SynthEdit Overview

Analogue Synthesis
SynthEdit is modelled on the classic Analogue Synthesiser.   Before the days of pre-set synthesisers, electronic musicians had to create sounds the hard way, by assembling 'modules', boxes that created or modified sound in some way.   Wires called patch cords connected the modules.   Although this was time consuming, you had complete freedom in designing your sounds.   SynthEdit brings back the 'Analogue' synth, and adds a few features from the MIDI era.

Note: Strictly speaking, SynthEdit isn't an Analogue synth, it's an emulator.

Voltage Control
Voltages control most modules.   Connect them up any way you can imagine.   Most inputs have a useful range of between 0 and 10 Volts.   You can also set an input's voltage directly.   Right clicking on a module and choosing 'Properties' gives you a list of parameters.   You can enter a voltage directly for each input.

Other connections
Some module's parameters can't be represented by a Voltage.   Inputs are colour-coded to show the type of data.
Blue - Normal Voltage input. Connect these to other modules or a control 'Slider'.
Red - Text data, Connect a 'Text Entry' control to these.
Green - A list of values e.g. Waveform names.   Connect a 'List Entry' to these.
Yellow - MIDI data

Note: New connections don't take effect untill you restart the sound by pressing the Play button (F5)

Parameters
Some modules have extra parameters.   Access these by Right clicking on the module and choosing 'Properties'.   You can also directly set plug's input values here.   These default setting are overidden when you connect patch cords.

Polyphony
SynthEdit is polyphonic.   SynthEdit can emulate several independant synths simultaneously.   Each independant synth must be created within a Container' module, and must contain one 'MIDI to CV' module.   Each time SynthEdit receives a 'Note-On' command, it duplicates the container's contents. This allows several notes to sound at once.   The container controls the maximum number of notes (voices) that can play (Right click the container, choose 'Properties', 'Polyphony').   Polyphony can range from 1 to 127 notes.   The bigger you set this value the more CPU power SynthEdit uses, try to keep polyphony as low as practical.

Contents

SynthEdit Modules

ADSR (Envelope Generator)
Provides a 4 stage envelope.
Attack - the rate the ouput rises to 10V
Decay - the rate it falls to the Sustain level
Sustain - a level from 0 to 10 Volts
Release - the rate the output falls to zero.
Level - scales the output by a fixed amount.

This module provides a standard 5 section envelope.   The attack, decay and release times are based on an exponential scale.   You can use negative voltages for shorter durations.

Voltage	Time
0	10 ms
1	20 ms
2	40 ms
3	80 ms
4	160 ms
5	320 ms
7	1.3 s
8	2.5 s
9	5 s
10	10 s
11	20 s

Audio In
Use this module to input sound from an external souce (e.g. microphone), or from a WAVE file.   Some soundcards won't allow simultaneous audio input and output.   Using several of these you can input several tracks of audio at once.   There is no limit to file size.   If you trigger this from a MIDI to CV module, you can play wave files polyphonically.

Parameters:
Filename
Pitch Shift - 5 Volts is no change in pitch. 4 volts is 1/2 speed. 3 volts is 1/4 speed etc. (1 Volt per Octave)
Mode - Soundcard In (Realtime input), or File (from a Wave file).   The 'Audio', 'Preferences' menu changes the Wave file path.

Audio Out
Sends output to the speakers, or to a file.   You are limited to one live audio out.   You can have as many 'File' outputs as you like.   This lets you record several 'tracks' of audio to your hard disk at once.

Parameters:
Left
Right
Filename
Mode - Speaker (Realtime output), or File (create a Wave file).   To change the location that SynthEdit saves wave files use the 'Audio', 'Preferences' menu.
Sample Time - How long in seconds to make the file.
Play Wavefile - Tick this to play the wavefile automaticly once done.
Report Stats - Displays the length of the sample, and how long it took to create (render).

Clipper

Limits the signal to a range between two Voltages.   This is called clipping.   Use this to distort the sound, or to limit a signal between two values.
Parameters:
Signal In
Hi Limit - The maximum output level, 0 to 10V
Lo Limit - The minimum output level 0 to -10V

Container
This is a special module that holds a group of modules(like a folder).   The contents of a container are polyphonic.   If you intend to use several independent synths, each should be in it's own Container.   To set the maximum number of simultaneous voices, right-click the Container and choose 'Properties', then choose 'Polyphony'.
   To see whats inside a Container, right click it and choose 'Structure'.   To see a container's controls, choose 'Controls'.   You can rename the container's plugs by right clicking and choosing 'Properties'.
   To group several modules into a container: select them (SHIFT-Click), then, from the Edit menu, choose 'Box Selection'.

Controllers
Converts MIDI Controllers like Modulation Wheel etc to voltages.

DCA
Controls the volume of a signal. 10V is full volume.   Connect an ADSR to apply a volume envelope to a sound.

Delay
Creates an echo effect.
Parameters:
Signal in
Modulation - changes the delay time.   5V = use the full delay time, 0V = half the delay time, -5V = no delay.
Interpolate Output - use this when modulating the delay time to smooth the changes in delay time.   Not needed for fixed delays.
Delay Time 0 to 10 Seconds

Filter
Changes the frequency content of the sound.   Provides Low Pass (only low frequencies pass through), High Pass, Band Pass, and Band Reject outputs.   The resonance control adds a peak to the response (great for dance music bass lines).

IO Mod
Provides a link in/out of a container.   Anyplug you connect to this will apear as a plug on the outside of the container.

List Entry
This control is for connecting to a 'List of Values' type plug, (green).   For example connect one of these to an Oscilator's 'Waveform' input.

MIDI Drum Trigger
Converts MIDI note data to individulal trigger signals, one per drum.
Parameters:

MIDI In
Provides live MIDI input.   Use the 'Audio' - 'Preferences' menu to change the source.   Due to the nature of software synthesis, there is a small delay between when you hit a note and when the sound starts.

Parameters:
Channel

MIDI Out
Provides live MIDI output, usually via your soundcard midi interface.   Use the 'Audio' - 'Preferences' menu to change the destination.

MIDI Player
Plays a MIDI file from disk.   SynthEdit's virtual MIDI cables operate at a much higher speed than standard MIDI, giving your music rock-solid timing accuracy.

Parameters:

MIDI to CV
This module converts MIDI notes into control voltages.   The midi note number is converted into a pitch voltage (1Volt per octave).   Connect this to an Oscilator or Filter to control frequency.   The Trigger output goes high while the key is depressed.   Connect the trigger output to an ADSR gate to trigger an envelope.   This module plays an important part in making SynthEdit Polyphonic. You must put each MIDI to CV module in it's own Container.
Parameters:
Channel
Gate
Pitch
Velocity
Aftertouch
Bend Range - Bend range in semitones.

Multiplier (Ring Modulator)
This multiplies one input by the other.   It can be used for ring modulation, or to apply an envelope to a signal (amplitute modulation), or to scale a signal by a fixed amount.   Note: to apply an volume envelope use the DCA module (it changes the volume of the signal, not the level).

Patch Select

This special control remembers the settings of the other controls.   Droping one of these into a synth allows 127 different patches to be stored.   Only the settings of sliders etc are stored, not the routing of the patch cords.

Push Button
Provides a pulse whenever the button is pressed.   You can set the 'On' and 'Off Voltage (0 to 10 Volts).

An inverted ouput is provided (does the opposit of the output).   You can set the button to 'Toggle', one push for On, one for Off.

Oscillator
The Oscillator is the starting point for many patches. It produces a choice of simple waveforms, plus white or pink noise.
Parameters:
Frequency - Set the pitch of the Oscillator output, the standard range is 0 to 10 Volts, but using lower voltages (-20 to -2 Volts) gives a Low Frequency Output (LFO).
WaveForm - Chose from Sawtooth, Ramp (inverted sawtooth), Triangle, sine and Pulse.   The pulse width setting affects the 'Pulse' wave (0 Volts produces a square wave, 9 volts produces a narrow pulse.

Slider
This control allows you to directly control an input voltage.   For example connect one of these to an Oscilatorst's 'Pitch' input.

Soundfont Player
Plays standard .SF2 (Soundfont 2) samples.   Currently only some basic Soundfont features are supported.   As this is a polyphonic module, you should put it inside a container.   Note, many soundfont files available contain ROM Samples.   These are samples assumed to already be on your soundard.   SynthEdit dosn't have these samples, so you may encounter 'dead' patches in some soundfonts.   Use a shareware program such as 'Awave' to check a soundfont file for references to ROM samples.

Text Entry
This control is for connecting to a Text Values' type plug, (red).   For example connect one of these to a Wave Out's 'Filename' input.

Editing in   SynthEdit

To insert a new module.   Use the insert menu, choose the module you want.   Alternate method-
Right click in the main window, choose 'Insert'.

To connect two modules.   Left click a modules connection point (the coloured text on the modules),
and drag a line to the destination module.   Note lines appear inactive (grey) untill SynthEdit is restarted
(Push the 'Play' Button again)

To delete a module.   Left click it to highlight it.   Press the 'Delete' key.

To delete a connection line.   Carefully click directly on the line until it is highlighted.   Press the
delete key.

To select several modules.   Hold the shift key and click each module.   Alternately: Left click above
and to the left of a module and 'drag' a box arround several modules.

To Toggle one module or line's selection.   Hold the 'Control' key and click a module.