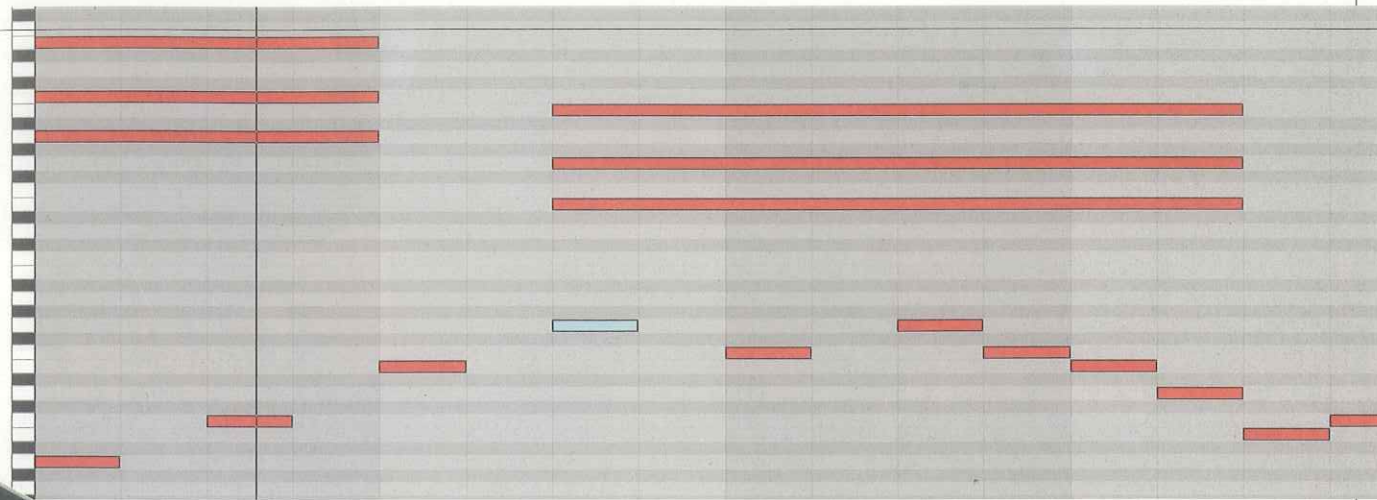


Electronic music software is a great tool for studying music theory—the basic rules of scales and harmony composers have been using for hundreds of years. **Warp Academy instructor Michael Maricle** explains why and how to get started.

A basic knowledge of music theory helps this producer use Ableton Push's preset scales to create a bassline.

A High Tech Approach to

MUSIC



This Ableton Live screen shows A minor and E minor chords playing over an A minor bassline.

Music theory: The phrase sounds scientific and formal, even a bit geeky. Classical composers and jazz musicians study it. But today's music software and digital hardware make it possible for seemingly anyone to make finished tracks without formal training. So why should electronic musicians bother to learn theory?

Because theory helps us understand how music works. It tells us why certain melodies and harmonies sound pleasing and others clash. It gives us a starting point for matching chords and scales. It helps us structure our music and take our ideas further. Just as important, the same principles of music theory apply to any style of music, from classical to jazz to pop, R&B, and EDM.

I teach theory to electronic musicians at The Warp Academy, using Ableton Live software, a keyboard, and an instrument called the Ableton Push. Music creation software such as Live (and other similar apps) gives electronic musicians an incredible array of sounds with which to explore a nearly endless universe of musical ideas. Yet many electronic dance tunes seem to get stuck on one chord. Why? Often, it's because the producers/composers simply don't know where to go next.

Many electronic music creators, especially those producing dance music, build their songs around a strong bass line. They know more about beats and sound design than they do about scales and chords. Some of my students tell me that they simply don't know which chords to use with their bass lines. Others are tired of using the same chords over and over and want to know how to make more complex harmonies. By learning music theory, they can break such creative roadblocks much more easily.

If you were to take a traditional theory class in high school, you'd probably start by learning basic information about the staff, the clefs, intervals, and the 12 major and minor keys. You'd then move on to concepts like the chromatic scale, diatonic scales, and accidentals (the sharps, flats, and natural signs that are used to indicate that a note isn't in the current key signature), eventually moving on to advanced harmony and other concepts.

Electronic music technology gives you a unique way to see and hear many of these ideas in action. And it doesn't require that you learn to read or write traditional music notation. (However, combining a knowledge of theory with the ability to read and notate music will allow you to become a more complete musician and composer.) That said, computers give us another way to study and apply music theory.

Software programs like Ableton Live, GarageBand, and others, can display notes on a graph, or grid, which is divided into half-steps (a.k.a. *semitones*). This display makes it easy to see the distances (or *intervals*) between the notes. Music software also allows you to enter

Theory

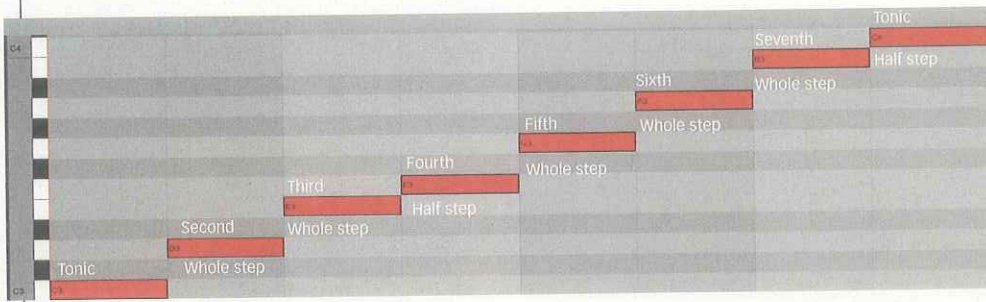
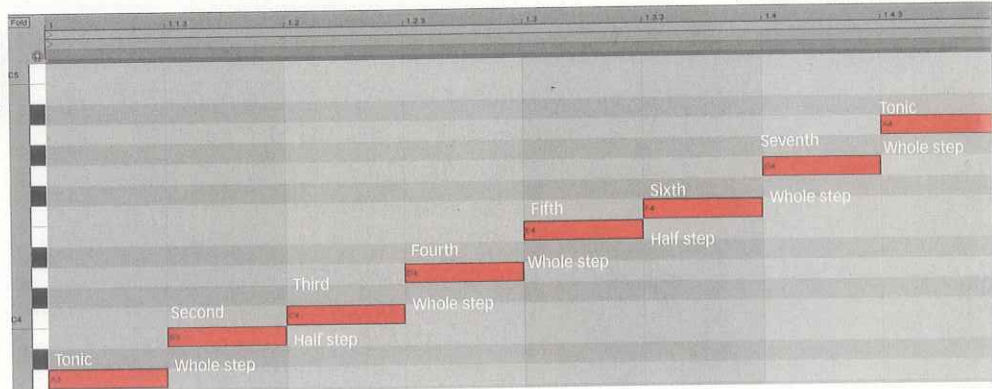


Figure 1. The C major scale shown on a grid. Each horizontal grid line represents a semitone, and you can count them to learn the intervals between each step of the scale.

Figure 2. The A minor scale uses the same notes as C major, but starts on a different note. Notice how intervals between each step change.



notes on the grid, move them around, and immediately hear the results. This allows you to quickly experiment with different keys and scales. So, how do you apply music theory to what's on your screen?

You might start by learning to play the major and minor scales on a piano or keyboard. Begin with C major (C, D, E, F, G, A, B) and A minor (A, B, C, D, E, F, G). Neither of these keys contains any sharps or flats. Both use all of the white keys on the keyboard and none of the black ones. When notes fall within a key signature, they are said to be *diatonic*. Notes that fall outside the key signature (in this case, any sharp or flat) are *chromatic*. This lesson focuses on diatonic scales and chords.

Once you have C and A minor down, you can move on to the other major and minor keys. There are 12 of each, and each follows the same rules. The goal here isn't to become a keyboard virtuoso; it's to develop an understanding of how notes in a key relate to one another. Music theory helps us do this by assigning a number to indicate the position of each tone in the scale or chord. This numbering system is useful because it applies to all 24 major and minor keys. Once you know it, you'll have a better understanding of how your music fits together.

The "one" or *tonic*, is the note matching the key signature. So in the key of C, the note C is the tonic. Simple. A diatonic scale has seven steps in all: the second, third, fourth, fifth, sixth, and seventh.

Each tone in the scale is separated by either a whole step or a half-step. All major scales follow the same formula. Therefore,

although the notes in C major (C, D, E, F, G, A, B) and D major (D, E, F \sharp , G, A, B, C \sharp) are different, the distance between each step (or interval) is the same for both scales.

Likewise, all minor scales share the same formula with one another. A minor (A, B, C, D, E, F, G) uses the same intervals as C minor (C, D, E \flat , F, G, A \flat , B \flat)—and every other minor key.

If you don't know how to read music or play an instrument, seeing a list of notes like that may not tell you much. You may not know, for example, that the interval between B and C is a half step, while the distance between C and D is a whole step. But when you look at the notes on a music software grid, you can see all the intervals quite easily. Let's look at Figure 1, which shows the C major scale displayed on the grid. You can count the grid lines to see how many semitones fall in between each note.

Now check out Figure 2, which shows the A minor scale. It's made up of the same notes as C major, but in a different order. By counting the grid lines, you can see how the intervals between the scale steps have changed. For example, in the major scale, the third (E) is four semitones from the tonic. In the minor scale, the third (C) is only *three* semitones from the tonic. Congratulations: You've just learned an important bit of music theory—the difference between a major and minor third.

Once you understand a bit about scales, it's easier to figure out which chords to use with the notes in a melody or bassline. Chords have at least three notes: the root (which gives the chord its name), the third, and the fifth. These basic chords are called *triads*.

Triads come in four types: major, minor, augmented, and diminished. But the most commonly used are major and minor chords. The intervals between the notes in the triad determine what type of chord it is. For a very quick overview of this, see Figure 3, which shows all four chord types with the same root, C. Notice anything? The third in the major and minor chords correspond to the thirds in the major and minor scales. When a chord and melody share the same note(s), there's a pretty good chance they will sound good together.

A good way to study chords is by playing a *chord scale*, which is basically what it sounds like—a scale made up of chords. In the key of C major, try playing triads on all the white keys of the keyboard, starting with the C chord (C, E, G) and moving up the octave. This scale will produce a series of major, minor, and diminished (dim.) chords (Figure 4). Once again, the grid makes it easy to see the intervals making up each chord.

In music theory, Roman numerals are used to show how each chord relates to the key signature. Upper-case numerals represent

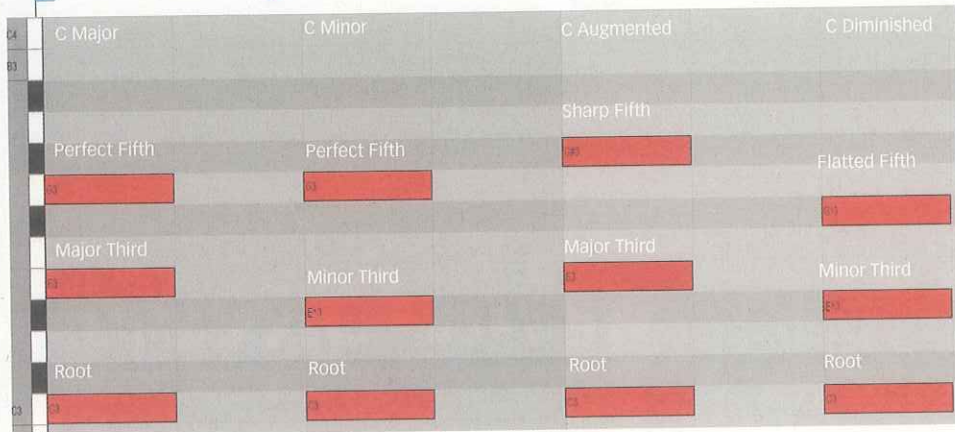


Figure 3: Four triads with C as their root.

major chords; lower-case numerals indicate minor chords. Spelled out this way, a major chord scale is I, ii, iii, IV, V, vi, and vii dim. Therefore, the C major chord scale is C, Dm, Em, F, G, Am and B dim.

You can also play a minor chord scale on the white keys: Am, B dim, C, D, Em, F, G. (i, ii dim, III, IV, v, VI, VII). You can create some amazing tracks using these chords, then add a melody in the key of Am. This may sound basic, but it's a good place to start.

PUSHING DEEPER

One of the coolest things about electronic music is that it gives you fun ways to explore theory. The Ableton Push, for example, has a set of pads that can be used to trigger notes. Users can set the pads to only trigger

notes in a specific scale. This prevents any "wrong" notes, which can be useful as you're learning. In addition to the major and minor keys we've discussed, the pads can trigger variations, or modes, of the scale, as well as many exotic scales.

Other electronic instruments and software apps have the ability to generate harmonies, chords, and *arpeggios* (which are chords played one note at a time), and most let you set them to do so in a specific a key, scale, or mode. When you know a bit of theory, you can make much better use out of these tools.

Once they get started, many musicians discover that music theory is a lifelong pursuit. You're not going to master it in six months. But when you begin to under-

stand a few things about theory, you'll quickly feel more comfortable adding melodies, chords, and chord changes to your songs. You'll learn how to explore more advanced harmonies, add key changes, and much more. Even more important, you'll understand *why* various ideas seem to sound better than others. Theory can serve as a guide for your further understanding of music, but you don't have to obey it like a rule book.

I see electronic music as today's classical music. It's where many of the world's best composers are working. The history of classical music and jazz is the story of people pushing the limits of theory and coming up with new ideas about harmony and sound to develop music theory as we know it today. It's by learning the rules that you can learn how to break them effectively. **T**

Michael Maricle is a composer and performer with over ten albums to his credit. He's a company musician at the University of Washington Department of Dance and instructor of music theory at Warp Academy, an online school of electronic music for Ableton Live users. Watch him do a video lesson with Push at InTuneMonthly.com/inside.

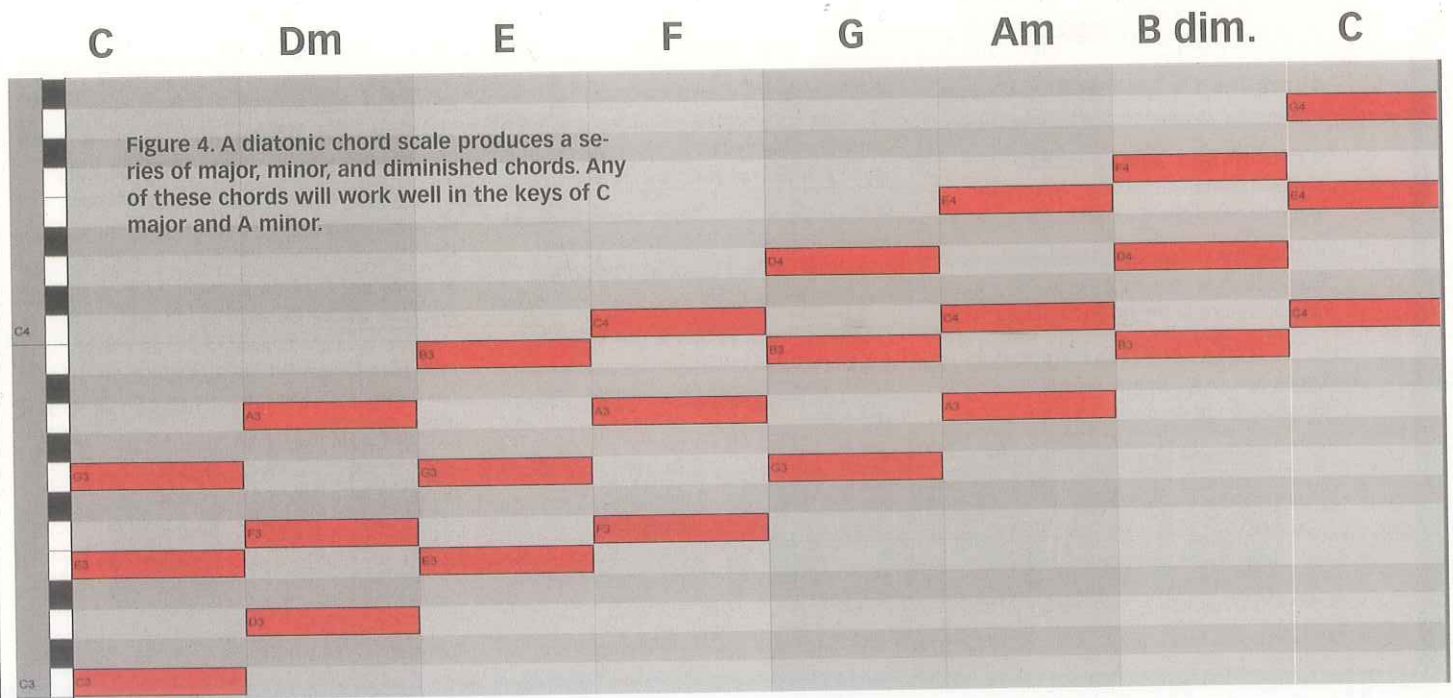


Figure 4. A diatonic chord scale produces a series of major, minor, and diminished chords. Any of these chords will work well in the keys of C major and A minor.