

**Addendum**  
**Virus TI OS Revision 2.0**

## VIRUS TIOS 2.0 ADDENDUM

Thanks for installing our latest Virus TI operating system.

TIOS 2.0 is a combined feature and maintenance release. The installer package will update your Virus TI hardware, drivers, Virus Control plug-ins and documentation.

The new version features additional oscillator types, enhanced Wavetable synthesis and more wavetables. It allows you to see how *expensive* a chosen patch is and features Section Locking through Virus Control. Patches can be finally sorted by category and the onboard patch ROM contains addition 256 sounds by Matthew Stolley and Matt Picone.

## NEW OSCILLATOR MODES

We have included new oscillator modes, greatly expanding on the flexibility of these already powerful sound-sculpting tools.

### Oscillator Mode

To find the new modes, simply use the Osc Mode parameter. The available modes are: Classic (VA), HyperSaw, Wavetable,

WavePWM, Grain Simple, Grain Complex, Formant Simple and Formant Complex.

## Grain Table Synthesis

The remaining oscillator modes all make use of a new technology for the Virus TI, called *Grain Table*. The basic idea behind this technology, is to take the existing wavetables, and apply similar techniques as those used in some granular sampling and pitch-shifting algorithms to open up a whole new world of possibilities. Each of the two main types: *Grain Table* and *Formant Table* are presented in both *Simple* and *Complex* formats. In each case, the *Simple* mode offers fewer parameters, and a higher polyphony than *Complex*, with the values of parameters common to each mode remaining constant.

It's important to note that the characteristics of the Grain Table and Formant Table oscillators are quite different to those of traditional "granular" sampling/synthesis techniques, which tend to be associated with other-worldly "clouds" of sound. In the Virus TI, we have instead employed the technology to achieve a very musical result which should prove every bit as useful as the other oscillator types in all manner of musical projects.

## Simple Grain Table Oscillator

### Index

Determines the playback position within the currently selected Wavetable. Each of the 128 available values represents either a particular wave or the interpolation of the two nearest waves. Modulating the Index of a wavetable with an LFO or Envelope will often result in a highly-dynamic variation in the timbre of a sound, impossible via any other means.

This parameter can be modulated via the Mod Matrix and the LFO's – please select 'Wavetable 1/2 Index' from the list of available destinations

*Please note that Table 0 (Sine) contains only a sine wave, and as such, the Index parameter will have no effect on it.*

### Wavetable

Selects the current Wavetable – each being a unique collection of different waves from which all manner of different timbres may be achieved.

## Formant Shift

Use this parameter to sweep the pitch of the formants in the wavetable by +/- 64 semitones. The effect is reminiscent of oscillator sync, and can be useful for both extreme lead sounds (try broad sweeps!), as well as subtle timbral variations.

The movement within a wavetable will still be recognisable as you sweep through the Index points, but you will notice a very different character to the same table as played by the standard Wavetable oscillator.

A useful property of the Simple version is that the fundamental frequency can always be heard, no matter where you set Formant Shift.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Osc1/2 Formant* from the list of available destinations.

**Hint:** *Use the Simple modes where possible if polyphony is a concern – they eat a lot less DSP power than the 'Complex' modes.*

## Interpolation

Use this parameter to determine the how smoothly the different waves in the current Wavetable are blended into each other as the Wavetable Index of the respective oscillator is swept.

## Complex Grain Table Oscillator

Here we have the purest application of the Grain Table technology – and a very powerful oscillator indeed.

### Index

Determines the playback position within the currently selected Wavetable. Each of the 128 available values represents either a particular wave or the interpolation of the two nearest waves. Modulating the Index of a wavetable with an LFO or Envelope will often result in a highly-dynamic variation in the timbre of a sound, impossible via any other means.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Wavetable 1/2 Index* from the list of available destinations.

Please note that Table 0 (Sine) contains only a sine wave, and as such, the Index parameter will have no effect on it.

## Wavetable

Selects the current wavetable – each being a unique collection of different waves from which all manner of different timbres may be achieved.

## Formant Shift

Use this parameter to sweep the pitch of the formants in the wavetable by +/- 64 semitones. The effect is reminiscent of oscillator 'sync', and can be useful for both extreme lead sounds, as well as subtle timbral variations.

At 12 o'clock position, the sound will be identical to that of the standard Wavetable oscillator. As you sweep through the other values you will hear a fascinating shift in the spectra of harmonics, and a very different character to the same wavetable played by the standard Wavetable oscillator.

In contrast to the Simple version, the fundamental frequency is shifted along with the rest of the wave, resulting in a more dramatic effect.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Osc1/2 Formant* from the list of available destinations.

### **Formant Spread**

By adjusting the *spread* of the formants, a very complex effect is achieved – something like an unholy alliance between a sub-oscillator and a sync-sweep could be one way of describing it, although the depth of the effect is highly-dependent on the current value of Formant Shift.

For an effective demonstration, try sweeping from 0 (default) through to 127, with Formant Shift set at 12 o'clock position.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Osc1/2 Spread* from the list of available destinations.

### **Local Detune**

Use this parameter to achieve the effect of two detuned oscillators an octave apart. Note that this parameter is most effective when Formant Spread is set to a relatively low value.

### **Interpolation**

Use this parameter to determine the how smoothly the different waves in the current Wavetable are blended into each other as the Wavetable Index of the respective oscillator is swept.

**Hint:** Use the 'Simple' modes where possible if polyphony is a concern – they eat a lot less DSP power than the 'Complex' modes

### **Simple Formant Table Oscillator**

The Simple Formant Table oscillator is similar in concept to the Simple Grain Table oscillator, only with one crucial difference: the formants remain fixed as you play up and down the keys. This effectively turns the oscillator into a kind of filterbank, comprising up to 256 resonant bandpass filter poles, whereby the cutoff of each pole is determined by the harmonics in the current wavetable index.

### **Index**

Determines the playback position within the currently selected Wavetable. Each of the 128 available values represents either a particular wave or the interpolation of the two nearest waves.

Modulating the Index of a wavetable with an LFO or Envelope will often result in a highly-dynamic variation in the timbre of a sound, impossible via any other means.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Wavetable 1/2 Index* from the list of available destinations

Please note that Table 0 (Sine) contains only a sine wave, and as such, the Index parameter will have no effect on it.

### **Wavetable**

Selects the current Wavetable – each being a unique collection of different waves from which all manner of different timbres may be achieved.

### **Formant Shift**

Use this parameter to sweep the pitch of the formants in the wavetable by +/- 64 semitones. The effect is reminiscent of oscillator 'sync', and can be useful for both extreme lead sounds, as well as subtle timbral variations.

The movement within a wavetable will still be recognisable as you sweep through the Index points, but you will notice a very different character to the same table as played by the standard Wavetable oscillator.

A useful property of the Simple version is that the fundamental frequency can always be heard, no matter where you set Formant Shift.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Osc1/2 Formant* from the list of available destinations.

### **Interpolation**

Use this parameter to determine the how smoothly the different waves in the current Wavetable are blended into each other as the Wavetable Index of the respective oscillator is swept.

**Hint:** *Use the 'Simple' modes where possible if polyphony is a concern – they eat a lot less DSP power than the 'Complex' modes!*

## **Complex Formant Table Oscillator**

Similar to the Simple version, the Complex Formant Table oscillator keeps the formants at a fixed pitch as you play up and down the keys. It also introduces the additional parameters found in the Complex Grain oscillator.

## Index

Determines the playback position within the currently selected Wavetable. Each of the 128 available values represents either a particular wave or the interpolation of the two nearest waves. Modulating the Index of a wavetable with an LFO or Envelope will often result in a highly-dynamic variation in the timbre of a sound, impossible via any other means.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Wavetable 1/2 Index* from the list of available destinations

Please note that Table 0 (Sine) contains only a sine wave, and as such, the Index parameter will have no effect on it.

## Wavetable

Selects the current Wavetable – each being a unique collection of different waves from which all manner of different timbres may be achieved.

## Formant Shift

Use this parameter to sweep the pitch of the formants in the wavetable by +/- 64 semitones. The effect is reminiscent of oscillator 'sync', and can be useful for both extreme lead sounds, as well as subtle timbral variations.

The movement within a wavetable will still be recognisable as you sweep through the Index points, but you will notice a very different character to the same table as played by the standard Wavetable oscillator.

In contrast to the Simple version, the fundamental frequency is shifted along with the rest of the wave, resulting in a more dramatic effect.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Osc1/2 Formant* from the list of available destinations.

## Formant Spread

By adjusting the spread of the formants, a very complex effect is achieved – something like an unholy alliance between a sub-oscillator and a sync-sweep could be one way of describing it, although the depth of the effect is highly-dependent on the current value of Formant Shift.

For an effective demonstration, try sweeping from 0 (default) through to 127, with Formant Shift set at 12 o'clock position!

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Osc1/2 Spread* from the list of available destinations.

### Local Detune

Use this parameter to achieve the effect of two detuned oscillators an octave apart – note that this parameter is most effective when Formant Spread is set to a relatively low value.

### Interpolation

Use this parameter to determine the how smoothly the different waves in the current Wavetable are blended into each other as the Wavetable Index of the respective oscillator is swept.

**Hint:** Use the ‘Simple’ modes where possible if polyphony is a concern – they eat a lot less DSP power than the ‘Complex’ modes!

### Wavetable PWM Oscillator

The WavePWM oscillator takes two instances of the same wavetable, and phase-shifts them against each other to achieve an effect reminiscent of the traditional pulsedwidth modulation of a pulse wave oscillator.

### Index

This determines the playback position within the currently selected Wavetable. Each of the 128 available values represents either a particular wave or the interpolation of the two nearest waves. Modulating the Index of a wavetable with an LFO or Envelope will often result in a highly-dynamic variation in the timbre of a sound, impossible via any other means.

This parameter can be modulated via the Mod Matrix and the LFO’s – please select *Wavetable 1/2 Index* from the list of available destinations

Please note that Table 0 (Sine) contains only a sine wave, and as such, the Index parameter will have no effect on it.

### Wavetable

Selects the current Wavetable – each being a unique collection of different waves from which all manner of different timbres may be achieved.

### PulseWidth

At zero position, all the even-numbered harmonics are cancelled out, creating a hollow sound similar to a 50% pulse wave - when the value reaches 127, the whole wave is almost entirely cancelled out, resulting in a much thinner sound.

This parameter can be modulated via the Mod Matrix and the LFO's – please select *Osc1/2 Pulse Width* from the list of available destinations

### **Detune**

As with traditional PWM, much of the fun comes from modulating the pulsewidth by an LFO, which creates the characteristic warmth of detuned oscillators - the Detune parameter creates this effect automatically, with no further modulation assignments.

### **Interpolation**

Use this parameter to determine the how smoothly the different waves in the current Wavetable are blended into each other as the Wavetable Index of the respective oscillator is swept.

**Hint:** *If you do not make use of either the PulseWidth or Detune parameters, switch back to Wavetable mode to save on DSP and increase polyphony!*

## ENHANCED WAVETABLE SYNTHESIS

### Additional Wavetables

In order to enhance the experience of the additional Wavetable functionality even further, Access have created 27 new wavetables for OS2. Each has been carefully selected to compliment the existing content, and to exploit the characteristics of the new oscillator modes.

They come in several different flavours, including filter-like sweeps, formant morphs, harmonic inter-play, Fibonacci sequences and more.

### Tips for auditioning the Wavetables

As with the majority of the Wavetable content, it is advisable to audition them at relatively low pitch (we suggest setting Oscillator Semitone to -24). This is because the lowest audible frequency (the *fundamental*) in any table is always pitched to middle C3, but in many of the brighter-sounding tables, the fundamental plays little part in the overall timbre, and the upper harmonics (often where all the action is) can be very difficult to perceive at high pitch, or are simply filtered out altogether.

Since there are many differences between the tables in terms of their spectral dynamics, it is a good idea to audition them all in a variety of different ways. Simply sweeping through the Index

by hand is one way, but can give very misleading impressions as to the usefulness of the table. Try first with a slow LFO (triangle wave) and then a fast envelope sweep in both directions to get a better idea of what the table may or may not be good for.

Remember, for those tables with several contrasting waves, subtle modulation is often the key.

Don't forget to try them all with different settings of the new Interpolation parameter.

### Interpolation

Use this parameter to determine the how smoothly the different waves in the current Wavetable are blended into each other as the Wavetable Index of the respective oscillator is swept.

Since the number of waves differs with each Wavetable, the result of this will depend on which table you have selected.

Each Wavetable refers to a selection of different original waves, through which the oscillator can sweep in realtime. At the default (0) setting of Interpolation, each of the 128 positions of the Wavetable Index represent a unique mix of the two nearest waves, resulting in a smooth morphing of the timbre as you sweep the Index position.

With Interpolation at zero position, the waves are blended as smoothly as possible, with the mid-point between each wave representing a 50/50 mix of the two nearest waves. As you increase the value, an increasingly large “dead-zone” is created between each of the original waves, and the blend rate is increased accordingly until, at the maximum value (127), a stepping effect is achieved.

The net result is a very different characteristic from when the waves are blended smoothly, in two very important ways: firstly, that slow LFO modulations of Wavetable Index will generally result in a somewhat rhythmic effect that is difficult to achieve by other means, and secondly, the original waves will be presented much more distinctly, and may often appear much brighter as a result (not that they are, mind – it’s just that pin-pointing the exact value out of 128 possibilities at which a wave is not blended with any other, can be rather tricky!)

Interpolation is also available as a destination in the Mod Matrix . Please select *Osc1/2 Interpolation*.

## SECTION LOCKING

Section locking is a unique and versatile tool to import certain aspects of a patch into another one. It enables Virus Control user to decide which aspect of a given sound is changed when browsing through patches.



Imagine you are working on a song and you just played a melody which works great with the delay pattern of the current patch. Unfortunately, the patch itself doesn't really match the rest. Under normal circumstances you will alter the delay pattern once you start browsing through alternative sounds. With Section Locking though, you can lock the Delay and therefore browse through patches without impacting the great melody you've just played which unfortunately relies on this certain type or Delay.

Imagine you work on an arpeggiator patch and you like the patch but the arpeggiator pattern doesn't work well with the rest of your song. By locking all aspects of the patch apart from the arpeggiator section you can browse through thousands of patches but in difference to how would work normally only the arpeggiator will change.

### How does it work?

Every section in Virus Control has a blue header bar. Double click it and it will turn red. Red means that this section is now locked. To unlock it, simply double click on it again. A tab which contains a locked section shows a red indicator as well as a part which contains a locked section as well. This is important because you can lock sections on a part basis. Once you start dialing up patches every locked section will stay like it is. It doesn't matter if you browse using the hardware or the Virus Control browser.

Depending on what you want to achieve you need to lock all aspects of a patch minus the one you want to change (see the arpeggiator example above) or lock a single aspect (like in the Delay example). To ease this task you can choose more options from a context menu by right clicking on a header bar. The context menu offers to lock all, unlock all, invert the locking status and choose from a couple of presets. Please note that every entry within the context menu will change the selection of the active part and not all parts at the same time.

The Easy, Browser and Common pages don't allow their sections to be locked. Nevertheless you can unlock all section on the browser page by choosing the appropriate menu entry within the context menu (right click).

### Tips and tricks

The possibilities of Section Locking are endless. You can use it to store templates in other patches. Just imagine to store you favorite home grown user arp patterns and use them in any other patch you like. Section Locking can also act similar to a random patch generator. Lock everything minus the Oscillators and dial through patches. The sound will change but the overall esthetics of how the patch react will stay the same because the envelopes, LFOs and effects are the same.

## INACTIVE PARAMETERS

Right from the start, the Virus TI hardware didn't show inactive parameters in order to keep the parameter menus as short as possible. The Virus Control plug-in from now on shows inactive parameter in a semi translucent fashion which will increase your overview dramatically. You will never tweak a parameter without anything happening again (because the entire section was off).

## PATCH COMPLEXITY INDICATOR

The playmode page on the Virus TI hardware contains a new icon which informs you about the complexity of the current patch. The complexity is an indicator of the polyphony at your disposal whilst playing this particular patch. The icon, which looks similar to the battery status icon on your mobile phone, shows between one and five bars where one bar stands for a rather "cheap" sound and five for a pretty "expensive" one.

Please note that the Virus TI allocates it's resources dynamically, and the load a patch creates on the DSPs might change depending on how you play it.

## SEARCH BY CATEGORY

With version 2.0 the Virus Control plug-in allows you to search for specific sounds by filtering for a patch category.



Use the category drop-down menu to select the kind of patch you would like to filter for. Once done you will be presented with

a new virtual bank which contains all patches of this certain category. This powerful feature can be used in conjunction with the Search For Patch Name function and will help you find specific patches in a matter of seconds.

## TWO NEW ROM BANKS

In addition to the 17 ROM banks, OS 2.0 features two new ones by Matt Stolley and Matt Picone. Stolley's "10 Dirty years" bank will probably get us into trouble, either for his tendency of choosing explicit patch names or for the darkness of his latest breaks, electro and d'n'b bank. Assuming that you're 18 years or older we suggest that you point your TI to bank ROM-R but only on mentally-stable days.

Matt Picone's latest submission in contrast is rather bright and a welcome addition to the *players* among us. The new bank features versatile live patches, beautiful ambient beds and arpeggiators. Nevertheless there is a couple of sounds you shouldn't use at a family dinner.

## WHAT'S NEW IN PREVIOUS VERSIONS?

### Mac Intel Support

The Virus Control is now compatible with Intel Processor based Macs.

### Direct monitoring

A new button within the part bar, right underneath the Mute button labelled "D" for Direct Monitoring allows you to switch the output assignment on the fly. The direct monitoring button switches from any output to the analog outs in order to provide the Virus patch you are about to record with a minimum latency signal path. Please note that you need to disable Direct monitoring once you've finished recording. Please also note that when overdubbing with Direct Monitoring enabled, the already recorded notes will play ahead of time for technical reasons.



### VU style level meters

The part bar on the left hand side feature level meters which will give you a much better overview on which part is playing at a certain point in time. The level meters react to incoming MIDI events and therefore might not show the release phase of a patch in an accurate fasion.

### Remote Mode

The Remote Mode turns your TI into an universal remote control for your other instruments. Each template re-programms all knobs on the TI hardware surface in order to remotely control another plug-in or hardware synthesizer. You can program and share your own templates. Details can be found in the Virus Control Tutorial.

## 112 Additional Multi Patches

In addition to 16 the embedded-style multi program which store all 16 single parts within the patch, TIOS 1.1 offers 112 “traditional” multi programs which store references to the single mode patches in RAM A-D and ROM A-Q.

The additional multi patches can be found on program number 17-127.

## Search by Name

Search by name enables you to search patches by their name or a fraction of the name. You can also use the new feature to search for your favourite sound designer’s signature patches. Details can be found within the Virus Control tutorial.

## Display of Original Value

Virus Control now displays the patch’s original value right when you tweak a certain parameter within the info bar. Details can be found in the Virus Control tutorial.

## Adaptive Soft Limited Algorithm

All outputs feature a build in soft limiter algorithm. The sophisticated algorithm prevents the Virus from clipping in case an output exceeds its headroom. The algorithm works transparent and doesn’t color the signal unless it clips. It won’t do magic though - heavily clipped signals cannot be repaired and will continue to sound distorted. Mildly clipped signals will remind you of a smoothly clipping valve instead of a harsh digital clipping.

## GLOSSARY

### PWM

This stands for ‘Pulse Width Modulation’, and traditionally refers to the dynamic variation in the width of the duty-cycle of a square wave.

If you would like a more in-depth explanation, please click on the following link:

[http://en.wikipedia.org/wiki/Pulse\\_width\\_modulation](http://en.wikipedia.org/wiki/Pulse_width_modulation)

## **Fundamental Frequency**

This is the name given to the lowest sounding harmonic in a given spectrum. Typically, this is the frequency that the human ear uses to determine the pitch of a sound.

If you would like a more in-depth explanation, please click on the following link:

[http://en.wikipedia.org/wiki/Fundamental\\_frequency](http://en.wikipedia.org/wiki/Fundamental_frequency)

## **Formant**

'Formants' are the peaks in the frequency spectrum of a given sound, created by a resonant body or system. Typically, they are associated with human speech, as it is largely the ways in which we alter the resonant characteristics of our mouth and nasal passages that determine the different vowel sounds.

If you would like a more in-depth explanation, please click on the following link:

<http://en.wikipedia.org/wiki/Formant>

## TUTORIALS

There is a new Tutorials folder on your harddrive which supplies you with demo sessions and written tutorials on how to get the best out of your TI and your sequencer. Also, the English user manual has been updated.

### **Mac user find all documentation here:**

/Applications/Access Music/Virus TI/Documents

### **PC user find all documentation here:**

Start Menu: Access Music\Virus TI\Documentation

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