

ByteNoise

Keys and chords

Almost all modern Western music is made in twelve tone equal temperament. This means that if you want to make accessible, popular music, you need to learn at least a little bit about how keys and chords work in order to write songs that are in tune.

Keys

If you look at a musical keyboard, you'll notice a repeating pattern consisting of twelve keys: seven white ones and five black ones. Each of these keys represents one of the twelve notes in twelve tone equal temperament. The actual names of some of the notes change slightly depending on context, but it's not as confusing as it might sound at first. Starting with the white key directly before the two black ones, they can be named C, C[?], D, D[?], E, F, F[?], G, G[?], A, A[?], and B. They can also be named C, D[?], D, E[?], E, F, G[?], G, A[?], A, B[?], and B. The black keys are the sharp or flat notes, and the white keys are the natural notes (meaning they are neither flat nor sharp).

So we have twelve different notes to work with, until we're up an octave and playing those same twelve notes again, only at double the pitch. Most of the time, though, the notes you'll hear played at any given time will be from an even narrower selection than twelve possibilities. To further limit our choice of notes to play, we'll generally stick to a single key per song. This meaning of the word "key" doesn't mean a physical key on the keyboard.

Playing in a key basically means picking only seven notes to play out of those twelve.

You can't just make up any seven notes to play, however. For each note on the keyboard, there are two different sets of keys that it forms the basis of: a major one, and a minor one. Minor keys are a bit more complicated than major ones, but I'm going to treat them the same for the purposes of this article. If you want to learn how to play in minor keys properly, you'd do well to read a good book on music theory.

Here's a list of all the different keys, and the notes in them:

Major keys

Key

C	D	E	F	G	A	B
D?	E?	F	G?	A?	B?	C
D	E	F?	G	A	B	C?
E?	F	G	A?	B?	C	D
E	F?	G?	A	B	C?	D?
F	G	A	B?	C	D	E
F?	G?	A?	B	C?	D?	E? (F)
G	A	B	C	D	E	F?
A?	B?	C	D?	E?	F	G
A	B	C?	D	E	F?	G?
B?	C	D	E?	F	G	A
B	C?	D?	E	F?	G?	A?

Minor keys

Key

C	D	E?	F	G	A?	B?
C?	D?	E	F?	G?	A	B
D	E	F	G	A	B?	C

D?	E? (F)	F?	G?	A?	B	C?
E	F?	G	A	B	C	D
F	G	A?	B?	C	D?	E?
F?	G?	A	B	C?	D	E
G	A	B?	C	D	E?	F
G?	A?	B	C?	D?	E	F?
A	B	C	D	E	F	G
B?	C	D?	E?	F	G?	A?
B	C?	D	E	F?	G	A

As you can see, if you want to compose a piece of music in the key of C major, it's fairly easy: just stick to the notes represented by the white keys on the keyboard, namely C, D, E, F, G, A and B. If you want to compose something in the key of E? major, on the other hand, you have to stick to the notes E?, F, G, A?, B?, C and D.

You can occasionally include notes which lie outside the music's key, but not too often. If you play too many of these, the music starts to sound out of key. It's hard to say where to draw the line with including these outsider notes, but good practice — at least for a beginner — is to keep it to a minimum.

The reasons for the dual naming of the black notes should be a bit clearer after looking at the above pair of tables: it's a convenient way of labeling the notes in order to ensure that for any given key, you'll always get exactly one C note, exactly one D note, and so on. Some may be sharp or some may be flat, but there'll always be exactly one note for each of the seven letters.

Unfortunately, this naming convention falls apart a bit when it comes to the keys of F? major and D? minor. In order to crowbar it into this naming scheme, you have to pretend that the note F is called E?. This is a pretty confusing flaw in this whole

key system, but otherwise the system works well, so you'll just have to remember this one exception.

OK, so now you know which seven notes are in each key, let's find out which chords are in each key too.

Chords

Each key has six chords in it: three major chords and three minor chords. Let's look at another pair of tables to see which chords are in which keys:

Major keys

Root major chord	Minor chord	Minor chord	Major chord	Major chord	Relative minor chord	
C	D	E	F	G	A	B
D?	E?	F	G?	A?	B?	C
D	E	F?	G	A	B	C?
E?	F	G	A?	B?	C	D
E	F?	G?	A	B	C?	D?
F	G	A	B?	C	D	E
F?	G?	A?	B	C?	D?	E? (F)
G	A	B	C	D	E	F?
A?	B?	C	D?	E?	F	G
A	B	C?	D	E	F?	G?
B?	C	D	E?	F	G	A
B	C?	D?	E	F?	G?	A?

Minor keys

Root minor	Relative major	Minor chord	Minor chord	Major chord	Major chord
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chord		chord				
C	D	E?	F	G	A?	B?
C?	D?	E	F?	G?	A	B
D	E	F	G	A	B?	C
D?	E? (F)	F?	G?	A?	B	C?
E	F?	G	A	B	C	D
F	G	A?	B?	C	D?	E?
F?	G?	A	B	C?	D	E
G	A	B?	C	D	E?	F
G?	A?	B	C?	D?	E	F?
A	B	C	D	E	F	G
B?	C	D?	E?	F	G?	A?
B	C?	D	E	F?	G	A

Sticking with our previous examples, the key of C major consists of the chords C major, D minor, E minor, F major, G major and A minor. The key of E? major, on the other hand, consists of the chords E? major, F minor, G minor, A? major, B? major and C minor.

Notice that the names of the chords of a key, if you ignore the major and minor parts, are the same as the names of its notes, except that one of the notes doesn't have a corresponding chord. For major keys, this is always the last note; for minor keys, it's always the second. In other words, these tables are the same as the last pair, except the major table doesn't use the last column and the minor table doesn't use the second column.

If all of these lists seem a bit overwhelming, don't worry. No one's going to ask you to memorise them overnight. Classically trained musicians spend hours and hours practicing playing the notes of all the different keys, called scales, just playing the seven notes of each key again and again. Comparatively, composers of modern electronic music have it lucky. It's

perfectly acceptable for us to look up which notes and chords are in a key before we start playing anything. Of course, practicing scales can still help, especially if you want to compose spontaneously or perform your music in front of a live audience.

The most common chords (and the only kind I'm going to cover in this article) are called primary triads. As the name suggests, these chords consist of three notes each. Each chord starts off with the note in its name. Major chords miss three notes before the middle one, then miss another two before the last one. So the chord of C major includes the note C, then misses C?, D and D?, includes E, misses F and F?, and includes G. Conversely, minor chords miss two notes before the middle one, then miss another three before the last one. So the chord of C minor includes C, E? and G. You don't need to remember any of this, though, because there's yet another pair of tables you can use to look the notes up:

Major keys

Root note		Third		Fifth		
C	D	E	F	G	A	B
D?	E?	F	G?	A?	B?	C
D	E	F?	G	A	B	C?
E?	F	G	A?	B?	C	D
E	F?	G?	A	B	C?	D?
F	G	A	B?	C	D	E
F?	G?	A?	B	C?	D?	E? (F)
G	A	B	C	D	E	F?
A?	B?	C	D?	E?	F	G
A	B	C?	D	E	F?	G?

B?	C	D	E?	F	G	A
B	C?	D?	E	F?	G?	A?

Minor keys

Root note		Third		Fifth		
C	D	E?	F	G	A?	B?
C?	D?	E	F?	G?	A	B
D	E	F	G	A	B?	C
D?	E? (F)	F?	G?	A?	B	C?
E	F?	G	A	B	C	D
F	G	A?	B?	C	D?	E?
F?	G?	A	B	C?	D	E
G	A	B?	C	D	E?	F
G?	A?	B	C?	D?	E	F?
A	B	C	D	E	F	G
B?	C	D?	E?	F	G?	A?
B	C?	D	E	F?	G	A

Note that this pair of tables consists of just the first, third and fifth columns from the other two pairs of tables.

Another way you can look at it, is to stick with the first table. Look up the row for the key you're in, and find the letter for the chord you want. The notes of the chord are that note, then the note that's two to the right of it, then the note that's two to the right of that. Just wrap around back to the first column if you reach the last column of the table.

Summary

So, to summarise with an example, if you chose to write a piece of music in E? major, it would consist of pretty much just the notes E?, F, G, A?, B?, C and D. You can use three major

chords, E? major, A? major and B? major, and three minor chords, F minor, G minor, and C minor. These chords consist of the notes E?, G, B?; A?, C, E?; B?, D, F; F, A?, C; G, B?, D; and C, E?, G.

One of the cool things about twelve tone equal temperament is that you can combine all three of these tables — notes in keys, chords in keys, and notes in chords — into one single table. If you're anything like me, you may want to bookmark this table so that you can come back to it while composing, so I'm including it on a page of its own.

Of course, you can take all of this theory with a pinch of salt. I'm not an expert in music theory, as you've no doubt gathered. One of my most pleasant pieces of harmonic music, Sea of Calm, consists of three chords, two of which I can't even name — I just played groups of three notes that were in the key of C major and weren't adjacent.

I hope this helps get you off to a good start with making melodic and harmonic music. If you didn't understand a word of it, then for now you can always cheat and play only the black keys on the keyboard. If anyone asks, say it's a pentatonic scale. It worked for me on my Bondi EP, at any rate.