



basic 65 was developed by **de la Mancha** and **Sink**

It is an 8-bit synth plug-in in VST format for Microsoft Windows based hosts.



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introduction

basic 65 is a monophonic synth, inspired by the classic 80s home computer, the Commodore 64 and its legendary SID chip. Building on the waveforms and signal path of this famous chip, basic 65 adds further features and options to take things a step further. The double arpeggiator allows complex versions of that retro 8-bit game sound and the modulation options inspire experimentation via the mod envelope and 2 comprehensive LFOs. Pulse width modulation, ring modulation and oscillator detune/sync are key ingredients in the signature sound. Throw in some pitch drift, bit drift, a sprinkle of dirt and randomisation and you have a wide range of lofi, chiptune, retro-tastic sounds at your disposal.

This version is the update to the popular basic 64, redesigned from scratch, with many improvements, new features and all new presets.

features

- Monophonic synth in VST format for Windows based hosts
- 3 oscillators with pulse, saw, triangle and noise waveforms
- Pulse width can be modulated by envelope or both LFOs
- Each oscillator can be sync'd to another and/or ring modulated by another
- Each oscillator has its own ADSR envelope and can be routed to filter individually
- Resonant filter with low pass, high pass, band pass and notch modes
- 2 tempo-sync Arpeggiators in series for complex arp sounds
- Arp tempo, range and note length can be adjusted
- Modulation envelope can control pulse width and pitch of individual oscillators as well as filter and dirt
- 2 tempo-sync LFOs with wide range of waveforms, including random
- Both LFOs can control pulse width and pitch of individual oscillators
- One LFO also controls filter and dirt, the other can modulate the depth and speed of the first LFO
- Envelopes are non-linear and can be retriggered from zero or smoothed on each new note
- Pitch drift models instability with variable depth and frequency
- Options for 4, 6, 8, 12 or 16 bit audio with randomising feature
- Developed with SE 1.1, so no problems with multiple instances
- 128 presets covering arps, bass, lead, drums and lofi sounds
- basic 64 is also included in the download

installation

Installation is simple, just extract *basic65.dll* from the zip file and copy it into your VST directory. Install and load in your host program as you would any other VST instrument.

As *basic65* will auto-install some module files into a sub-directory with the dll, you need to make sure that Windows folder permission rights for your VST directory allows this, especially in Vista / 7 where it may default to block this process

To uninstall, simply delete the *basic65.dll* file and the associated *basic65* folder from your VST directory

controls

GENERAL

All knobs are rotated by clicking and dragging vertically. Upwards rotates clockwise and downwards rotates anti-clockwise. The value is displayed below the knob and can also be typed in manually by clicking on the value once.

Note: You can type in values outside of the normal knob range if you wish, for added flexibility. However, please be careful, as this can result in high levels that can be dangerous to your ears or equipment. It is suggested to use a clipper or a limiter plugin as protection

Bi-polar knobs (eg detune) that have both positive and negative values, can be reset to zero by double clicking on the knob.

All toggles have 2 positions, on or off (yellow when ON).

Global controls



Bit depth – use the drop down to select from a range of bit depths (4bit to 16bit). The lower the number, the more lofi the sound.

Bit random – when this is on (yellow) then the bit depth is randomised in tempo-sync with the host bpm. Adds an unpredictable dimension to the sound.

Monophony mode – There are 2 different monophonic modes in basic 65

- *Monophonic* is classic single note behaviour. You can only play one note at a time, each new note cuts the old one, even if the old one is held down. If you release the new note first, then it goes back to playing the old note again.
- *Mono drop* is the same except that once a new note is hit, the old note is dropped for good and will not play again when the new note is released. This is useful for kick drums for example.

octave – Sets the global pitch. From the drop down box you can select from -5 to +5 octaves transposed from the midi note that is played. Select 'on pitch' if you do not want to change the pitch from the played note.

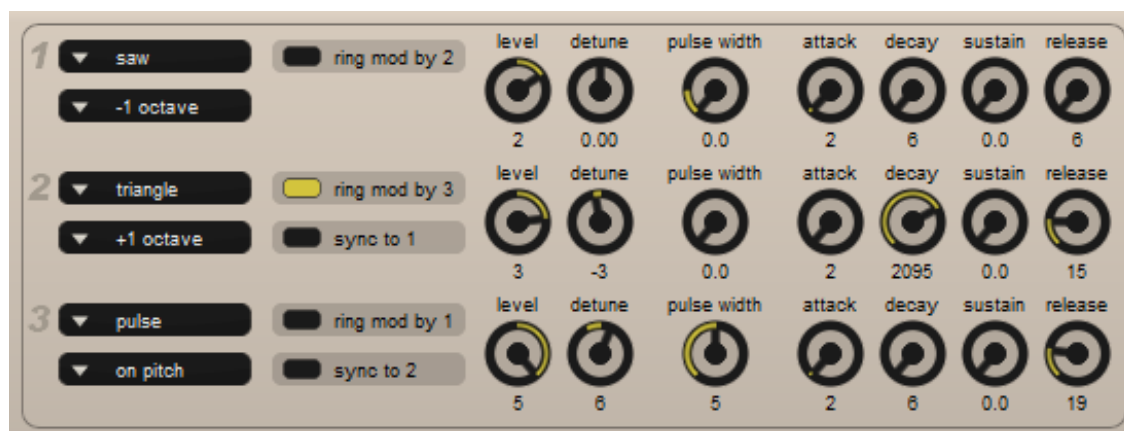
dirt – this control adds some extra harmonics and saturation. Character building stuff!

porta - sets the portamento time on an arbitrary scale of 0-10. Portamento is the gliding of pitch from one overlapping note to another. It can give nice pitch bends between overlapping notes

master level – Too loud? Turn it down. Neighbours annoying? Turn it up!!!

Oscillators

basic 65 has 3 oscillators, each with 4 waveforms and its own ADSR envelope



waveform – from the drop down selector, you can choose;

- pulse
- saw
- triangle
- noise

octave – from the drop down box you can select from -5 to +5 octaves transposed from the midi note that is played. Select 'on pitch' if you do not want to change the pitch from the played note.

ring mod by X – When this is on, the oscillator is ring modulated by the output of another oscillator. Ring modulation multiplies the signals together and often produces a metallic or lo-fi effect.

sync to X – when on, this causes the oscillator to restart a new waveform in sync with oscillator X. This has most impact when the sync'd oscillator is detuned from the oscillator it is sync'd to, especially when the pitch is modulated.

level – this is the relative volume level of the oscillator

detune – the pitch of the oscillator can be detuned by +/- 36 semitones. Double-click to reset to zero

pulse width – This feature is only active when the pulse waveform is selected, otherwise it has no effect.

This knob changes the width of the pulse, which in turn changes the sound.

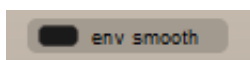
- 0 = square wave (pulse is 50% of wavelength)
- 2 = pulse wave (pulse is 40% of wavelength)
- 5 = pulse wave (pulse is 25% of wavelength)
- 8 = pulse wave (pulse is 10% of wavelength)

ADSR Envelope

These 4 knobs control the non-linear ADSR (attack, decay, sustain, release) envelope profile.

attack, decay and release are all in ms (milliseconds)

sustain is the volume level of the sustain section, from 0 to 10



The release-attack behaviour can be smoothed by switching on the 'env smooth' button to the right of the oscillator section. When on, the attack does not start from zero, but from the last point on the release curve. This helps to declick, but may also deaden the attack, so shouldn't be used in plucked or percussive sounds, but is useful for pad or sub-bass sounds for example.

Filter



The filter is a multi-mode filter with adjustable cut-off and resonance. Each oscillator can be routed to the filter, or bypassed individually.

Mode – use the drop down to select from Low Pass, High Pass, Band Pass or Notch

Routing – use the 1/2/3 selectors to route each oscillator individually to the filter. When highlighted yellow, that oscillator will be processed by the filter. When dark grey, it bypasses the filter. In the image, oscillators 1 and 2 are routed through the filter and oscillator 3 bypasses it.

cut-off – This sets the filter cut-off in kHz from 0 to 22 kHz.

res – this knob sets the filter resonance, the higher the number, the more nasty resonance.

Modulation Envelope



The modulation envelope is a way to modulate pitch, pulse width, filter and dirt for each new note. It can be switched on or off using the MOD ENV toggle.

ADSR Envelope

These 4 knobs control the non-linear ADSR (attack, decay, sustain, release) envelope profile.

attack, decay and release are all in ms (milliseconds)

sustain is the modulation level of the sustain section, from 0 to 10

The release-attack behaviour can be smoothed by switching on the 'smooth' button to the left of the panel. When on, the attack does not start from zero, but from the last point on the release curve. This helps to declick, but may also deaden the attack.

Modulated parameters

Negative values mean the parameter will be modulated by subtracting the value when sustain is at 10

Positive values mean the parameter will be modulated by adding the value when sustain is at 10

Zero means the parameter will not be modulated.

You can double-click any of the five parameter knobs to reset them to zero.

detune (+/- 36 semitones) – modulates the oscillator pitch, each oscillator can be selected or deselected individually

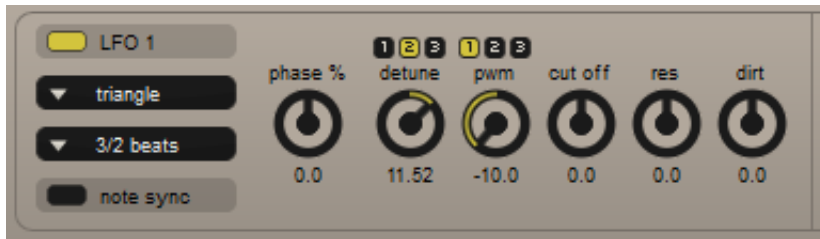
pwm (+/- 10) – modulates the pulse width, each oscillator can be selected or deselected individually

cut-off (+/- 22kHz) – modulates the filter cut-off

res (+/- 7) – modulates the filter resonance

dirt (+/- 10) – modulates the global dirt parameter

LFOs (Low Frequency Oscillators)



There are 2 LFOs which modulate various parameters in tempo-sync with the host, according to the LFO waveform selected and the parameter values. LFO 2 can also modulate LFO 1.

LFO 1 – LFO can be switched on (yellow) or off to save CPU

Waveform – use the drop down menu to choose from 20 different waveforms for the LFO. The waveforms include standard shapes (such as sine, triangle, saw etc) as well as variations on these (ripsaw, sawrip) as well as some unusual shapes (dip, hump, peak) and two random (random & rnd glide)

Frequency – the LFO frequency is expressed in beats, which is tempo-synced with the host bpm. Use the drop down to select the frequency from 1/32 beats (ultra-fast) to 32 beats (ultra-slow). There are also some odd frequencies (3/2 beats, 1/3 beat).

Note sync – toggle this on to restart the LFO waveform each time a new note is pressed. This is useful if you want the same sound on each note press but not if you want a regular modulation regardless of new notes

Phase % - Here you can adjust the phase of the LFO waveform, useful to stagger the phases of LFO1 & LFO2. +50% means 180 degrees out of phase, -25% means -90 degrees out of phase

Note: When *pulse* or *rnd glide* waveforms are chosen, the phase knob changes function

Pulse – knob adjusts the waveform pulse width

Rnd glide – knob adjusts how smoothly the LFO transitions from one value to the next. (glide values over 90% are so smooth that nothing happens, so not really advised)

Modulated parameters

Negative values mean the parameter will be modulated 180 degrees out of phase with positive values (ie when one is rising, the other will be falling)

Zero means the parameter will not be modulated.

You can double-click any of the five parameter knobs to reset them to zero.

detune (+/- 36 semitones) – modulates the oscillator pitch, each oscillator can be selected or deselected individually

pwm (+/- 10) – modulates the pulse width, each oscillator can be selected or deselected individually

cut-off (+/- 22kHz) – modulates the filter cut-off

res (+/- 7) – modulates the filter resonance

dirt (+/- 10) – modulates the global dirt parameter

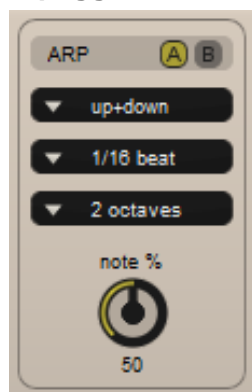


LFO 2 is as per LFO 1 but swaps the **res** and **dirt** parameters for two controls that modulate LFO 1

LFO1 amp – modulates the global amplitude (depth) of LFO1 from 0 to 100% variance from full depth (a value of 30 will modulate LFO1 depth from 70-100%)

LFO1 freq – modulates the speed of LFO1, even if it is in tempo-sync mode, from x1 to x16. A value of 8 means LFO1 freq will be modulated from default speed to 8x speed

Arpeggiator



There are 2 tempo-sync ARPs, A & B, that are identical in controls and work in series.

A / B – select A or B to modify the controls for that Arp

Arp mode – use the drop down to select the arp mode (up, down, up+down etc) or select -off- if not needed.

Arp frequency – use the drop down menu to select the arp frequency, expressed in beats (4 beats to 1/64 beats) in tempo-sync with the host bpm.

Arp range – use the drop down to select the octave range you want to arp over, from 1 to 4 octaves. Selecting 1 octave means that the note will not change but it will repeat at the chosen frequency. Good for rapid note repeats and kick drum machine gunning.

note % - this defines the length of the arp note as a percentage of the gap between notes from 0-100%. For example, if the arp is set to 1/4 beat frequency, then a note length of 50% will be an 1/8 beat. Each note will be 1/8 beat followed by a gap of 1/8 beat. Reduce the note % to 25% and you get a note length of 1/16 beat, followed by 3/16 beat gap.

Note that all envelopes still apply to the arp notes, so that long attack times might mean the note is not heard, or long release times mean that gaps between notes are not obvious.

Pitch drift



As well as pitch being modulated by the modulation envelope and the LFOs, there is also a pitch drift function that randomly modulates the pitch to give an unpredictably detuning effect.

pitch drift – switch on (yellow) to enable pitch drift

Amount knob – this controls the depth of the pitch drift, turn it right for a more obvious detune, keep left for subtle.

Drift mode – use the drop down menu to select the drift mode, buzz is rapid modulation, drift is slow and unstable is in-between.

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credits

Thanks to **Jeff McClintock** for creating SynthEdit and to the 3rd party SE module developers, without which this plug-in wouldn't exist.

Also a big thanks to **g200gk** for the fantastic **knobman** programme used to create the animated knobs

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Links	
SynthEdit	http://www.synthedit.com/
Dave Haupt Modules	http://www.dehaupt.com/SynthEdit/semodules.htm
Chris Kerry Modules	http://www.chriskerry.f9.co.uk/
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Scoofster Audio	http://scp.web.elte.hu/synthedit/modules.html
Knobman	http://www.g200kg.com/en/software/knobman.html

about the developers

de la Mancha lives, eats, dreams and breathes VST plugins, seeking to bring randomization and modulation to the masses. He is also a producer of odd-skool breakbeat, downtempo glitchy beats and other assorted bleeps and noises. You can find his music at www.papadodo.co.uk www.3x0.co.uk and www.mono-log.co.uk

Sign up for the newsletter if you want to be kept in touch about plug-in releases and updates:

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Sink is a french-based electronic music producer. He creates electronica, melting IDM/Breakz/Ambient/Chiptune/Dubstep/Electro and many playful bleeps, and enjoys gathering rusty vintage analogue hardware sounds and tweaks with digital processes. He also makes electronic percussive samples as Wavesaper - <http://wavesaper.12r.org/>. Find more about him here www.sinkmusic.com and there www.myspace.com/sinkmusic