VOID 2

VIRTUAL ANALOG SYNTHESIZER

Operation manual

sur-audio lab® 2012

VOID2

virtual analog
synthesizer

user manual

Introduction

Congratulations on choosing the new VOID2!
Includes the famous preset sound “Jupiters’ toy”.

The Sur-audio Lab team

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Specifications

Voices: 16

3 sound generators:
2 multi wave oscillators with standard wave shapes (saw, pulse, triangle, sine, noise)
1 wavetable oscillator with 63 different tables.
The multi oscillators can be arranged for the classic Sync function or for Frequency Modulation (FM) type of synthesis.
Ring modulation is also available.

Unison mode:
Every voice is produced by several detuned oscillators.

Morph function:
Every pot of the panel can be modulated by 4 controllers in parallel. These are: Velocity, Keyboard note, Pressure (aftertouch), Modulation wheel. The Modulation wheel can be replaced by any other midi controller.

Envelope generators: 2 ADSRs envelopes.

LFO's: Three Low frequency oscillators for modulation purposes. Two of these are multi-wave Lfo' s with rate, depth, key-retrigger, fade-in, fade-out, phase, pre-delay and each offers six waveforms to choose (sin-square-saw up-saw down-triangle-random).
The third is a triangle Lfo with abjustable rate, depth, key-retrigger, fade-in, phase, pre-delay.

Filters: One 24db Vintage Lowpass filter and one 12dB Multimode filter.

Effects: VOID2 includes a Stereo delay fx, a Phaser fx and a Chorus fx unit.

Sounds:
127 presets.

System requirements:
Compatible with any Sonic-Core DSP system hardware and software.

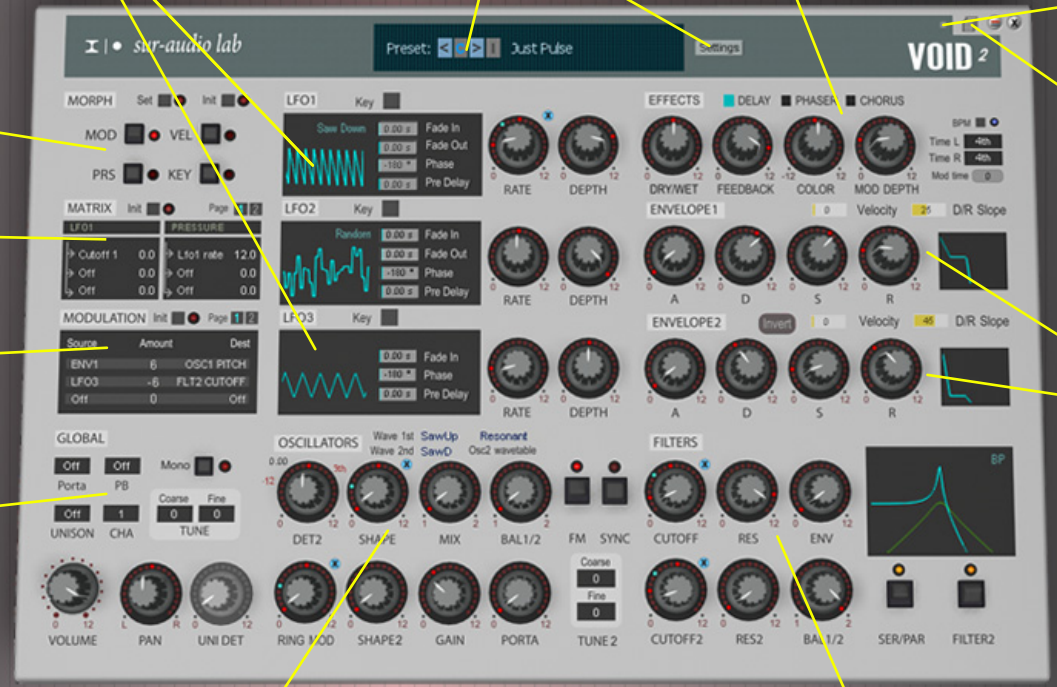
Device Setup

> Move *VOID2.dev* in your devices folder.
(c:\program files\SCOPE\devices\)

> Move *VOID2.pre* file in your preset files folder
(c:\program files\SCOPE\presets\)

> Use Live bar menu or drag the device
from the File browser into the Project window
and connect *midi in* and audio *outputs* as needed.

Panel



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Preset List handling

VOID2 synthesizer uses preset lists for storing sounds.
> Open the preset browser with the dedicated button at the upper right corner.

SELECTING PROGRAMS

VOID2 has one bank, containing 128 programs numbered from 0 to 127.

To try out some sounds, there are three basic methods of selection:

Sequentially

The most obvious way to select programs is by stepping through them using the buttons to the center of the display next to the preset name.

Via the Preset browser

Another way to choose programs is by selecting them through the preset browser.

Via MIDI

All MIDI sequencers and professional MIDI keyboards are capable of transmitting Bank and Program change messages via MIDI.

CREATING NEW SOUNDS

The INIT Program

The first preset has been reserved for a simple template, which you can use whenever you want to create sounds “from scratch”.

COMPARE

This button recalls the initial state of the selected preset.

Panel reference - Global

PORTA
> Off, Portamento to Fing. Gliss.: The PORTA text field sets the type of portamento or glissando (or set inactive).

PITCH BEND RANGE
> Off, 1 to 24: PB text field sets the amount of pitch bend in semitones (or set inactive).

MONO
> Off, On: This button selects whether the entire sound is polyphonic or monophonic.

UNISON VOICES
Unison means several instances of the same note detuned against each other at the same time. The trade-off is a reduction in polyphony.
> Off, 2 to 16: Number of voices used for each note.
If set to Off, no Unison parameters will be visible

CHANNEL
> 1 to 16, omni: Specifies the MIDI channel used

COARSE (semitone)
> -64 to +64: Coarse control over the pitch of the entire VOID2.

FINE (cent)
> -99 to +99: Fine control over the pitch of the entire VOID2.
A cent is one hundredth of a semitone.

PANORAMA
> -12 to +12: The position of the signal across the stereo outputs. Modulation destination “PAN“.

VOLUME
> 0 to +12: The overall gain of the sound.

UNISON DETUNE
> 0 to +12: The amount of detuning between instances of the same note.
For UNISON DETUNE to have any effect, the number of stacked (layered) voices must be greater than 1. (“UNISON VOICES”)

Panel reference - Global

GLOBAL SETTINGS

Settings

This menu is opened by pressing the SETTINGS button to the right of the top display.
It contains a few global parameters.

REPLACE MOD WHEEL

> Off, On. Set to On...

> 2 to 119 ...and the selected Midi Controller will be used as a Morph source instead of the Modulation wheel.

MORPH CONTROLLER

> 2 to 119: Default (CC64). The Midi controller that will act as the Morph assigning switch.

Tip The Sustain pedal uses CC64 (Midi continuous controller) by default. This is permanently connected to the envelopes. So instead of direct control, it is handy to specify a different controller here (e.g. CC63), in order to allow the control of the Morph Switch with the Foot Pedal without actually sending Sustain messages.*

Tip Set this value to “CC64-HOLD PEDAL” for direct use. If that is the case sustained notes will occur normally if midi notes are triggered during the morph assigning.

KEY FOLLOW CURVE

This text selector will select between a number of preset Key follow curves.

> 0 to 23: Default (0).

The selected Key Follow curve.

* A *Midi Transformer* should be used in the Sequencer between the physical device and the sequencer midi-in so to transform CC64 to CC63 or to any other.

Panel reference - Morph function

Morph function is a process for modulating any pot of the VOID2 panel by four modulators. These are Velocity, Keyboard Note, Channel Pressure (aftertouch) and Mod Wheel.

To activate the process, there are two basic methods:

Via any Midi controller or Foot pedal

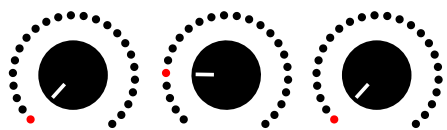
The Sustain Pedal or any other midi controller can be used as the Morph Switch. (For details see page 10 “MORPH CONTROLLER”).

Via the button *Set* Set

Use that button if you have no access to Midi pedals.

To assign a morph range proceed as follows:

> Press the Foot pedal or turn on the *Set* button. Rotate one or more pots to the desired value(s). Please do not change the Morph source during range assigning.



> Release the Sustain pedal or set the button *Set* to off position.

Morph reset Init

> To deactivate a specific range press the X button right to any assigned pot.

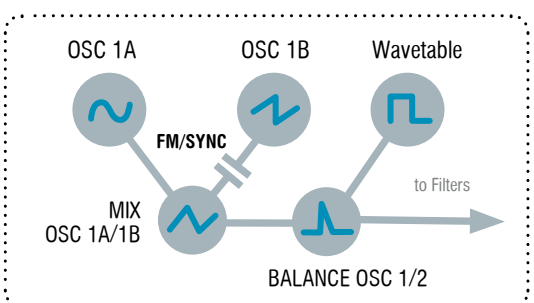
> To reset all the morph ranges, press the *Init* button on the top of the Morph section.

Tip Pressing the *Init* button regains DSP memory.

Panel reference - Oscillators

VOID2 has three oscillators, two Multi-wave oscillators and one Wavetable oscillator.
To change the waveshapes use the text fields on the top of the oscillator section.

Below is a small schematic of the oscillators internal structure.



DET2
> 0Hz to +12 semitones: This is the knob for tuning oscillator 1B.

SHAPE
> 0 to 12: Oscillator 1 Shape control.

	Normal	FM on	Sync on
Shape function	Pulse Width if pulses are selected	FM index (amount)	Sync amount (Osc1B pitch)

In other case, the Shape pot is not accessible

MIX
> 1 to 2: This knob controls the relative mix of oscillators 1A and 1B.

BAL1/2
> 1 to 2: This knob controls the relative mix of oscillators 1 and 2 while keeping the total level constant. The 12 o' clock position is a 50:50 mix of both these oscillators.

TUNE2
> -48 to +48: Use these fields to adjust the pitch of oscillator 2 over a range of -48 to +48 semitones.

> -99 to +99: Use these fields to adjust the pitch of oscillator 2 over a range of -99 to +99 cent.

SHAPE2
> 0 to 12: Oscillator 2 Wavetable Index. Controls the Index parameter–the nominal position within the table.

Panel reference - Oscillators

GAIN
> 0 to 12: This is a volume control for all three oscillators before the filter.

PORTAMENTO (TIME)
> 0 to 12: Often called glide. Portamento is particularly effective in mono mode (see “MONO” on page 9).

Tip If the number of UNISON NOTES equals the number of VOID2 assigned voices then the patch is in effect “big mono”.

SYNC
> Off, On: When this function is active, Osc 1A is synchronized to Osc 1B. Use the SHAPE parameter to alter syncronization rate. Look up Sync in the glossary if necessary.

FM
> Off, On: FM stands for Frequency Modulation. This means that the frequency of one audio source (Osc 1A) is modulated by another (Osc 1B) with amount determined with the SHAPE parameter.
As well as being able to create bell-like tones, FM is often used to add grit to a sound.

SYNC and FM functions are mutualy exclusive.

RING MODULATOR
> 0 to 12: This is a volume control for the ring modulation product (multiplication) between Osc 1 and 2.

Panel reference - Filters

The VOID2 has two filters that can be configured in series or parallel. Filter 1 has four poles (24dB per octave) and simulates the classic Minimoog™ low pass (including it' s typical selfoscillation). Filter 2 has two poles (12dB per octave). This adds up to a total of six poles i.e. 36dB per octave if BAL1/2 is centre (+0).

CUTOFF
> 0 to 12: The cutoff frequency of filter 1.

RES
> 0 to 12: The resonance of filter 1.

ENV
> 0 to 12: Controls how much the Envelope 2 affects Cutoff1 – like automating the CUTOFF knob with each and every note you play.

CUTOFF2
> 0 to 12: The cutoff frequency of filter 2.

RES2
> 0 to 12: The resonance of filter 2.

BAL1/2
> 1 to 2: Filter 1/2 balance. The relative contribution of the two filters. At 1 you can only hear the output of filter 1. In the central position (0), both filters contribute equally. At 2 you can only hear the output of filter 2.

SER/PAR
> Serial: The filters are routed in series.
> Parallel: The filters are routed in parallel.

FILTER2 (TYPE SELECTOR)
Using the FILTER2 button, you can set filter 2 to one of following types:
> LP=Low Pass: Allows frequencies below the cutoff point to pass through i.e rejects those above the cutoff point.
> HP=High Pass: Allows frequencies above the cutoff point to pass through i.e. rejects those below the cutoff point.
> BP=Band Pass: Allows frequencies close to the cutoff point to pass through.

To modulate filter 2 with an envelope or another modulator use the MODULATION or (and) the MATRIX section.

Panel reference - Lfos

There are three LFOs in VOID2 and each can modulate directly any or all destinations of the modulation or (and) the matrix section. Lfos 1 & 2 are multi-wave types. To change the wave type click on the waveform representation. The third Lfo is a triangle generator. To route the Lfos use the MODULATION or (and) the MATRIX section.

RATE
> 0 to 12: The speed of LFO.

DEPTH
> 0 to 12: How much the LFO modulates the Target parameter.

TYPE
> Sine, Triangle, SawUp, SawDown, Square, Random: The LFO waveform.

KEY (Retrigger On/Off)
> Off, On: When set to Off, LFO runs freely i.e. its phase is not reset by every note played. When activated, the starting point within the wave will retrigger at the Phase position.

FADE-IN
> 0 to 3 seconds: The time the modulation will gradually build to maximum.

FADE-OUT
> 0 to 3 seconds: The time the modulation will gradually fade to silence after key release.

PHASE
> -180º to 180º: Determines the position within the waveform (phase) at which the signal will start when a key note is received. KEY retrigger must be enabled for this to take effect.

PRE-DELAY
> 0 to 3 seconds: Delays the onset of the modulation.

Panel reference - Envelopes

There are two ADSR envelopes in VOID2.
The first one controls the overall sound level.
The other controls Filter 1 Cutoff frequency
via the Filters ENV pot. Both are sources
in the MODULATION and the MATRIX section.
They have abjustable Velocity sensitivity and
abjustable curves for the Decay and Release
slopes. All parameters for Envelope 1
are the same as those for Envelope 2.

ATTACK
> 0 to 12: The time it takes for the filter envelope to rise from 0 to maximum.

DECAY
> 0 to 12: The time it takes to fall from maximum to the Sustain level.

SUSTAIN
> 0 to 12: The level of sustained notes after the Decay.

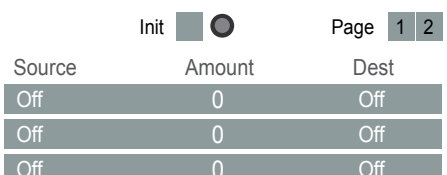
RELEASE
> 0 to 12: the time it takes to fade out after notes are released.

ENVELOPE VELOCITY SENSITIVITY
> 0 to 127: How much the envelope responds to keyboard velocity.

ENVELOPE 2 POLARITY
> Invert, on/off: When that button is lit envelope 2 effect is inverted.

Panel reference - Modulation

The MODULATION and the MATRIX section are the places where the modulators are routed to several parameters. The main difference between the MODULATION and the MATRIX section is that the modulation section works in audio-rate. This renders to better high frequency bandwidth.



Yet the matrix section is better suited for general multi-plexing. Also notice that the Modulation section slot amounts are destinations in the matrix.

SOURCE
> Off, LFO1 ... Env2: Specifies the modulation source (Envelopes, LFOs).

AMOUNT
> -63 to +63: Modulation amount for the specified destination. The range is bipolar so that modulation can be inverted.

DESTINATION
> Off, Osc1 Pitch ... Pan: Specifies the modulation destination.

Modulation matrix reset Init

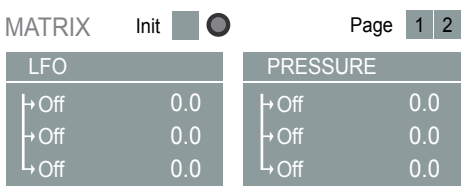
> To quickly reset all the values, press the *Init* button on the top of the modulation section.

Page selector

> 1, 2: Allows access to three more routings.

Panel reference - Matrix

VOID2 has a powerful section for patching. The modulators are routed to almost any parameter of the VOID2 synthesizer for a maximum of 12 parallel routings.



SOURCE
> Off, Pitch Bend ... Midi CC(119):
Specifies the modulation source.

AMOUNT
> -12.0 to +12.0: Modulation amount for the specified destination.

Modulation matrix reset Init

> To quickly reset all the values, press the *Init* button on the top of the modulation section.

Page selector
> 1, 2: Allows access to matrix slots 3 and 4.

Below is a list with the available sources:

Standard	Internal	Midi CC
Pitch Bend	LFO 1	All Midi CCs
Velocity	LFO 2	1-119
Mod Wheel	LFO 3	(Including Breath
Pressure	ENV 1	controller,
Key Note	ENV 2	pedals, etc.)
Poly Aftertouch		

DESTINATION
> Off, Osc1 Pitch ... Slot4 Am3:
Specifies the modulation destination.

Below is a list with all the available destinations:

VOID2 MATRIX DESTINATION LIST				
Osc1 pitch	Reso1	Env1 D	Delay send	Chor. phase
Osc2 pitch	Reso2	Env1 S	Delay Fdb	Slot1 Am1
Osc1 shape	Filter1 env	Env1 R	Delay Color	Slot1 Am2
Osc2 shape	Filter Bal	Env2 A	Delay Mod	Slot1 Am3
Osc1 Det2	Lfo1 rate	Env2 D	Phas. send	Slot2 Am1
Osc1 mix	Lfo2 rate	Env2 S	Phas. rate	Slot2 Am2
Osc Bal	Lfo3 rate	Env2 R	Phas. depth	Slot2 Am3
Osc gain	Lfo1 depth	Mod Slot1	Phas. Fdb	Slot3 Am1
Unison Det	Lfo2 depth	Mod Slot2	Phas. phase	Slot3 Am2
Ring mod	Lfo3 depth	Mod Slot3	Phas. offset	Slot3 Am3
Panorama	Lfo1 phase	Mod Slot4	Chorus send	Slot4 Am1
Pan spread	Lfo2 phase	Mod Slot5	Chorus rate	Slot4 Am2
Cutoff1	Lfo3 phase	Mod Slot6	Chor. depth	Slot4 Am3
Cutoff2	Env1 A	Porta time	Chorus fdb	

Panel reference - Effects

VOID2 has three standard effects processors. These are a Stereo delay fx, a Phaser fx and a Chorus fx. Most of the parameters of the processors can be modulated by the Morph or (and) by the Matrix and that makes the effects really interesting sound designing devices.

Stereo Delay FX

DRY/WET
> 0 to 12: The amount of the delay fx.

FEEDBACK
> 0 to 12: The amount of signal that is “fed back” in order to produce the repetitions or the delay’ s “tail”.

COLOR
> -12 to 12: The colorisation of the delay fx. Adjusts the amount of high frequency filtering.

MODULATION DEPTH
> 0 to 12: The modulation of the signal in the feedback path. The modulator is LFO2 (fixed). Please raise MODULATION TIME above zero for the function to have any effect.

Tip Please note that the modulation of the Delay time by any waveform with sharp edges (saw, pulse, random) produces clicks. Use a triangle or a sine waveform instead.

TIME LEFT, RIGHT
> 0 to 5.5 seconds: Delay time in seconds.
> 2 bars P to 16P: Delay time synced to Internal Tempo. The delay for the left and right channels respectively, according to the BPM switch status.

BPM
> Off, On: Set to On in order to adjust the delay time in subdivitions of the internal TEMPO.

MODULATION TIME
> 0, 1024: The delay modulation time in samples. Set to any value above zero in order for the Delay modulation to have any effect.

Panel reference - Effects

Phaser FX

DRY/WET
> 0 to 12:
The amount of the phaser fx.

RATE
> 0 to 12: Controls the frequency of the phase modulation of the Phaser.

DEPTH
> 0, 12: Controls the amount of the phase modulation.

FEEDBACK
> 0 to 12: The amount of the processed signal fed back into the input.

PHASE
> -180º to 180º: The phase difference between Left and Right channels inside the phaser fx unit.

OFFSET
> 0 to 127: An offset (DC) added to the phaser modulation.

Chorus FX

DRY/WET
> 0 to 12:
The amount of the chorus fx.

RATE
> 0 to 12: Controls the frequency of the modulation of the Chorus fx.

DEPTH
> 0, 12: Controls the amount of the chorus modulation.

FEEDBACK
> 0 to 12: The amount of the processed signal fed back into the input.

PHASE
> -180º to 180º: The phase difference between Left and Right channels inside the Chorus fx unit.

A Quick Programming Tutorial

Here is included a small programming tutorial for getting to know the VOID2 synthesizer by performing some simple "hands-on" exercises. Indeed we are going to discuss two of the preset sounds that are included in the preset list of the VOID2 in order to illustrate functions like Morph and Matrix modulation. Also some general synthesis will be covered.

Tutorial 1

Preset name:

Radio Astronomy (Program 8).
Category: Synth FX

For this first tutorial we' d like to design a synthesizer FX sound, and to become accustomed with the Morph function and the multiplexing of signals in the Matrix section.
This is a simple futuristic sound that can be used when the context specifies a mechanical and technological aesthetic. It doesn' t bears any real musical content except perhaps the robotic vowel timbres that come along now and then. It suits perfectly for the demonstration of the Morph function, the matrix modulation and some programming technics.
The patch utilizes the three Lfos and Pressure (aftertouch) as modulators. These modulate other parameters with purpose the creation of some controllable noise.
Pressure is connected via the Morph function to the Rate pots of Lfos 2 and 3 and controls the oscillation speed of both Lfos. We did so because in that patch we wanted to control the "amount" of the fx in a reliable and expressive way. We will discuss how this is done during this article.

Sound generators //

> Select program 0 (Init).
Play a note on your keyboard.

Because the Unison function in order to work properly needs more than one voices assigned to the synthesizer, if you haven't done that already, please raise the VOID2 total voices to anything above one. For that particular patch eight to ten (8-10) voices will suit to allow several Unison notes to sound in parallel.

> Set UNISON NOTES to 2.
The Unison Detune Pot will become accesible.

Now each "voice" will use two instead of one real voices. These are detuned against each other by amount determined by the Unison Detune pot.

> Press a note and slowly turn Unison Detune pot to +2. Listen how the sound gets smeared and diffused but also how it grows bigger.

In the creation of fx sounds the Ring modulation function is perfectly suitable. In essence it multiplies Osc1 and

Osc2 (wavetable) together and that creates a lot of unharmonic frequencies that consists an integral part of many synthesizer fx sounds.

> Turn Osc Gain to 0. Listen that all sound sources are silenced.

> Turn Ring Modulation to around 3-4. Now only the output of the ring modulator is sounding.

> Turn Tune2 Coarse to 48.
That tunes the wavetable oscillator 48 semitones (4 octaves) above oscillator 1.

We do that in order to produce some strong interaction between the oscillators.

> Activate Osc1 FM by pressing the FM button. (Osc1 Shape pot becomes accessible). Set oscillator1 wave types to Sine and Pulse. Now the Shape pot determines the amount of osc 1B (the pulse) frequency modulation (FM) to Osc1A (the sine).

> Turn Shape1 to around 5-6.
The sound gets a lot brighter.

With that step we have actually introduced the FM modulation of osc 1B to Osc1A. We will change the frequency of Osc1B in the next step. Notice that the FM signal actually appears at oscillator Osc1A. The Osc Mix pot determines the relative balance between Osc1A and Osc1B. Turn Osc Mix to position 1 in order to hear the FM effect or set it in a position that sounds appropriate. (that also implies for the Sync effect).

> Turn Osc1 Det2 anywhere below 12 or enter the desired value with the computer keyboard after selecting the small indicator.

We are looking for something unharmonic here, so anything is fine except octaves, 3rds, 5ths or any other consonant scale step. Osc1 now produces a kind of a metallic timbre.

> Set Osc2 wave type to SinSync1.

> Set Lfos 1 and 2 to Random waveforms by clicking on the waveforms representation.
Lfo 3 cannot be changed.

T*he random Lfos produces some chaotic movement that suits general synth fx sounds and everything else when not repeatible movement is desired. Pressure provides here the controllable movement.*

Ok. Everything regarding the sound sources is ready and only the assigning of some real time control is left for the sound to be completed. Now we are going to assign some modulators in the matrix and in the modulation section so to be able to hear some action during the Morph assigning.

Matrix and Modulation section //

> At the matrix set Slot 1 source to Lfo 2.

Now Lfo2 will modulate any or all of the three destinations of the current slot with different selectable amounts.

> Set Slot 1 destinations to Osc1

Shape, Pan spread and Panorama respectively.

> Set the three amounts to +12.

Lfo2 now modulates the three destinations with maximum amount. Notice that Lfos Depth pots are controlling the Lfos outputs before the matrix and they should be turned up in order for the Lfos to have any effect.

> Turn Lfo1 and 3 Depths to 10.

> At the MODULATION section set source 1 to LFO1, destination 1 to Osc1 pitch and amount 1 to 25.

Lfo1 now modulates Osc1 pitch with the specified amount. Because Lfo1 is configured to produce a random (noise) waveform Osc1 changes pitch abdruptly.

> Set source 2 to LFO3, destination 2 to Filter2 Cutoff and amount 2 to 25.

Lfo3 now modulates Filter2 Cutoff. Press Filter2 button and set it to BP (Bandpass) if it isn't already in that position. Turn Filter2 Cutoff pot to around 1-2 so to allow the modulator to sweep a broad band of the filter.
This is the basis of subtractive synthesis. A timbre rich in frequencies is filtered in order to deliver a spectra more interesting and smooth. To properly listen to Filter2 output turn Filter Balance to position 2. If the routing between the filters is serial (purple color) then only the output of Filter2 is sounding.

The last step aims to modulate the Lfos Rate pots with the Pressure controller so to permit control of the sounds intensity. This demonstrates the morph assigning procedure.

Morph Assigning //

> Turn Lfo 1 and 3 rates pots to somewhere around 2-3.

This is a "prepare step" because we want to assign a positive morph range for the rate parameter to turn up with the PRESSURE. If we needed negative range the logical start position of the pot would have been up.

> Select the PRS (PRESSURE) button at the morph section if it isn' t already selected.

> Press and keep pressed the Foot pedal or turn on the Morph *Set* button.

> Rotate Lfo 1 and 3 rates pots without releasing the foot pedal.
You can now see and fine-tune the ranges, watch movement at the Lfos waveform displays and also hear the changes of the sound.

> Release the foot pedal or put Set button to Off position. The morph ranges are assigned.

That' s it! End of tutorial 1.

A Quick Programming Tutorial

Tutorial 2

Preset name:

Super Fat (Program 3).
Category: Synth Hit

For this second tutorial we' ll discuss the programming of a brilliant synthesizer Hit sound. You will see that the design of the sound is quite simple but the effect is astonishing. This is one among several others cutting edge electronic synth sounds that found an easy way to the commerce. The patch uses only a slot at the matrix, but it' s a good occasion to continue our conversation. We will talk some more about the Unison and introduce the Sync function and the Effects.

The patch uses Lfo 1 and Lfo 2 as modulators. Lfo 1 is used as a source at the matrix and Lfo 2 is used to modulate the Delay Fx Time. That latter modulation is internally fixed and it doesn' t requires any further assignment. However we will have to abjust the Delay Modulation Time and Depth to actually hear the effect. We will discuss how this is done during this article.

Sound generators //

> Select program 0 (Init).
Play a note on your keyboard.
Because the Unison function in order to work properly needs more than one voices assigned to the synthesizer, if you haven't done that already, please raise the VOID2 total voices. That particular patch will benefit from as many voices as you can assign to it. It uses UNISON with "all " voices which actually means "big monophony". Only one note can sound at a time but that note will utilize all the available voices leading to one huge timbre. The patch also uses Portamento function that will make the played notes to slur (glide) one to another.

> Turn down the Master Volume to around 5. This will compensate for the raise of the volume that will occur after the big number of unison notes that we will assign at the next step.

> Set UNISON NOTES to 16.
The Unison Detune Pot will become accesible.
Now each "voice" will use "all" instead of one real voice. These are detuned against each other by amount determined by the Unison Detune pot.

> Press a note and slowly turn Unison Detune pot to +4. Listen how the sound gets smeared and diffused but also how it has grown bigger (a lot bigger).

Unison is a marvelous tool in the programmers hands. It transforms almost everything to something with interest and potential.

> Set Mater Coarse Tune to -12. This will drop the whole pitch of the synthesizer by one octave.

> Turn Osc1 Det2 to 12. This will tune Oscillator 1B an octave above oscillator 1A.

> Set Tune2 to -12. This will drop the pitch of Oscillator 2 (wavetable) an octave below Oscillator 1A. (Two octaves below Osc 1B).

With these steps we have "spread" the three oscillators to cover a bigger section of the spectrum, giving the impression of better frequency distribution. Most sounds do need a balanced frequency distribution between the three main bands (low-mid-high) so to sound "normal".

> Use the textfields at the oscillators to set the waveforms to SawUp, Pulse and for the wavetable Osc2 to "Glassy".

Now Osc1A is a SawUp, Osc1B a Pulse and Osc2 the specified waveform. We 'd now to like to abjust the relative volume of the oscillators.

> Engage the Sync function by pressing the Sync button.

Now Osc1A and Osc1B are configured to produce the Sync function.

> Turn Osc Mix pot to round 2.

We can now hear mostly the sync effect.

> Turn Osc Bal1/2 pot to around 3.

That mixes Osc2 with the other oscillators. In that particular patch Osc2 is used as a "sub" bass. The "Glassy" waveform that we have selected for Osc2 is rich in harmonics and it suits fine as a low pitch element to the sound and that's exactly what we've done at the previous steps.

> Turn Shape1 pot a bit to 1-2.

That makes the Sync effect more pronounced.

> Turn Ring Mod pot to around 3.

That mixes the ring modulation output (Osc1xOsc2) with the other oscillators. That adds an extra portion of high frequency harmonics to the sound.

> Turn Shape2 pot to around 8.

That sweeps through the Osc2 wavetable "index". In effect it selects a different harmonic pattern for Osc2. There are hundreds of different timbres that "hide" in the relation between different harmonic spectra and it is common to pass these through a Ring modulator to greaten the effect. This is a powerful procedure. For an exampe this is the way plucked strings are produced with subtractive synthesis.

> *At the Global* set "Porta" to Portamento. Turn Portamento Time pot to around 4-5.

Play the keyboard. Notice how the notes slur (glide) one into the other with glide time controllable with the Portamento time.
Ok. Finished with the oscillators. There are a couple of settings left so to finish the sound. Let's go to Envelope 1, the Amplifier envelope. Raise the Attack time and the sound will fade-in. This will give the sound a "pad" form, which reminds and acts in general as the slow passages of the classical orchestras' strings section.

> Turn Env1 Attack pot to around 10.
> Turn Env1 Decay pot to around 6.
> Turn Env1 Sustain pot to around 2.
> Turn Env1 Release pot to around 3.
Now the sound fades slowly in and when finished it makes a downfall movement (decay time) until reach the sustain level.

> Turn Env2 Attack pot to 0.
> Turn Env2 Decay pot to around 3.
> Turn Env2 Sustain pot to 0.
> Turn Env2 Release pot to around 3.
Most sounds sound better when the filter acts as a physical simulator. What happens in nature? The actuation of a note, or a string produces high frequencies that gradually fall down to silence. We mimic that behaviour with the filter. That particular preset sound does not need a lot of that treatment, just a tiny amount of filtering will suit it.

> Turn Filter1 Cutoff pot to 10.
> Turn Filter1 Resonance to 4-5.
> Turn Filter Env Pot to 1-2.
The last step causes Envelope 2 (the filter envelope) to modulate Filter1 Cutoff frequency a bit.

> Turn Filter2 Cutoff pot to 1.
This is done to allow the modulator to sweep a broad band of the filter.

> Turn Filter2 Resonance to 4-5.
> Be sure Filter Bal 1/2 points to "2" so to hear the output of Filter2.

Matrix and Modulation section //
> At the matrix set Slot1 source to Lfo1.
> Set Slot1 destinations to Pan spread, Unison detune and Cutoff2 respectively.
> Set the first two amounts to 4 and the last to -6.
> At the MODULATION section set source1 to ENV1, Destination1 to Osc1 Shape and Amount1 to 6.
> Set Lfo1 fade-in time to one second (1s).

Effects //
The sound is almost ready. We just have to assign some effects for polishing.

> Press the DELAY button on the top of the effects area so to access Delay FX controls if it isn't already pressed.

> Turn Delay Dry/Wet pot to 10.
> Set delay times for the left and right channels as wish.
> Turn Mod Depth to 5.

For the modulation of the delay times to actually produce any effect the MOD TIME should be raised to anything above zero.
> Set MOD TIME to 150.

> Be sure LFO2 waveform is a triangle because that is the modulator (internally fixed) for the modulation of the delay times. Other types will produce clicks.

> Press PHASER button at the top of the effects section.
> Just raise DRY/WET pot a bit.

That' s it! End of tutorial 2.

VOID2XTC

Features:
- Total recall. All plug-in settings are saved with the song.

Cons:
- Latency is in general longer
- no Routing Window

SYSTEM REQUIREMENTS
The VOID2 VST plug-in is available for the Windows PC platform (as VSTi in XTC mode).
There are no specific system requirements:
VOID2 should run within any professional host program.

INSTALLATION
Simply run the setup program and follow instructions.

Appendix A - Glossary

A

- Aftertouch
Term for Channel Pressure

B

- Balance
Simultaneous control over the relative levels of two signals. (cross-fade).

C

- CC
MIDI continuous controller number. Several of these numbers have been specified e.g. Modulation wheel=CC01. The list of sources in the VOID2 Morph modulator selector includes an extensive list of these (1-119).
- Channel Pressure
Monophonic aftertouch. MIDI data caused by pressing harder on the keyboard after playing notes.
- Continuous Controller
See CC.
- Cross-fade
The mix of two successive sounds in such a way that they appear to blend smoothly from one to the next.
- Cutoff
Threshold frequency of a filter above and/or below which frequencies are attenuated or boosted. Resonance accentuates frequencies close to the cutoff point.

D

- dB (Decibel)
Relative unit of attenuation or gain.
- DSP
Digital Signal Processor.

E

- Envelope
Synthesizer module originally used to simulate the way a note appears and fades out. Can also be used for many other purposes (e.g. filter cutoff, pitch).

F

- Filter
Module present in all subtractive synthesizers used to pass certain frequencies while rejecting/attenuating others.
- FM
Frequency Modulation (e.g. FM synthesis). Pitch modulation when the source and destination are both audio signals, resulting in a compex tone.
- Frequency
Speed of oscillation.

G

- Glide
See Portamento.

H

- Hertz (Hz)
Measurement of frequency.

K

- Key Follow
Modulation source proportional to the MIDI note number i.e. which key you play.

L

- LFO (Low Frequency Oscillator).
Generally used as a cyclic modulation source.

M

- MIDI
Acronym for Musical Instrument Digital Interface. The standard protocol used for communication between electronic musical instruments and computers.
- Modulation Wheel
General-purpose performance control. Often used for controlling vibrato depth.
- Monophonic (Mono)
Only one note can be played at a time e.g. flute. See Polyphonic.

O

- Octave
A musical interval 12 semitones apart.

P

- Panorama (Pan)
The position of an audio signal in a stereo field i.e. the left/right volume ratio.
- Parallel
Routing term: Not connected one after the other (see Serial), but alongside each other.
- Phase
The position within one cycle of a wave. Measured in degrees, whereby 360˚ is the end of the cycle.
- Pitch
Frequency (e.g. how low/high a note is). Pitch is mainly used for musical notes, while frequency is the more scientific term.
- Pitchbend
MIDI data usually derived from the sprung wheel (stick) to the left of a MIDI keyboard.
- Pole
Units of -6dB per octave gain attenuation in filters.
- Polyphonic, Poly
When several notes can be played at the same time. See Monophonic.
- Portamento
Classical term for gliding pitch from one note to the next. Often called glide.
- Preset
Often used as a synonym for patch, sound, program etc.
- Pulse wave
Oscillator waveform alternating between two discrete levels.
- Pulse Width
The ratio between the lengths of the upper and lower levels in a pulse wave.

R

- Random
Something that happens without regularity.
- Resonance
Boosting of frequencies close to the cutoff point in a filter (via feedback).

S

- Sample
Measurement of time in digital audio. One second of audio is “sampled and holded” or divided 44.100 times in one second. So one sample is equal to 1/44100 second.
- Semitone
Pitch interval equal to one twelvth of an Octave. The keys on a keyboard are a semitone apart.
- Serial (in series)
Routing term. The signal is sent to one module (e.g. a filter), which in turn sends its output to another module (e.g. another filter). See also Parallel.
- Slave
Module which is following parameters set by another module.
In the VOID2, oscillator 1B is optionally a slave of oscillator 1A.
- Square wave
Special form of Pulse wave in which the Pulse Width is exactly 50%.
- Subtractive synthesis
The method of creating sounds by removing frequencies from complex waveforms.
- Sync
Synchronization. In oscillator sync, one oscillator resets the phase of another.

U

- Unison
Several instances of the same note at the same time.

V

- Vibrato
Cyclic pitch bend (usually around 5Hz).
- Voice
A complete sound-generation unit (oscillator, filter, envelope, LFOs etc.). A monophonic synthesizer has only one voice. Unison mode uses 2 or more voices per note.

X

- XTC mode
Special SCOPE hardware utilization mode that uses SCOPE devices inside the host sequencer.

Appendix B - Patch Names

1. Iomi synth ..... SynthBass
2. Mercury synth ..... SynthKeys
3. Super Fat ..... SynthHit
4. Eastern strings ..... Keyboard
5. Full strings ..... Strings
6. Big ring ..... SynthBass
7. Unison keys ..... SynthKeys
8. Radio astronomy ..... SynthFX
9. Big Glide ..... TechnoBass
10. Delayed strings ..... Strings
11. Aliens2 ..... SynthFX
12. Hoover bass ..... SynthBass
13. Space pad ..... MotionPad
14. Just Pulse ..... HardLead
15. Bend impulse ..... SynthFX
16. Psy grit ..... SynthFX
17. Stringer keys ..... SynthKeys
18. Piano 1 ..... ElPiano
19. Space pad 2 ..... BrightPad
20. Bass tight ..... ElBass
21. Space keys ..... SynthKeys
22. Unison forte ..... TechnoSyn
23. Wormhole ..... SynthFX
24. Power signal ..... SynthFX
25. Compact chords .. SynthKeys
26. Meta Violin ..... SoloStr
27. Delayed strings 2 ... Keyboard
28. Robo classroom ..... SynthFX
29. Epic lead ..... HardLead
30. Jupiter' s toy ..... SoundFX
31. Hard Ring ..... HardLead
32. Ambient keys ..... Keyboard
33. Phaser seq ..... Sequencer
34. Smooth timbre ..... Softlead
35. Space gates ..... SynthFX
36. Sub bend ..... SynthBass
37. Soft keys ..... Keyboard
38. Psy keys ..... Keyboard
39. Strings ..... Strings
40. Minor Saws ..... SynthKeys
41. Brassy Spacekeys .. Keyboard
42. Psy vocal seq ..... TechnoSyn
43. Alien warp ..... SynthFX
44. Sync X ..... Sequencer
45. Duo ..... SynthDrone
46. Saw Hp ..... Sequencer
47. Alien fx ..... SynthFX
48. Big Pad ..... DarkPad
49. Responsive Drone . SynthDrone
50. Cosmos strings ..... SoftPad
51. Tortured acid ..... TechnoSyn
52. Vibrato El. violin ... SynthKeys
53. Sub pad ..... DarkPad
54. Cello2 ..... SoloStr
55. Sub bass ..... SynthBass
56. Strings pad ..... DarkPad
57. Broken connection ... SynthFX
58. EP 1 ..... ElPiano
59. EP 2 ..... ElPiano
60. Synth Feedback .... SynthKeys
61. Smooth dist ..... HardLead
62. FatSweeper ..... HardLead
63. OrganPad ..... Organ
64. MellowPad ..... SoftPad
65. Big fall ..... SynthFx
66. Distorted ..... TechnoSyn
67. Chimes ..... SynthFX
68. Plucky bass ..... SynthBass
69. Fatty ..... SynthDrone
70. Delayed keys ..... SynthKeys
71. Deep filter ..... TechnoSyn
72. Aliens approaching ... SynthFX
73. Transport Fx ..... SynthFX
74. Psy Hp ..... Sequencer
75. Small trumpet ..... Trumpet
76. Trumpet ..... Trumpet
77. Organ strings ..... Organ
78. Grotesque trumpet .. Trumpet
79. Soft mono keys .... SynthKeys
80. Electro strings ..... Strings
81. Nirvana keys ..... Keyboard
82. Brit ..... HardLead
83. Noise fx ..... SynthFX
84. Hard lead ..... HardLead
85. Bright pad ..... BrightPad
86. Simple keys ..... ElPiano
87. Hard fuzzy ..... SynthDrone
88. Psy leader ..... HardLead
89. Ext environment ..... SynthFX
90. Infinite delay ..... SynthFX
91. Strings ..... Strings
92. Soft pad ..... SoftPad
93. Metal strings ..... ElGuitar
94. Solo string ..... SoloStr
95. Bright digi ..... HardLead
96. Voko drone ..... SynthDrone
97. Freeze timbre Fx ..... SynthFX
98. Simple kick ..... ElDrums
99. HH Velo Kick ..... ElDrums
100. Plucked keys 2 ..... ElGuitar
101. Filter sweep ..... Sequencer
102. Bowed synth ..... SynthKeys
103. Filter sweep ..... TechnoSyn
104. Bright brass ..... SynthKeys
105. Psy Pad ..... SoftPad
106. Psy sweeper ..... Sequencer
107. Big mono stab .... SynthDrone
108. Bells ..... Bell
109. Warm strings ..... SynthKeys
110. Psy squelch ..... TechnoSyn
111. Synth Bliss ..... SynthFX
112. Deep drone ..... SynthDrone
113. Random Perc ..... ElPerc
114. Cyclic Fx ..... SynthFX
115. PacMan keys ..... SynthFX
116. Plucked keys ..... Keyboard
117. Bend Fx ..... SynthFX
118. Piano delayerMW ..... ElPiano
119. Pad slow ..... SoftPad
120. Phase bass ..... SynthBass
121. Beating Fx ..... SynthFX
122. Distorted key ..... SynthKeys
123. Chorus pad ..... BrightPad
124. High Brass ..... SynthBrass
125. Brassy 2 ..... SynthBrass
126. High xiss ..... SynthFX
127. Evacuate the synth ... SvnthFX

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VOID2

Sur-audio Lab
Einardou 7, Victoria Sq,
10440 Athens
Greece
sur-audio@yahoo.com