



A BASS PLAYER'S GUIDE TO
ELECTRONIC MUSIC

John Davis **VOLUME 2**

COURSE BOOK

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Introduction

If you've ever sat down with a row of effects pedals and tried to replicate the tone of a classic synth bass line, you'll know that it's harder than you'd think. There are so many variables that it's easy to get lost among all the signal-shaping options. But don't despair; in this course John Davis shares some of the secrets behind the coolest low-end synth sounds out there, and how you can replicate them using just a handful of pedals and a bass guitar.

Meet John Davis



Born in Newport, Rhode Island, John Davis is a master of synth-bass tones and electronic music. A multi-faceted bassist with Jojo Mayer's Nerve, John has developed an extraordinary facility to emulate almost any sequenced synth bassline from his bass guitar and pedalboard in real time.

When he's not touring with Nerve, John can be found behind the mixing desk at Bunker Studios, a recording studio in Brooklyn that he also co-owns. His credits as a mixing engineer include Brad Mehldau's 'Finding Gabriel' (2019 Grammy Winner for Best Jazz Instrumental Album), John Patitucci's 'Soul Of The Bass' and 'The Sound of Listening' by Mark Guiliana.

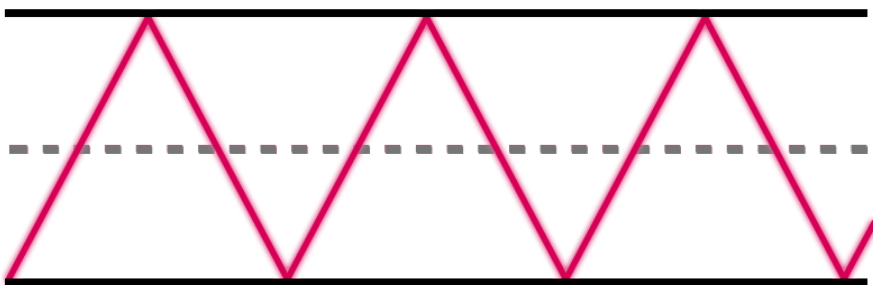
Lesson 01

The building blocks of analog subtractive synthesis

Throughout this course, we're going to be referencing a Korg MS-20 analog synthesizer to understand more about synthesis and signal-flow. The MS-20 is fairly intuitive to operate. Let's take a look at some of the different waveforms that are available.

Triangle Wave

Similar to the tone from a Boss OC-2 octave pedal, triangle waveforms are often used to create smoother and less synthetic bass sounds.

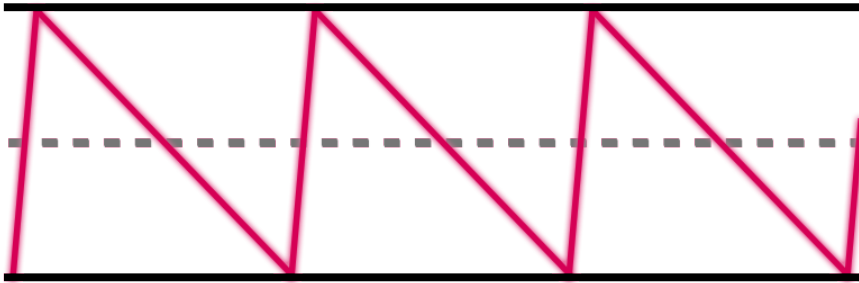


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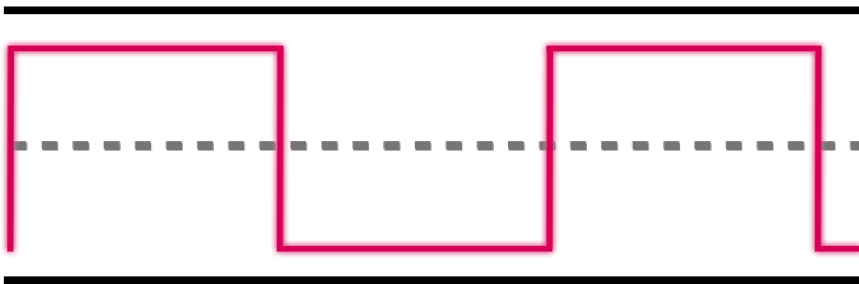
Sawtooth Wave

Sawtooth waveforms are softer and smoother than most other waveforms. They're also harmonically rich, which makes emulating the sound with a bass guitar particularly challenging.



Square Wave

Square waveforms feature a hard cut from the lowest frequency to the highest. The majority of bass synths use a mix of sawtooth and square waves.



Filters

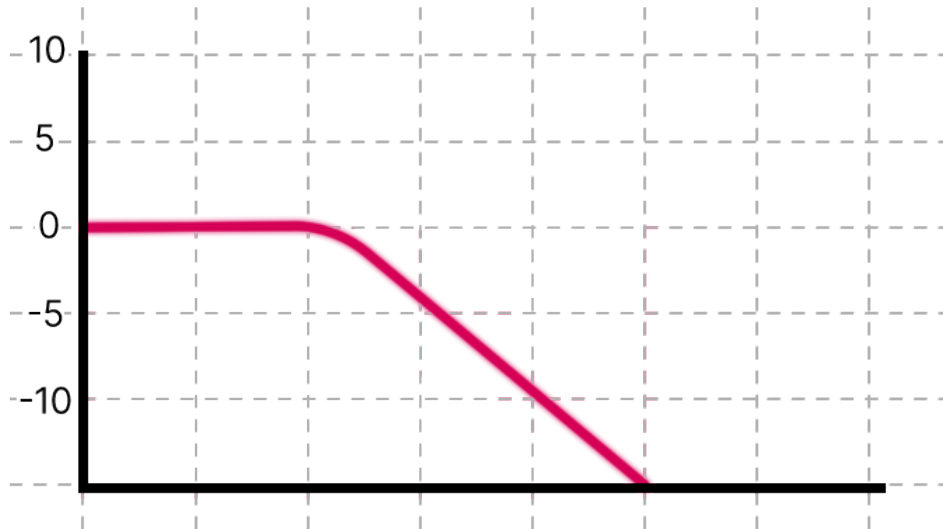
The MS-20 has both a high-pass and a low-pass filter. Internally, these filters are nearly identical, differing only in where the signal is fed to the filter.

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LESSON 1 (Filters continued)

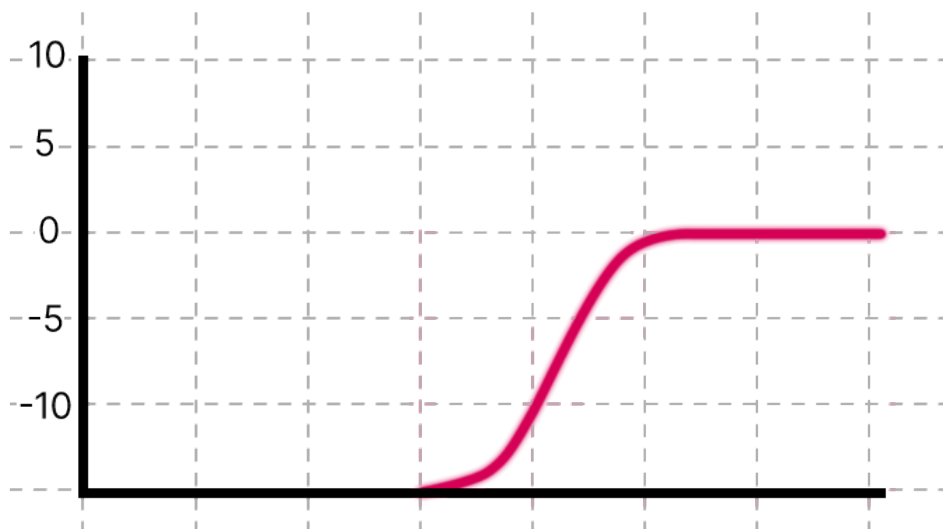
Low-Pass Filter

The low-pass filter removes frequencies above the cutoff frequency; much like the tone control on your bass guitar.



High-Pass Filter

A high-pass filter does the opposite; cutting bass frequencies below the cutoff point to thin the tone.



continued →

LESSON 1 (Filters continued)

Band-Pass Filter

A band-pass filter is a combination of the two; cutting frequencies both above and below the center frequency at which it is set.



Envelope Generator

Often used to control volume, envelope generators give you control over how fast the volume rises and how long it takes for the sound to fade out after a key is released on the MS-20.

Low-Frequency Oscillator

Another source of modulation is an LFO or low-frequency oscillator. On the Korg MS-20 it's referred to as a modulation generator. Low-frequency oscillators operate at low speeds, which means they can be used to automatically wobble pitch, filter cutoff/resonance and lots more. The possibilities are almost endless.

Lesson 02

Waveforms and the perfect pedal setup

Like anything in music, getting the right kind of sub rattling bass sound is a matter of taste. Though no strict rules exist, there are specific pedals and effects that are often used for a reason - they sound great. In this lesson, let's take a look at a few common approaches.

Triangle Wave

Besides learning the technical aspects of what each of these pedals are doing, your ability to hear the different features is critical. We can emulate a triangle wave using a Boss OC-2 with Oct 1 turned all the way up and Oct 2 rolled completely off.

Sawtooth Wave

Sawtooth waveforms are rich in harmonics, which makes them difficult to emulate with a bass guitar. There are some digital synth pedals that can get close. Check out the Pigtronix Space Rip, the Boss SYB-5, the Keeley Synth 1 or the Source Audio C4.

Square Wave

With a solid low-end and a lot of harmonic information, square waveforms offer the best of both triangle and sawtooth sounds. By using a Z.Vex Wooly Mammoth to distort the triangle waveform of the Boss OC-2, you can get a lot closer to the square wave oscillator sound of the Korg MS-20.



Boss OC-2



Source Audio C4



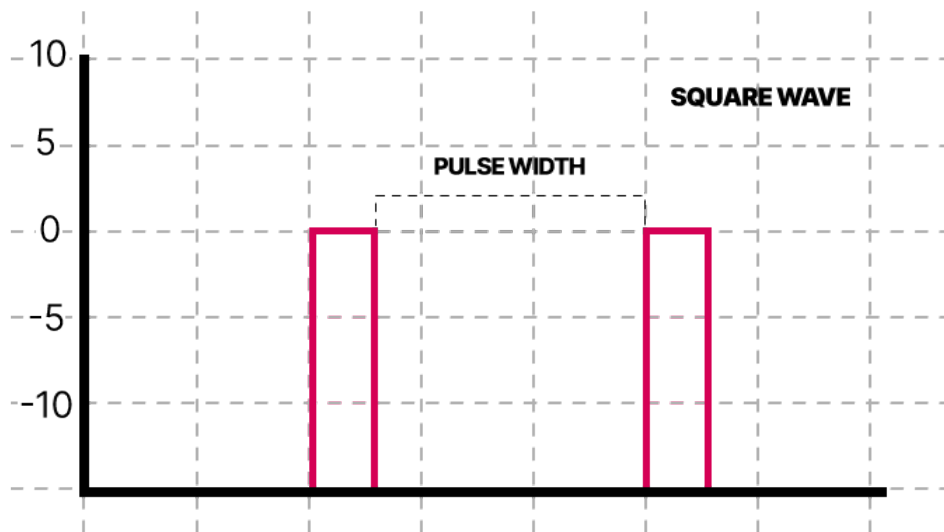
Pigtronix Space Rip

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LESSON 2 (continued)

Pulse Width Modulation

A pulse wave is essentially a square wave with an adjustable amount of time in between each cycle. As the pulse width of the wave lengthens and shortens it creates a phasing effect. The Z.Vex Wooly Mammoth has a control called 'pinch' that does essentially the same thing.



Z.Vex Wooly Mammoth



Keeley Synth 1

Lesson 03

Using an expression pedal to simulate analog synth tones

In this lesson we're looking at the filter section of our synth. As we know, the Korg MS-20 has two filters; a high-pass filter that cuts out low frequencies, and a low-pass filter that cuts out high frequencies. Both of those filter sweeps use a square wave as the basic sound from the oscillator, which John recreates using a Boss OC-2 and a Z.Vex Woolly Mammoth. John's setup also centers around a pair of Eurorack modular synthesizer filters and a Source Audio expression pedal, which he uses to sweep the cutoff frequency using his foot.

"Using the two filter modules and an expression pedal, I'm able to sweep the filter in the same way I would manually," says John. "By controlling the cutoff of the filter with my foot, I'm also free to improvise and play the bass however I want. This way, I can emulate some of the sounds we've explored on the MS-20, like having the envelope generator or the LFO modulate the frequency of the filter."

Lesson 04

Applying synth-style modulation to a live performance

In our final lesson we're going to look at injecting some analog synth-style modulation into your live performances. "Once you've got a good pedalboard setup, one of the easiest things to do is experiment with slow filter sweeps," says John. "Try opening up the filter with an expression pedal and then closing it down again at the end of the 4th bar. This is a classic producer move in electronic music, and a great way to build excitement and anticipation in a live environment."

Video - 01:04

The image displays musical notation for a bass line in 4/4 time, written in a key with three flats (B-flat, E-flat, A-flat). The notation consists of a single staff with a double bar line and repeat dots at the end. The notes are: a dotted half note (B-flat), a quarter note (E-flat), a dotted half note (A-flat), a quarter note (D-flat), a dotted half note (G-flat), and a quarter note (F-flat). Below the staff is a fretboard diagram for a 6-string bass. The strings are labeled T (Top), A, B, and the bottom two strings are unlabeled. The fret numbers for each string are: T (1), A (4), B (1), and the bottom two strings (3, 1, 3).

Course Summary

Getting a synthesizer-like tone from a bass guitar is an incredibly broad and flexible discipline. There are many different schools of thought, which we encourage you to explore as you learn more about electronic music. To get started, the solution can be as simple as grabbing an octave pedal, a fuzz and an envelope filter. Remember that of the main analog waveforms, a square wave is a great place to start. A triangle wave can work too, but it can sometimes be a bit too thin for what we're looking to do.

Many synths also offer pulse width modulation as a way of adding some depth to the waveform, which you can replicate with pedals like the Z.Vex Woolly Mammoth. Incorporate an expression pedal, and you have the freedom to start adding even more subtleties that can only come from nuances in your playing technique. Don't be scared to try out different configurations of effects. Ultimately, the best thing to do is experiment.

In the next installment, we're going to take some of these multi-pedal solutions even further.

