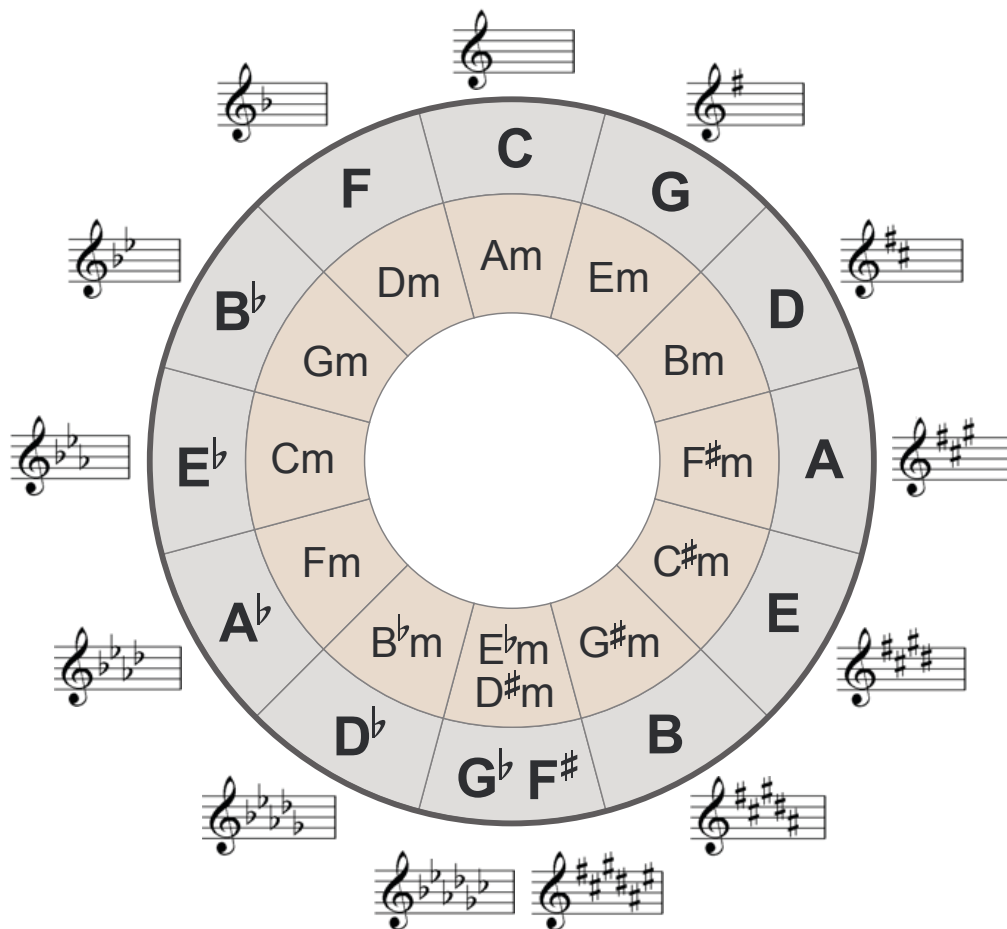
What about the minor keys, then? Well, we're happy that you asked. Each major key has a corresponding minor key that shares the same notes scale-wise. If we, again, play only the white notes on the piano keyboard, but this time begin and end with the note A, we get an A minor scale, usually called the *natural* minor scale. So, an A natural minor scale spells: A, B, C, D, E, F, G (and A again). In music theory the keys of C major and A minor are considered *relative keys*, meaning they use the same tonal material.

Finding the corresponding minor key signature to the relative major key is easy. Just move down three half steps from the major key root and you will reach its equivalent minor cousin. E.g. the relative key to F major is D minor, the relative key to A major is F# minor.

## CIRCLE OF FIFTHS

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All this sums up to the *circle of fifths*, a seminal figure in music theory:



Starting at 12 o'clock we have the parallel keys of C major and A minor with no sharps or flats. Moving clockwise to one o'clock we arrive at G major or E

minor with one sharp, starting the journey of keys with sharps in them. Moving counter-clockwise to eleven o'clock we arrive at F major or D minor with one flat, starting the journey of keys with flats in them. The distance between each new step in the circle is the interval of a *perfect fifth* (a term we will discuss further on). Moving clockwise from 12 o'clock we are using ascending fifths, moving counter-clockwise from 12 o'clock we are using descending fifths, hence the name circle of fifths. From a keyboard view a perfect fifth is the distance of seven half steps - this could also be viewed as five scale steps, remembering to count the starting key as number one.



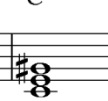



However, the circle of fifths doesn't merely show us the key signatures, it can also be used as a great help for harmonizing, composing and transposing songs. If we view these key centers as chords the general rule is that the closer two, or more, chords are within the circle, the more related they are. And contrary, the further you move away from one chord in the circle to another, the more unrelated and "out" it will sound. (Try playing a chord progression of D – Fm – Bm – Eb and you'll hear what we're talking about...) (*MIDI example no. 3 in C major*)

If e.g. we are writing a song in the key center of E, the six most used and likely chords would be E (of course) and its five closest neighbors: A, B, F#m, C#m and G#m. And if you're trying to figure out the chords to one of your favorite songs, start by identifying which key it is in, and then try using the neighbor chords found in the circle of fifths.

## CHORD THEORY

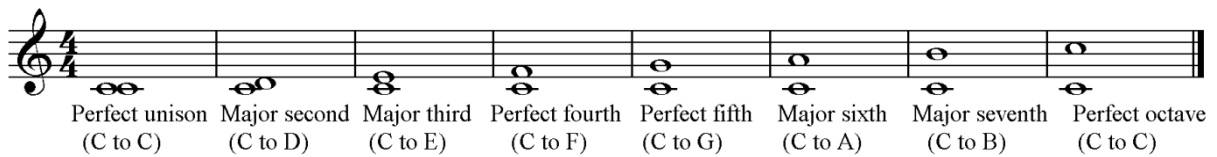
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A definition of a chord would be *three, or more, different pitches sounding simultaneously*. (If two pitches are played harmonically then all we really have is an interval called a dyad, e.g. a major third or a perfect fifth). The most basic form of chords is three-note chords, triads. The common ones are listed below, all starting on the root C in this example:

C	C <sub>m</sub>	C <sup>+</sup>	C <sup>o</sup>	C <sup>sus4</sup>	C <sup>sus2</sup>
					
(C, E, G)	(C, Eb, G)	(C, E, G#)	(C, Eb, Gb)	(C, F, G)	(C, D, G)

As you see, the first four triads share the same note names except they have sharps and flats in different places. The first chord is a *major* triad, the second a *minor* triad, the third an *augmented* triad, and the fourth a *diminished* triad. These triads are comprised of a root note, a 3<sup>rd</sup> and a 5<sup>th</sup>. The terms 3<sup>rd</sup> and 5<sup>th</sup> are names of different intervals. An interval could be defined as the distance between two notes. An in-depth look at intervals is beyond the scope of this manual, but a quick glance will help you understand

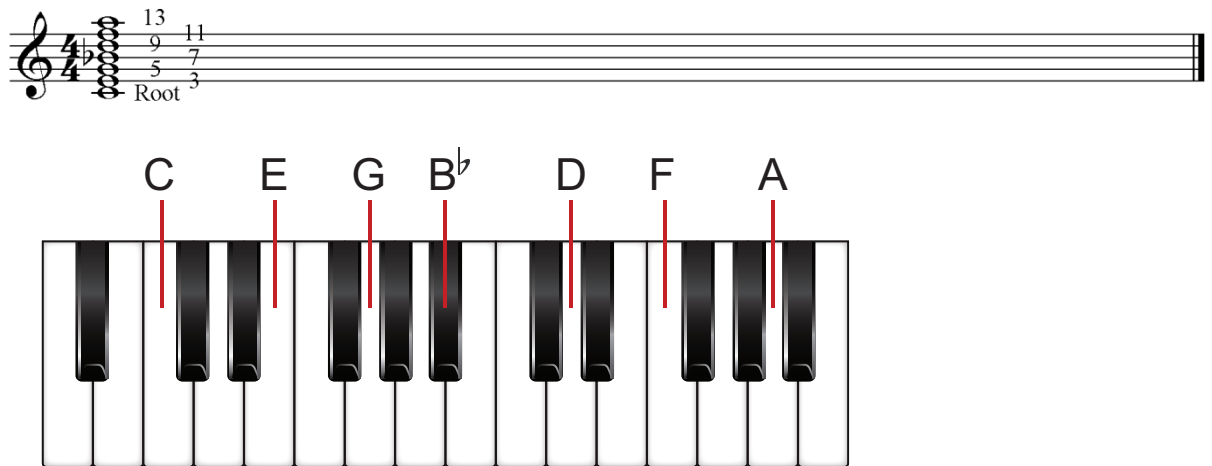
the basics of chord theory. Below is a list of the basic interval names. In this example we have listed the different intervals from the note C to the other notes in the C major scale:



If we change these intervals by adding sharps or flats to one of the notes, the rules are:

- If we make a *major* interval smaller, by raising the lower note, or lowering the higher note, it becomes a *minor* interval.
    - (E.g. a C to Db is a minor 2<sup>nd</sup>, as is a C# to D).
  - If we make a *perfect* interval smaller, by raising the lower note, or lowering the higher note, it becomes a *diminished* interval.
    - (E.g. a C to Gb is a diminished 5<sup>th</sup>, as is a C# to G).
  - If we make a *perfect* interval larger, by lowering the lower note, or raising the higher note, it becomes an *augmented* interval.
    - (E.g. a C to G# is an augmented 5<sup>th</sup>, as is a Cb to G).
- As you see, going back to the triad figure:
- a major triad is made up of a major 3<sup>rd</sup> and a perfect 5<sup>th</sup>
  - a minor triad is made up of a minor 3<sup>rd</sup> and a perfect 5<sup>th</sup>
  - an augmented triad is made up of a major 3<sup>rd</sup> and an augmented 5<sup>th</sup> (hence the name)
  - a diminished triad is made up of a minor 3<sup>rd</sup> and a diminished 5<sup>th</sup> (hence the name)
- The final two chords are *suspended* triads, meaning the third of the chord has been replaced by either the perfect fourth or the major second.
- a sus4 triad is made up of a perfect 4<sup>th</sup> and a perfect 5<sup>th</sup>
  - a sus2 triad is made up of a major 2<sup>nd</sup> and a perfect 5<sup>th</sup>
- Although triads are just fine, often you will want to add other notes to the triads to provide different sounds and more colors to your music. It is very common to add a fourth note to triads making them more colorful four-note chords. Usually, this added note is a major 6<sup>th</sup>, a minor 7<sup>th</sup> or a major 7<sup>th</sup>, but there are several other options as well. In fact, with a chord symbol like G13+11, we have seven different pitches. Exploring all the different chords is quite involved, and at first slightly confusing. But it is also great fun and guaranteed to provide you with a number of new ideas and harmonies.
- The basic principle of adding and naming notes and extensions to chord symbols is to start with the major triad and add notes on top of it. The major triad is made up of its root, 3<sup>rd</sup> and 5<sup>th</sup>. By adding minor and major 3<sup>rds</sup> corresponding to the notes of the major scale with a minor 7<sup>th</sup> (in music theory known as a mixolydian scale), we get the 7<sup>th</sup>, the 9<sup>th</sup>, the 11<sup>th</sup>, and

finally the 13<sup>th</sup>, as shown in the following figures:



- A few rules:
  - The number 7 in a chord symbol refers to the minor 7<sup>th</sup> above the root.
  - The 9<sup>th</sup> is the same note as the major 2<sup>nd</sup> (sus2-note), except one octave higher.
  - The 11<sup>th</sup> is the same note as the perfect 4<sup>th</sup> (sus4-note), except one octave higher.
  - The 13<sup>th</sup> is the same note as the major 6<sup>th</sup>, except one octave higher.
- Following this are some more rules:
  - The same numbering system applies to all types of chords.
  - Adding a higher number means that all the lower numbers are also contained within the chord. E.g. a 13-chord also includes the 11<sup>th</sup>, 9<sup>th</sup>, and 7<sup>th</sup>. (There are exceptions from this rule in practical use, which we will get to).
  - If we add the interval of a major 6<sup>th</sup> above the root, the appropriate symbol is “6” (e.g. Eb6).
  - If we add the interval of a major 7<sup>th</sup> above the root, the appropriate symbol is “maj7” (e.g. Ebmaj7).
  - By adding a “+” symbol in front of a number we raise the note a half step. You will also in sheet music sometimes see a “#” symbol, which functions in the same manner. E.g. a C7+9 chord is the same as a C7#9 chord, and tells us to play a C7 with an added sharp nine (D#, in this case).
  - By adding a “-” symbol in front of a number we lower the note a half step. You will also in sheet music sometimes see a “b” symbol, which functions in the same manner. E.g. a C7-9 chord is the same as a C7b9 chord, and tells us to play a C7 with an added flat nine (Db, in this case).
  - Using “add” in a chord symbol means to add a note to the chord. The most common “add”-chord is the add9-chord. E.g. a Cadd9

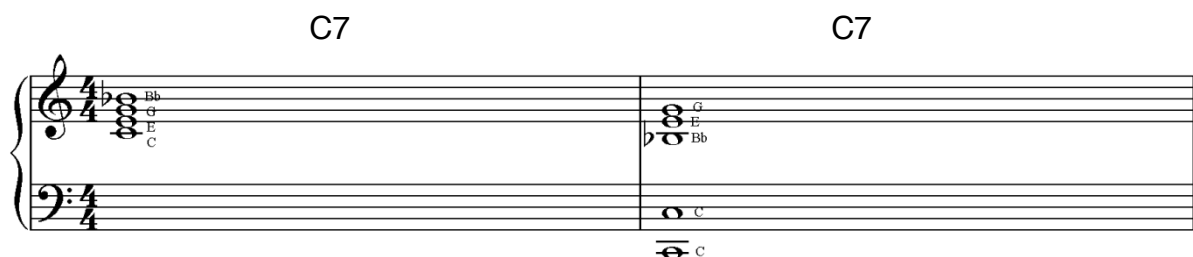


chord is made up of a C major triad (C, E, and G), with an added 9<sup>th</sup> (D). (Compared to the C9 chord, which also had the 7<sup>th</sup>, Bb, contained, a Cadd9 simply adds the 9<sup>th</sup> and nothing else).

- Using “no” in a chord symbol means to exclude a note from the chord. E.g. a C7no3 chord would consist of the notes C, G, and Bb, excluding the 3<sup>rd</sup> (E).
  - Slash chords are chords played with another bass note rather than the chord root note. A slash chord might look something like Bb/C or Dm/F (or more generally “chord/bass note”). The two examples should be interpreted as “a Bb major triad with C in the bass” and “a D minor triad with F in the bass”.
- It is also important to note that chord symbols merely suggest, in a quick and practical way, which notes to include when playing a chord. It does not tell you exactly how to voice the chord - a specific order in which the different chord notes appear is called a *chord voicing*. This is up to your own knowledge and musical instincts. Listing a C major triad earlier on, a C chord symbol doesn’t mean you have to play the notes C, E, and G in that order. At least in chord theory, you could spread out these notes anywhere on the keyboard, maybe doubling some of them, and you would still be playing a C chord. The essence is that you should try arranging the notes of a particular chord in such a way that it sounds good and complete, yet comfortable when you hit the keyboard. When you add *chord extensions* in a chord symbol, pay attention to where you put them in your chord voicing and the sound of the chord. Chord extensions are what we call the numbers 9, 11 and 13 when added to a chord. E.g. try playing the two different voicings for a C7+9 chord below and hear how the first one sounds bluesy and nice, while the second one sounds very dissonant and ugly, because the interval between the #9<sup>th</sup> and the major 3<sup>rd</sup> is an unpleasant minor 9<sup>th</sup> interval. (*MIDI example no. 4 in C major*)

<p>Common voicing:</p> <p style="text-align: center;">C<sup>7+9</sup></p> <p style="text-align: center;">(C, E, Bb, D#)</p>	<p>Ill-advised, D# and E creates a dissonant b9 interval</p> <p style="text-align: center;">C<sup>7+9</sup></p> <p style="text-align: center;">(C, D#, Bb, E)</p>
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To give you another practical example: a C7 chord comprises of C, E, G and Bb, as written out below. While it is possible to play it like this, many keyboard players would re-voice the notes, and perhaps play something like what’s written out in the second chord. This voicing consists of the same note names, but with a fuller sound to it. (*MIDI example no. 5 in C major*)



A few pointers will be given about chord voicing in the following analysis when needed, but in general we will just lay out the basic chord formula. In the following examples, all the different chords have been analyzed from a C root note. Once you understand a particular chord structure, be sure to play it over other root notes to expand your practical knowledge.

- In order to get a firm grip of all the chords and chord symbols used in music, and in EZkeys, we will categorize the chords into seven sub-groups based on their fundamental structure and function. These seven groups are:
  - Major chords
  - Minor chords
  - Dominant chords
  - Sus chords
  - Half-diminished chords
  - Diminished chords
  - Power chords

So, here we go...

## 1. Major chords

To a major triad we can add several notes and extensions, or combinations of them. In short, the notes are the 6<sup>th</sup>, the (major) 7<sup>th</sup>, the 9<sup>th</sup>, the #11<sup>th</sup>, and the 13<sup>th</sup>. It is also possible to use the #5<sup>th</sup>, although that sound is probably most used in contemporary classical and jazz music. We've also included the augmented triad in this group of chords, though it could be argued that it belongs in its own unique category. This sums up to the following list of usable major chords:

C	C <sup>+</sup>	C <sup>6</sup>	C <sup>maj7</sup>	C <sup>add9</sup>	C <sup>add9</sup> (Suggested voicing:)	C <sup>maj9</sup>	C <sup>9</sup> (same as C <sup>6</sup> add9)
(C, E, G)	(C, E, G#)	(C, E, G, A)	(C, E, G, B)	(C, E, G, B, D)	(C, D, E, G, B)	(C, E, G, B, D)	(C, E, G, A, D)

C <sup>maj7</sup> add13	C <sup>maj7-5</sup>	C <sup>maj7+5</sup>	C <sup>maj7+11</sup>	C <sup>maj9+11</sup>	C <sup>maj13+11</sup>
(C, E, G, A, B)	(C, E, Gb, B)	(C, E, G#, B)	(C, E, G, B, F#)	(C, E, G, B, D, F#)	(C, E, G, B, D, F#, A)

As you see, for the add9-chord we've supplied two alternatives. While the first one is by no means wrong, most piano players prefer the second one simply because it often sounds better, and is easier to play on the keyboard.

A few stylistic notes regarding the different chords:

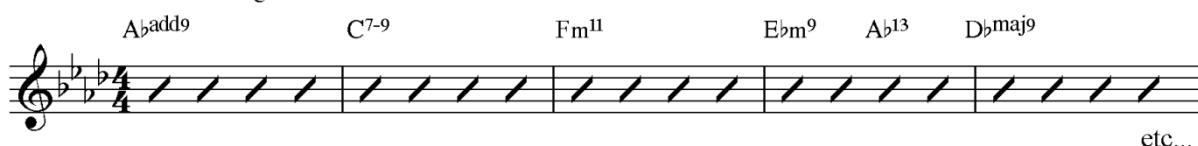
- Maj7-chords provide a gentle, sweet color often used by jazz and soul keyboardists.
- 6-chords often sound rather "jolly" in major keys. Older jazz styles, such as swing and Dixieland, relied heavily on 6-chords. Listen to the sound of the 6-chord in Madonna's "Like A Virgin" for a more recent example in pop. (*MIDI example no. 6 in F# major*)

Madonna: "Like A Virgin"



- Listen to the sound of an add9-chord in the first bar of the verses of Chaka Khan's "Through The Fire". (*MIDI example no. 7 in Ab major*)

Chaka Khan: "Through The Fire"



Add9-chords have been used extensively in many ballads, adding a sweet, romantic touch to the major chord.

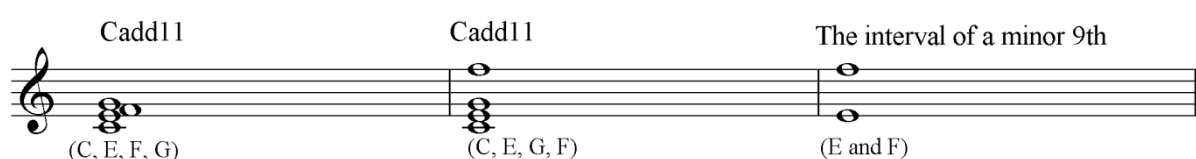
- Listen to the sound of an augmented triad in Stevie Wonder's "For Once In My Life". (*MIDI example no. 8 in F major*)

Stevie Wonder: "For Once In My Life"



This illustrates a common use of the augmented triad inserted between a major triad and a 6-chord. This makes musical sense since one of the chord voices will move from the 5<sup>th</sup> up to the augmented 5<sup>th</sup>, and finally up to the 6<sup>th</sup>.

- You might ask, “how about the regular 11<sup>th</sup>?” Well, that’s a good question. While it is possible to create and play a chord like Cadd11, it is not often used for two reasons. First, the 11<sup>th</sup> is the same note as the perfect 4<sup>th</sup>, so we have somewhat of a clash between the major third and the sus4 here. We tend to want to hear a chord either as being major **or** sus4, not both at the same time. And secondly, if we indeed play the 11<sup>th</sup> in the octave above the 3<sup>rd</sup>, matters become even worse; since the E in a lower octave and the F in a higher octave forms a minor 9<sup>th</sup> interval, which is considered the most dissonant interval of all (try it if you don’t believe us!). See below: (*MIDI example no. 9 in C major*)



However, adding a sus4 to a major triad has been used, so therefore it is included in EZkeys as an option. Listen to the sound of a F#add11 in Black Country Communion’s “Save Me”, where the chord appears in the synth pad sound at 1:20 into the song.

Another good question is “how about the minor 7<sup>th</sup>?” We will get to that since a chord including both the major 3<sup>rd</sup> and the minor 7<sup>th</sup> is considered a dominant chord.

## 2. Minor chords

Minor chord symbols are actually quite easy and very logical to grasp. To a minor triad we can add several notes and extensions, and combinations of them. These are: the 6<sup>th</sup>, the minor 7<sup>th</sup>, the major 7<sup>th</sup>, the 9<sup>th</sup>, the 11<sup>th</sup>, and the 13<sup>th</sup>. It is also possible to alter the 5<sup>th</sup> to an augmented 5<sup>th</sup> – however, with a triad this simply results in an *inversion* of another major chord. E.g. a Cm+5 chord is in fact an Ab/C. Still, we’ve included a m7+5 chord symbol, although some may argue this is an add9 chord with the 3<sup>rd</sup> in bass (e.g. a Cm7+5 is an Abadd9/C). This sums up to the following list of usable minor chords:

Cm (C, Eb, G)    Cm<sup>6</sup> (C, Eb, G, A)    Cm<sup>7</sup> (C, Eb, G, Bb)    Cm<sup>7+5</sup> (C, Eb, G#, Bb)    Cm<sup>7maj7</sup> (C, Eb, G, B)    Cm<sup>add9</sup> (C, Eb, G, D)    Cm<sup>add9</sup> (Suggested voicing) (C, D, Eb, G)  
 Cm<sup>9/9</sup> (C, Eb, G, A, D)    Cm<sup>9</sup> (C, Eb, G, Bb, D)    Cm<sup>7maj9</sup> (C, Eb, G, B, D)    Cm<sup>7add11</sup> (C, Eb, G, Bb, F)    Cm<sup>11</sup> (C, Eb, G, Bb, D, F)    Cm<sup>13</sup> (C, Eb, G, Bb, D, F, A)

Just as with major chords, it is quite common to play a minor add9-chord with the 9<sup>th</sup> down an octave (acting like a 2<sup>nd</sup>).

Much in parallel to the previous discussion concerning the major 3<sup>rd</sup> and the 11<sup>th</sup> with major chords, a flatted 6<sup>th</sup> is rarely added to a minor chord, since it clashes with the 5<sup>th</sup>, creating either a dissonant minor 2<sup>nd</sup> or minor 9<sup>th</sup> interval.

You might ask “What about the flatted 5<sup>th</sup>?” Well, if we flatten the 5<sup>th</sup> we’re turning the chord into a half-diminished or a diminished chord which we will soon get to.

A few stylistic notes regarding the different chords:

- Adding the minor 7 to a minor chord usually gives you a very subtle color. In fact, many keyboardists and guitarists in soul, funk and jazz genres probably play minor 7 chords all over the place instead of just regular minor triads.
- Minor 6 chords, and in particular minor maj7 chords, add more color. A classic way of using these chords can be heard in the chord progression of the jazz classic “My Funny Valentine” (in this case transcribed from a Stan Getz/Chet Baker-recording): (*MIDI example no. 10 in C minor*)

Stan Getz/Chet Baker: "My Funny Valentine"

Cm    Cm<sup>7maj7</sup>    Cm<sup>7</sup>    Cm<sup>6</sup>    etc...

- Play a minor maj9 chord (preferably with a wah-wah pedal) and hear the sound of a scenery change in any James Bond movie.

As you no doubt will be hearing by now, the more notes we put into the chords, the more dense and “jazzier” they sound.

### 3. Dominant chords

Moving on to dominant chords we reach our most complicated and interesting territory. This is because dominant chords have so many possibilities in terms of adding notes, extensions, and combinations of these.

First, we need to define a dominant chord. It is simply a chord that contains a major 3<sup>rd</sup> **and** a minor 7<sup>th</sup>. In other words, the starting point for dominant chords is a four-note chord, e.g. a C7 is made up of the notes: C, E, G and Bb.

Adding notes and extensions are pretty straight-forward, yet complex. Here are some general rules and theory:

- The 5<sup>th</sup> can be both flattened and sharpened. The same applies to the 9<sup>th</sup>. However, we do not use an unaltered 5<sup>th</sup> or 9<sup>th</sup> at the same time.
- A dominant chord including both a b5 or #5, and a b9 or #9 is called an altered dominant.
- When adding extensions the 9<sup>th</sup> presents no problems, but, in the same manner as the major chords, we have the issue of the clashing 3<sup>rd</sup> and 4<sup>th</sup>/11<sup>th</sup>. The general consensus is:
  - In an 11-chord we omit the 3<sup>rd</sup>, but include the 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup> and 11<sup>th</sup>. Therefore, some sheet music instead writes this chord as a 9sus4-chord, instead of an 11-chord, to avoid the confusion regarding the 3<sup>rd</sup>. In EZkeys we've chosen the 9sus4-symbol. (In practical use many musicians and composers will visualize and play a 9sus4-chord as a slash chord, comprised of its root as bass tone with a major triad a whole step below the root on top. E.g. a C9sus4 is in practice virtually the same as a Bb/C, a Ab9sus4 is the same as a Gb/Ab).
  - In a 13-chord we omit the 11<sup>th</sup>, but include the 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup> and 9<sup>th</sup>. (In practical use many musicians and composers will omit the 5<sup>th</sup>, and sometimes also the 9<sup>th</sup>, leaving the player with a less cumbersome four-note voicing consisting of root, 7<sup>th</sup>, 3<sup>rd</sup>, and 13<sup>th</sup> on top. This is easier to play, yet has the essential sound of the 13<sup>th</sup>).
- Both the 7sus4-chord and the 9sus4-chord has no major 3<sup>rd</sup> within them, yet still belongs to the dominant family due to their function within a harmonic progression. That is, like all the other dominants they share the tendency of wanting to resolve to a major or minor chord a perfect 5<sup>th</sup> down (or perfect 4<sup>th</sup> up).
- As stated earlier, dominant chords have many possibilities. This figure will make this clearer:

Possible notes to add:

Function over chord: Root   b9   9   #9   Third   Sus4 or 11   #11   b5

5   #5   13   Seventh   NOT POSSIBLE!   Root

What this shows is all the notes of the chromatic scale (all the possible notes on a keyboard, in short), and how they could possibly function in a dominant chord. As you can see all the notes can be contained except for the major 7<sup>th</sup>, which is not an option since a dominant chord by definition includes a **minor** 7<sup>th</sup>. Given that we can use combinations of many of these added notes, the possibilities are quite extensive.

So, with that in mind, here comes the list of usable dominant chords:

(C, E, G, Bb)   (C, E, G, Bb, D)   (C, G, Bb, D, F)   (C, E, G, Bb, D, A)   (C, F, G, Bb)   (C, F, G, Bb, D, A)

(C, E, Gb, Bb)   (C, E, Gb, Bb, D)   (C, E, G#, Bb)   (C, E, G#, Bb, D)   (C, E, G, Bb, Db)

(C, E, G, Bb, D#)   (C, E, Gb, Bb, Db)   (C, E, Gb, Bb, D#)   (C, E, G#, Bb, Db)   (C, E, G#, Bb, D#)

(C, E, G, Bb, F#)   (C, E, G, Bb, D, F#)   (C, E, G, Bb, D, F#, A)   (C, E, G, Bb, Db, A)   (C, E, G, Bb, D#, A)

A few stylistic notes regarding the different chords:

- Both the 9 and the 13 chords are often used by blues players for variety.
- 9sus4-chords are, due to their sweet nature, often used in ballads and other pop styles where plain 7-chords sound rather dull. Try playing a G7 to a C, then compare it to a G9sus4 to a Cadd9, and you'll get the picture. Listen to the verse chord progression of Whitney Houston's "Saving All My Love For You": (*MIDI example no. 11 in A major*)

Whitney Houston: "Saving All My Love For You"



Voilà, romance in a nutshell!

- For a more jazzy sample of the 9sus4-chord, listen to Herbie Hancock's "Maiden Voyage". Almost the entire song is built around 9sus4-chords from various roots.
- Altered dominant chords can be used to get an edgier, more aggressive sound than a regular 7-chord in jazz and funk genres. Listen to the final chord of the bridge (a D7+5+9), right before the chorus, in Incognitos "Talkin' Loud" for a perfect funk example.
- The 7+9 chord has often been used as a static "groove" chord in funk and rock. In fact, some players refer to this as "the Hendrix chord" for obvious reasons. Listen to "Purple Haze" by The Jimi Hendrix Experience and hear a LOUD example of Jimi tearing it up. (*MIDI example no. 12 in E major*)

The Jimi Hendrix Experience: "Purple Haze"



## 4. Sus chords

Moving on to the last four sub-groups you will be delighted to hear that they are very small.

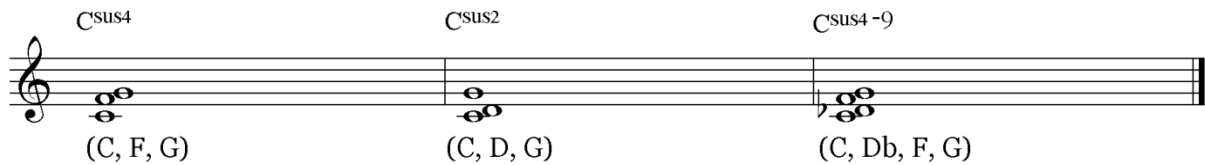
Listen to the intro to John Lennon's "Woman" and hear the sound of sus chords. (*MIDI example no. 13 in Eb major*)

John Lennon: "Woman"



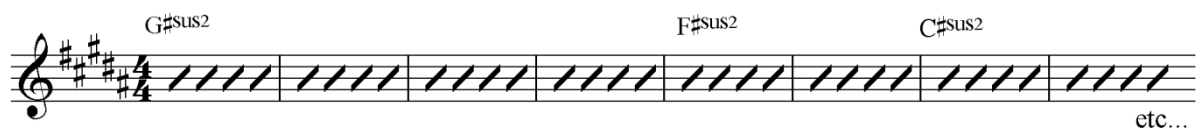


Looking at triads, we already discussed sus chords and here they are again, with an additional four-note sus4-9 chord. This chord might not be the most common one in pop-styled music, yet sounds totally authentic, and somewhat aggressive, in styles of flamenco and jazz/fusion. This chord doesn't really have an acknowledged name, people have interpreted it in several ways (e.g. Db-5/C), but sus4-9 is probably the best option.



The sus4 triad, in particular, is often being used as an embellishment chord before resolving to the expected major triad. However, many songs use sus chords without this resolution to great musical results. Sus chords have in this case a special open, “empty”, quality that might be interesting to explore. Listen to the intro and verses of Mr. Mister’s 80’s hit song “Broken Wings” for a sample. (*MIDI example no. 14 in G# minor*)

Mr. Mister: "Broken Wings"



## 5. Half-diminished chords

Next up are half-diminished chords. A *half-diminished chord* is simply a m7-chord with a flatted 5<sup>th</sup>. That's it!

You may wonder why we need this as a separate group, or why they don't belong to the minor chords. This is because the flatted 5<sup>th</sup> radically changes the sound and **function** of the chord. A perfect 5<sup>th</sup> is a solid foundation in any chord, making it very stable. But when it is flattened the chord becomes unstable and needs to be resolved somehow. You could hardly imagine a jam session scene with someone crying out: "Hey folks, let's jam over a Cm7-5 chord!!!"

Listen to Gary Moore's "Still Got The Blues" in the key of A minor, and hear the sound of a half-diminished chord in bar 5. (*MIDI example no. 15 in A minor*)

Gary Moore: "Still Got The Blues"

The image shows two staves of musical notation in 6/8 time. The first staff contains four measures with chords Dm7, G<sup>9</sup>sus4, Cmaj7, and Fmaj7. The second staff contains three measures with chords Bm<sup>7-5</sup>, E<sup>7</sup>, and Am<sup>7</sup>, followed by the text "etc...".

The most common use of the half-diminished chord is it being part of a chord progression leading through a dominant seventh chord to a minor chord, and in this example you hear how beautiful a half-diminished chord appears in a proper context. This particular harmonic progression, or versions of it, have been used in many songs - jazz standards "Autumn Leaves" and "Fly Me To The Moon", Gloria Gaynor's disco classic "I Will Survive", and Santana's instrumental "Europa" to name a few.

Usually no notes are added or extended to this, with the exception of the 11<sup>th</sup>. (Jazz musicians do sometimes add a natural 9<sup>th</sup>, also). This makes our list kind of...short.

The image shows two staves of musical notation. The first staff shows the Cm<sup>7-5</sup> chord with notes C, Eb, Gb, and Bb, labeled as (C, Eb, Gb, Bb). The second staff shows the Cm<sup>7-5</sup>add11 chord with notes C, Eb, Gb, Bb, and F, labeled as (C, Eb, Gb, Bb, F).

Note that the top three notes of the half-diminished chord forms a minor triad a minor 3<sup>rd</sup> above the root. Therefore a half-diminished chord can also be written as a slash chord, e.g. a Cm7-5 can also be written Ebm/C.

## 6. Diminished chords

Listen to Alicia Keys lovely ballad "If I Ain't Got You", and hear the sound of a diminished chord in the sixth bar of the verse, creating a beautiful passing chord in between Gmaj7 and Am7. (*MIDI example no. 16 in G major*)

Alicia Keys: "If I Ain't Got You"

Chord progression for Alicia Keys' "If I Ain't Got You":

Staff 1: Gmaj7, Em7, Am7, D

Staff 2: Gmaj7, G#<sup>o</sup>7, Am7, D, etc...

Diminished chords also constitute their own little sub-group due to their unique structure and function. Earlier on when we discussed triads we identified the diminished triad. However, much more frequently you will hear a fourth note added to the triad. Simply put, *diminished chords are built from stacking minor 3<sup>ds</sup> on top of each other*. There are usually no added notes or extensions to these chords so the list is again very short.

Diminished chords and their notes:

- C<sup>o</sup>: (C, Eb, Gb)
- C<sup>o</sup>7: (C, Eb, Gb, Bbb)
- or: C<sup>o</sup>7: (C, Eb, Gb, A)

Note that the added 7<sup>th</sup> is a diminished 7<sup>th</sup> (indicated by the little circle). In the four-note version both the 5<sup>th</sup> and the 7<sup>th</sup> are diminished. If a major interval is made smaller, it becomes minor. If a minor interval becomes even smaller, it becomes diminished. And this is exactly what's going on here. The Bbb note is a diminished 7<sup>th</sup> interval above the C root. Double sharps (##) and double flats (bb) will be discussed further on in this document.

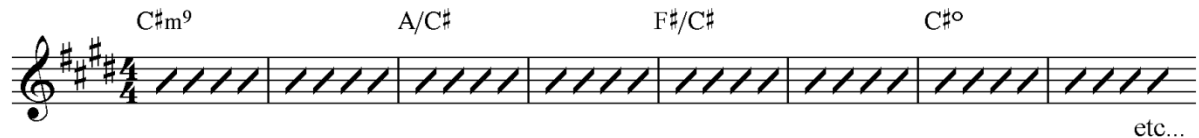
Regarding diminished chords there's a general consensus that you can override strictly theoretical aspects and instead rewrite "weird" note names to more easily accessible ones. In the previous example, we're pretty sure most musicians would rather visualize an A than a B note with two flats. Another example: in strict theory, a Db diminished7-chord would spell Db, Fb, Abb, and Cbb. Now, what is that? Well, if we simply rewrite some of the note names to their enharmonic equivalents (as we've done in EZkeys and usually in actual life), the notes are Db, E, G and Bb instead, making life easier for everyone.

Diminished chords are most often used as passing chords due to their very unstable nature. They seek to resolve very strongly. The most common use is to resolve a diminished chord up a half step to either a major or a minor chord. Try playing the chord progression of Cmaj7 to C#dim7 to Dm7, and you'll hear what we're talking about. (*MIDI example no. 17 in C major*) Interestingly, a diminished chord can also resolve beautifully to the next chord a half step below. Try playing the chord progression of Cmaj7 to Ebdim7 to Dm7, and you'll hear the effect of that. (*MIDI example no. 18 in C major*)

Listen to the intro to Michael Jackson's megahit "Thriller", for a sample of the diminished triad in action.

When the synth pad strings enters, the chords are as below:  
(MIDI example no. 19 in C# minor)

Michael Jackson: "Thriller"



This is also a great example of the effect of different chords on top of a static bass note.

A final observation: since the four-note dim7-chord is built from stacking minor 3<sup>rd</sup>s on top of each other, it has a symmetrical structure. In effect, that means that each dim7-chord shares its four notes with three other dim7-chords, built on the roots of the remaining chord tones. E.g. a Cdim7 chord consists of the notes C, Eb, Gb and A, an Ebdim7 chord consists of the notes Eb, Gb, A and C, and so forth...

## 7. Power chords

Listen to the sound of power chords to the riff of Bachman Turner Overdrive's "Not Fragile". (MIDI example no. 20 in A minor)

Bachman Turner Overdrive: "Not Fragile"

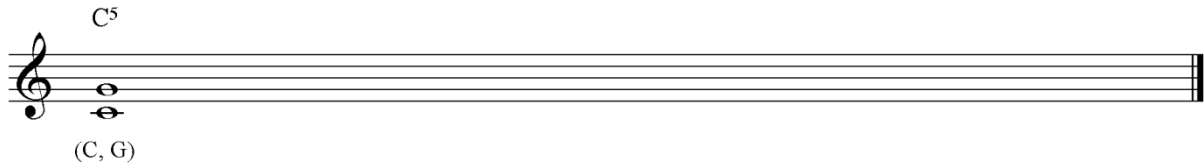


Our final sub-group of chords is even smaller; it merely consists of one chord, the power chord. Since the dawn of rock music, musicians have often just played the interval of a perfect 5<sup>th</sup> from different roots to harmonize songs, instead of regular chords. The reasons for this are probably two; first, a perfect 5<sup>th</sup> interval has by nature a very consonant, powerful and heavy sound, lending itself well to heavy rock music. Secondly, because heavily distorted electric guitars are such an integral part of rock, hard rock and metal music, the 5<sup>th</sup> interval is ideal due to its consonant nature – adding more notes, such as 3<sup>rd</sup>s or 7<sup>ths</sup> or 9<sup>ths</sup>, simply doesn't sound good through a

screaming guitar amp, creating a mushy, undefined sound. There are countless rock songs built around power chords.

From a theoretical standpoint, the power chord is actually an interval made up of two notes, a dyad, but since it has become so common in use, it has earned its own chord name, and we've included it in EZkeys. You rarely add notes to this one, and if you would, the chord would probably transform into another chord, such as a major, minor or sus2.

So here is the (very) short list:



- As an overview of all this information, we've put together a complete chart of all the chords used in EZkeys:

## All chords used in EZkeys

### 1. Major chords

C C<sup>+</sup> C<sup>6</sup> C<sup>maj7</sup> C<sup>add9</sup> C<sup>add9</sup> C<sup>maj9</sup> C<sup>6/9</sup>  
 (Suggested voicing:)

C<sup>maj7add13</sup> C<sup>maj7-5</sup> C<sup>maj7+5</sup> C<sup>maj7+11</sup> C<sup>maj9+11</sup> C<sup>maj13+11</sup>

(C, E, G) (C, E, G<sup>#</sup>) (C, E, G, A) (C, E, G, B) (C, E, G, D) (C, D, E, G) (C, E, G, B, D) (C, E, G, A, D)  
 (C, E, G, A, B) (C, E, G<sup>b</sup>, B) (C, E, G<sup>#</sup>, B) (C, E, G, B, F<sup>#</sup>) (C, E, G, B, D, F<sup>#</sup>) (C, E, G, B, D, F<sup>#</sup>, A)

### 2. Minor chords

C<sup>m</sup> C<sup>m6</sup> C<sup>m7</sup> C<sup>m7+5</sup> C<sup>maj7</sup> C<sup>madd9</sup> C<sup>madd9</sup>  
 (Suggested voicing:)

C<sup>m6/9</sup> C<sup>m9</sup> C<sup>maj9</sup> C<sup>m7add11</sup> C<sup>m11</sup> C<sup>m13</sup>

(C, E<sup>b</sup>, G) (C, E<sup>b</sup>, G, A) (C, E<sup>b</sup>, G, B<sup>b</sup>) (C, E<sup>b</sup>, G<sup>#</sup>, B<sup>b</sup>) (C, E<sup>b</sup>, G, B) (C, E<sup>b</sup>, G, D) (C, D, E<sup>b</sup>, G)  
 (C, E<sup>b</sup>, G, A, D) (C, E<sup>b</sup>, G, B<sup>b</sup>, D) (C, E<sup>b</sup>, G, B, D) (C, E<sup>b</sup>, G, B<sup>b</sup>, F) (C, E<sup>b</sup>, G, B<sup>b</sup>, D, F) (C, E<sup>b</sup>, G, B<sup>b</sup>, D, F, A)

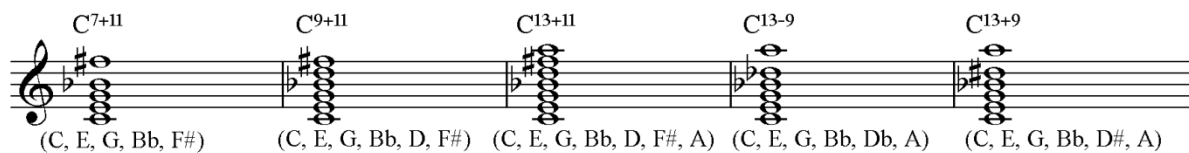
### 3. Dominant chords

C<sup>7</sup> C<sup>9</sup> C<sup>9sus4</sup> C<sup>13</sup> C<sup>7sus4</sup> C<sup>13sus4</sup>


C<sup>7-5</sup> C<sup>9-5</sup> C<sup>7+5</sup> C<sup>9+5</sup> C<sup>7-9</sup>

C<sup>7+9</sup> C<sup>7-9-5</sup> C<sup>7+9-5</sup> C<sup>7-9+5</sup> C<sup>7+9+5</sup>

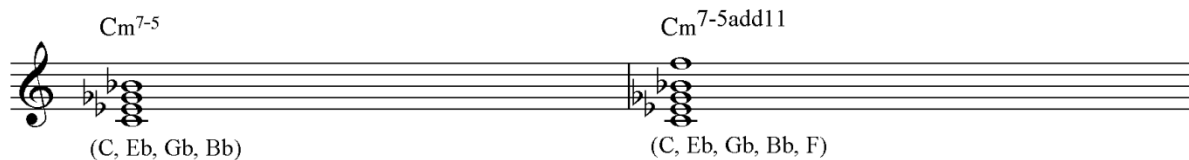
(C, E, G, B<sup>b</sup>) (C, E, G, B<sup>b</sup>, D) (C, G, B<sup>b</sup>, D, F) (C, E, G, B<sup>b</sup>, D, A) (C, F, G, B<sup>b</sup>) (C, F, G, B<sup>b</sup>, D, A)  
 (C, E, G<sup>b</sup>, B<sup>b</sup>) (C, E, G<sup>b</sup>, B<sup>b</sup>, D) (C, E, G<sup>#</sup>, B<sup>b</sup>) (C, E, G<sup>#</sup>, B<sup>b</sup>, D) (C, E, G, B<sup>b</sup>, D<sup>b</sup>)  
 (C, E, G, B<sup>b</sup>, D<sup>#</sup>) (C, E, G<sup>b</sup>, B<sup>b</sup>, D<sup>b</sup>) (C, E, G<sup>b</sup>, B<sup>b</sup>, D<sup>#</sup>) (C, E, G<sup>#</sup>, B<sup>b</sup>, D<sup>b</sup>) (C, E, G<sup>#</sup>, B<sup>b</sup>, D<sup>#</sup>)

$C^{7+11}$   $C^{9+11}$   $C^{13+11}$   $C^{13-9}$   $C^{13+9}$   
  
 (C, E, G, Bb, F#) (C, E, G, Bb, D, F#) (C, E, G, Bb, D, F#, A) (C, E, G, Bb, Db, A) (C, E, G, Bb, D#, A)

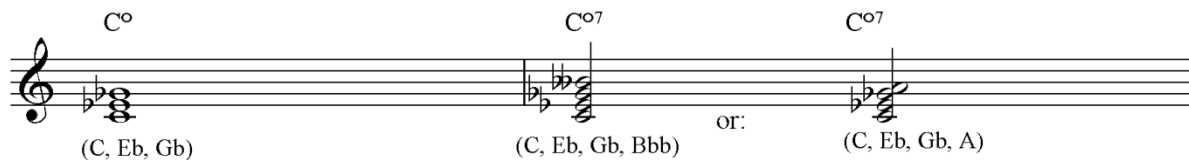
#### 4. Sus chords

$C^{sus4}$   $C^{sus2}$   $C^{sus4-9}$   
  
 (C, F, G) (C, D, G) (C, Db, F, G)

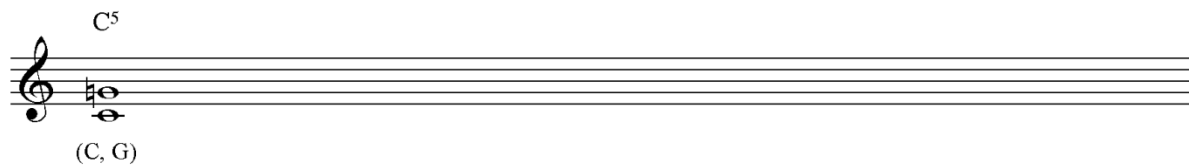
#### 5. Half-diminished chords

$C_m^{7-5}$   $C_m^{7-5add11}$   
  
 (C, Eb, Gb, Bb) (C, Eb, Gb, Bb, F)

#### 6. Diminished chords

$C^\circ$   $C^{\circ 7}$   $C^{\circ 7}$   
  
 (C, Eb, Gb) (C, Eb, Gb, Bbb) or: (C, Eb, Gb, A)

#### 7. Power chords

$C^5$   
  
 (C, G)

# SHARPS AND FLATS – SIMPLIFICATIONS IN EZKEYS

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- In the process of creating EZkeys our goal was that it should be clear, concise and simple to use. Sometimes however, music is not all that simple. In particular, it might be perplexing why certain notes will be named with a sharp the first time, and then with a flat the next time. Generally the chosen note name(s) is driven by two main concerns: 1) “what key are we playing in?” and 2) “how does the note relate to the rest of the chord?”

Regarding keys, the general idea is that if the song is in a key with sharps in its signature, the roots of the chords in the progression should have sharps, rather than flats - when necessary. Or the other way around; in a flat key signature we stick to flats, rather than sharps. Below are two examples:



As you can see, naming a chord Gbm in the key of D major is wrong; since we're in a sharp key it has to be called F#m. And, of course, we should avoid C# in favor of a Db in a flat key.

Regarding note relations within the chord, the same idea as with keys apply. We try to stick to either sharps or flats, not both at the same time. (This is usually not a problem with most chords, but we need to set this rule aside from time to time, e.g. there are a number of dominant chords with both sharps and flats (+ or -) due to alterations of chord notes).

Also, it is important that an alternative bass note in a slash chord symbol bears a proper note name. E.g. if the bass note is the 3<sup>rd</sup> of the chord, it has to be named as a 3<sup>rd</sup>. Or, if the 5<sup>th</sup> is the bass note it has to be named as the 5<sup>th</sup>. Below are two examples:



Ex1:                      Correct!                      Incorrect!

Ex2:                      Correct!                      Incorrect!

In example 1, the bass note of the second chord has to be spelled C#, not Db for two reasons. First, we are in a sharp key, not a flat one. Secondly, the bass note is the third of the A triad. A third on top of an A note is a C of some kind (here, C#), not a D of some kind.

In example 2, the bass note of the first chord is an Eb, not a D#. This time we are in a flat key signature, so flats are preferred. Also, having both a flat and a sharp for note names in a chord symbol is to be avoided. Furthermore, the alternative bass note functions as the 5<sup>th</sup> of the Ab triad – a 5<sup>th</sup> on top of an Ab note is a E of some kind (here, Eb), not a 4<sup>th</sup> of some kind (which would be a D of some kind).

- Certain note names are a bit confusing at first. Why do we need to call a certain note Cb when I clearly can see myself playing a B? Or E# instead of F? Or even worse, why do I ever need a double sharp or a double flat? Well, let's see if we can shed some light on this matter.

In certain keys with many sharps or flats in its signature, we need these “weird” note names to make sense. Consider the key of F# major. Remember how we stated that in each major scale *every note name has to be in the scale one time, and one time only*. The scale spells:

F# major scale

Playing this at the piano, you will no doubt **see** the seventh note as an F. However in a major scale (which sets the ground for the key signature) we cannot have both an F# and an F, but no E at all. Therefore, in this key, the seventh note has to be spelled E#.

Much in the same manner, the key of Gb major presents us with a “weird” note name.

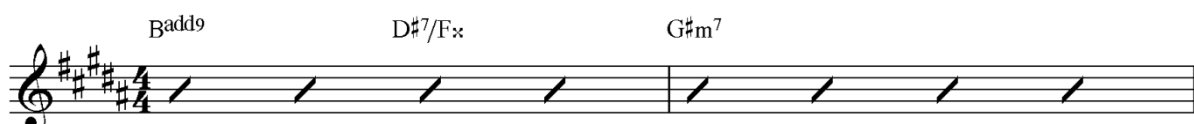
### Gb major scale



Here, the Cb note certainly **looks** as if we are playing a B, but since there is already a Bb in the scale and we need a C of some kind, we have to call the fourth note a Cb.

- Let's take a look at double sharps and double flats, and why they are sometimes needed from a theoretical standpoint.

Suppose you're writing a nice ballad in the key of B major. You start off with a Badd9 going to G#m7. This sounds fine, but you want to add some more spice to it and find that inserting a D#7 chord in between them sounds great, creating a nice lead-in chord to the G#m7. Furthermore, let's suppose you decide to put the 3<sup>rd</sup> in the bass of the D#7 chord creating a slash chord symbol. What would we call that chord? Well, playing it on the keyboard it sure looks like that bass note is a G, but from a theoretical standpoint we are indeed playing an F##. Why? Because the 3<sup>rd</sup> of a chord built on any kind of D root has to be some kind of F, and in this case the D# calls for an F## for its 3<sup>rd</sup>. So, in notation this would read:



In sheet music a double sharpened note has the “cross-stick” symbol you see afterwards. Still, many times you will instead see two sharp signs afterwards.

For practical use, most musicians would rather not have to deal with note names like these. Therefore it is generally considered ok to enharmonically re-spell chord symbols that would otherwise include double sharps or double flats, for ease of reading. The previous example could then be re-written:



More convenient, right?

Another scenario; let's again suppose you're writing a nice ballad but this time in the key of Gb major. You start off with a Gbadd9 going to Cbadd9. Then you decide to continue with a Cbm6 chord which sounds really sweet.

Furthermore you decide to put the 3<sup>rd</sup> in the bass for that chord, because it sounds even sweeter. What would you call it? Sorry guys, but a correct strict theoretical spelling in that key would be Cbm6/Ebb, looking like this in notation.



You would probably rather read (and understand) it like this:



As you no doubt noticed, most of these “weird” note names seem to occur in key signatures with many sharps or flats, and in particular with the 3<sup>rd</sup> in chords.

Generally, in EZkeys, we have tried to write out chord symbols without double sharps or double flats, but if they do occur you now have an understanding for the underlying theoretical perspective.