

Digits v1.3

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- Although Digits is free, it may **not** be freely redistributed and the binary of the program may not be altered. Please link to the installer found at <http://www.extentofthejam.com>
- If you have any questions, please feel free to drop me an e-mail!

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Summary

Digits is a Phase Distortion synthesizer. This form of waveshaping synthesis has its roots in Casio's brilliant CZ line of digital synthesizers from the 80s. It is designed to have the warmth of a subtractive (analog) synthesizer, yet be capable of the squelchy tones and sharp attacks of an FM synth. Digits in particular can create warm pads, glitchy sounds, dirty basses, filthy sweeps, screaming leads, and anything in-between.

For those familiar with Moog-like subtractive synthesis, think of the "shaper" as being synonymous with "brightness" or "filter cutoff".

Setting up Digits

Mac OS X:

- Run the setup package. This will install the VST into the default path (/Library/Audio/Plug-Ins/VST)
- The presets and manual can be found in /Applications/Digits
- You may have to enable VST support in your VST host. For instructions on how to do this, please consult your host's manual.

Windows:

- Run the setup program. By default, this will install the manual and presets into Program Files\Extent of the Jam\Digits. If on a 64-bit system, look under "Program Files (x86)".
- The setup program will attempt to detect your VST directory. If it can't find it, it will by default install the VST DLL next to the manual and presets.
- You may have to enable VST support in your VST host. For instructions on how to do this, please consult your host's manual. Be sure to point it to the correct directory if needed.

Linux:

- Extract the tarball
- Navigate to where the contents are and run install-digits.sh. This will put the manual into /usr/share/doc/digits, the presets into /usr/share/digits/presets, and the VST .so file into the place specified by SVST_PATH. If SVST_PATH is not set, it will put the .so file into /usr/share/digits

What's New?

...In Version 1.3:

- Full editor GUI!
- Much lower CPU usage
- New global gain setting
- **Gain defaults to -3db if not set**
(e.g., all old patches/projects default to -3db,
so you may need to adjust gain on old projects)
- Better bank/patch support
- New patch directory layout

...in Version 1.2:

- Fixed memory leak on instantiation
- Better FruityLoops support
- Added "fade" option to sustain stage of envelopes
- More and better presets
- LFO->pitch modulation with noise is improved

...in Version 1.1:

- First Windows and Linux releases!
- Smoothed zipper noise for FM amount automation
- Delayed LFOs are smoother when they kick in
- Fixed dropped notes with extremely low latencies
- Fixed slow instantiation bug
- Improved MIDI handling

User Interface and Patch Saving

While the user interface is described in detail below, you should first know a few things about patch saving. Digits uses standard FXP files to save its patches so that they can be easily shared between programs. However, if you want these to be accessible from within the Digits GUI, these files **must** be placed into /Applications/Digits/Presets/<BANK_NAME>/ on Mac (where <BANK_NAME> is the name of your bank). When you use the save dialog from within Digits, it will default to the **User** bank. You may freely create any number of additional banks off of the **Presets** directory (adjacent to the existing banks).

The bank/patch controls are located in the center bottom of the GUI. The top row is the bank while the second row is the currently selected patch. Click either to pull down a menu of banks or patches. To **save** a patch, click the item labeled "<save patch>" in the patch menu (it's always the last item).

For instructions on what each parameter does and tips on how to use them, read on!

Parameters

Skew/Shaper Mod (ShpMod)

Instead of a waveform selector for each oscillator, the oscillators have these two parameters. The shaper mod determines how many times the waveshaper runs per cycle. The lowest setting is square (twice per cycle), then saw, and then FM-like tones.

The skew slider can make subtle variations in the tone. At 0% or 100% are its cleanest sounds. In-between settings can either add a little bit of hair (overtones) to the sound or morph between the tones, depending on the mod setting.

Here are some common waveshapes and their settings to get you started:

Saw: Skew=0, Mod=Saw

Sine-Pulse: Skew=100%, Mod=Saw (thin, highpass-like sound as shaper increases)

Square Approximation: Skew=0, Mod=Square

Clean Square: Skew=100%, Mod=Square

And here is an example of the funkier, more FM-like waveshapes you can make:

Sine with Dip: Skew=0, Mod=Angrier

Sine: 1 cycle fast followed by 1 cycle slow: Skew=0, Mod=Angrier

Mix

This is the balance between oscillators 1 and 2.

ResoVol

The volume of the resonance generator.

ResoWave

Style of the resonance generator:

Saw Quarter: Saw-like resonance, little high end, buzzy, squelchy

Saw Half: Saw-like resonance with strong fundamental boost, smooth. Good for adding punch to basses.

Square Quarter: Square-like resonance, little high end, buzzy, squelchy

Saw Half: Square-like resonance with strong fundamental boost, smooth. Good for basses and strange, dreamy, bell-like pad sounds

Amplitude and Shaper Envelopes

The envelopes in Digits work a little differently than in most plug-ins. In an effort to fit the most flexibility into the least amount of space, they are modeled after trapezoidal envelope generators:

1. When a key is hit, the envelope rises from zero to its maximum at the rate specified by the attack (**AmpAtt** and **ShpAtt** for the amplitude and waveshaper respectively). This is the attack phase, shown here in yellow.
2. Once the envelope hits its maximum, it goes into the sustain/fade phase, shown here in blue. If sustain is on all the way, the amplitude stays at the maximum as long as the note is held (**AmpSus** and **ShpSus**). If sustain is between 0 and 1, the amplitude will slowly fade at the rate specified. Lastly, if sustain is 0, this phase is skipped entirely and it transitions immediately into the decay phase. This feature is intended to add more life to sustained sounds in the absence of a full ADSR or graphical envelope and is especially useful for the amplitude envelope.
3. When a key is released, the decay phase is triggered, shown in green. During this phase, the envelope decays back to zero at the rate specified. If sustain is on, this happens when the key is released. If sustain is off, this happens either when the key is released or immediately after the attack (**AmpDec** and **ShpDec**).

FM

If FM is on, oscillator 1 is the modulator which feeds into oscillator 2's carrier signal. This slider controls the amount.

Detune

The amount that oscillator 1 and 2 are detuned from each other

Coarse

Coarse detune (octave) for oscillator 1

Gain

The loudness of the sound. The default is -3db, but the control ranges from 0db (maximum loudness) all the way down to -infinity!

BasisWav

The phase of the waveform used in shaping. The default, Cosine, gives the most predictable results. Sine is good for tones with a high-pass characteristic.

PulseWidth

The initial pulse-width of the tone.

VelShape

The amount that velocity affects the brightness of the tone (the shaper amount).

VelVolume

The amount that velocity affects the volume of the tone

LFORate

How fast the LFO goes. The LFO will go from low settings (for tremolo/vibrato) all the way into the audible frequency range (for special effects, noise generation, atonal sounds). To generate noise, set the LFO to 'noise' type and modulate the frequency. All of the parameters except for pulse-width will happily go into the audible range.

LFOType

The shape of the LFO. This can be either sine or noise

LFOShp/LFOAmp/LFOFreq/LFOPWM

How much the LFO affects the shaper, amplitude, frequency, or pulse width

Unison (Phat)

When unison is enabled, several copies of the tone are generated when a key is pressed. These are all detuned from each other. This is good when you need a fat sound.

Del-L/Del-R

Digits has a pair of simple delay effects built-in, one for the left speaker and one for the right. These parameters control how long the delay is.

DelWet

This slider controls how much of the delayed signal is present. When it is set to zero, there is no delay effect on the sound.

DelFB

The delay feedback amount controls how much of the delayed signal is fed back into the delay lines.

DelLoss

Digits' delay line also can model high frequency loss. This controls the rate at which high frequencies fall off as they're cycled back into the delay line.

And Now...

Thanks for showing an interest in my software. I hope you enjoy using Digits as much as I enjoyed writing it!

--Louis Gorenfeld / Extent of the Jam