HardSID MIDI v1.2

Welcome to HardSID MIDI

HardSID MIDI is the world's first MIDI environment for PCs featuring the legendary SID synthesizer chip. Its architecture and sonic capabilities are quite similar to what can be found in expensive professional synthesizers.

Today s popular music styles are very much based on the sound of old synthesizers and musician's demand for new musical instruments based on old sound synthesis methods (like real analog synthesizers, virtual analog synthesizers, software-based analog synthesizers, etc.) is enormous, which is why these instruments have enjoyed tremendous success in the past years.

The HardSID MIDI provides all the advantages that made the SID famous without its main disadvantage: our soundcard has an extremely low noise level compared to an original C64 s output. In addition, we implemented additional useful functions you would normally expect from a regular analog synthesizer today.

? **C64-to-Patch Conversion (NEW in v1.2!)**

? **HardSID MIDI Project Export/Import (NEW in v1.2!)**

? **Rhythm Channel feature (NEW in v1.2!)**

? user friendly Patch Editor

? flexible MIDI Channel Editor

? up to 12 polyphony in the same patch (driving 4 SID chips from a single patch!)

? 8 fully routable LFOs within the same patch (32 LFOs in one project)

? a wide range of MIDI-controllable parameters including filter cutoff, pulsewidth, pitch, envelope parameters, LFO parameters, etc...

? a four-stage (ADSR) filter envelope

? a four-stage (ADSR) pulse width envelope

? adjustable System Clock up to 500Hz (it is set to 200Hz by default)

? adjustable latency - can be as low as 5ms (the theoretical lowest average latency is 1ms at 500Hz)

? ...and lots of other great features!

There are two main parts of HardSID MIDI:

The **HardSID MIDI Synthesizer Driver** and the **HardSID MIDI Setup utility**.

The HardSID MIDI Synth is a standard MIDI port which can be selected in any MIDI sequencer as MIDI Output.

The HardSID MIDI Setup utility is a program for Patch Editing, configuring MIDI Channels, importing/exporting projects (including patch banks and channel setups), and setting up every property of the HardSID MIDI Synthesizer.

The HardSID MIDI Synthesizer appears to applications as a real standalone synthesizer port. You don t need to run the Setup Utility when you want to use your HardSID MIDI Synthesizer.

The HardSID MIDI Setup utility

The HardSID MIDI Setup lets you manage/edit your Patches, configure MIDI channels, export-import HardSID MIDI Projects, capture and analyze the output of SID players, SID trackers and C64 emulators and convert native C64 sounds into HardSID MIDI Patches!

Build: 1.2.0.1464
HardSID
the SiD soundcard for your PC
Version 1.2
Copyright © 1999-2003 Hard Software, Hungary
http://www.hardsid.com

You don t need to run the HardSID MIDI Setup utility just because you want to use your HardSID MIDI Synthesizer. You can use any sequencer program for composing HardSID MIDI songs.

Note for Win9x/ME users: The HardSID MIDI Setup utility isn t a MIDI sequencer/controller program under your OS. You need to use a MIDI sequencer to use the HardSID MIDI Synth (**Cakewalk, Cubase**, etc...). The Windows XP/2000 version can work as a stand-alone MIDI controller.

Common Settings

Current user

When you create a patch, this name will be saved with it, showing that you re the author of this patch.

If anyone downloads this patch from a patch database and loads it into a patch bank, the patch information will show your name.

Please enter your name here before creating patches!

System clock

Specifies the refresh rate for the HardSID MIDI. (20Hz..500Hz)

It s 200Hz by default. It means that everything will be updated 200 times in a second (four times faster than the average update frequency of old C64 tunes).

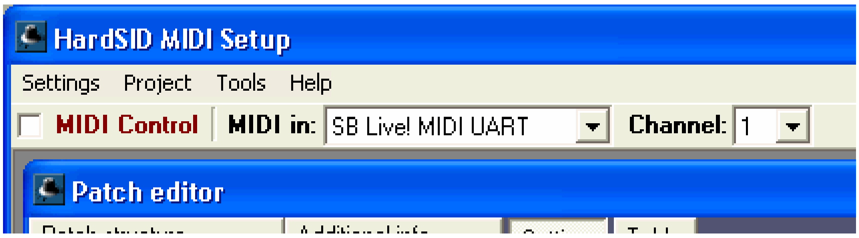
It also determines the average value of the HardSID MIDI latency. At the default 200Hz setting the latency will be around 2.5ms. You can go down even to around 1ms average latency if you raise the system clock up to 500Hz.

This value is pretty good on an average Celeron 300A.

If you don t need to modify this value, leave it on default for making the patch sharing easier between you and others!

MIDI Control Panel (WinXP/2000)

This feature is present in the Windows XP / Windows 2000 version only!



□ MIDI Control | MIDI in: SB Live! MIDI UART | Channel: 1

You surely know the annoying error message when a MIDI port is already allocated by another application. This won t happen with the HardSID MIDI, since the WinXP/Win2000 version of the HardSID MIDI Driver can handle multiple MIDI clients at the same time.

The MIDI Control panel uses this feature to connect the MIDI Setup Utility to your HardSID MIDI Synthesizer Driver without exclusively allocating its MIDI port.

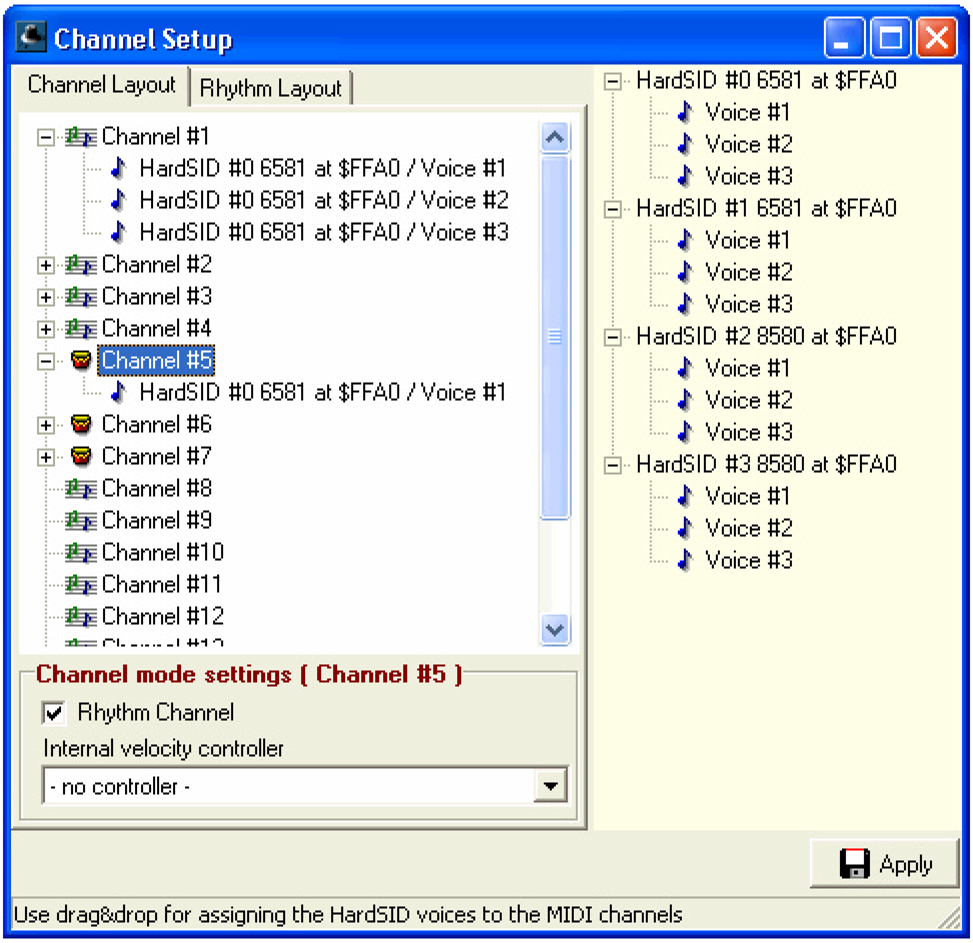
If you use a sequencer program (Cakewalk, Cubase, Logic, etc…), leave the “MIDI Control” checkbox unchecked or else both the sequencer and the HardSID MIDI Setup Utility will respond to incoming MIDI messages.

Turn the “MIDI Control” on if you don t use a sequencer program and you want to play with HardSID MIDI using your MIDI keyboard. You can select the MIDI input port you want to use from the “MIDI in” list. Select the MIDI channel to use from the “Channel” list or select “ALL” if you want to let your MIDI keyboard control the MIDI Channel selection.

Channel setup

The channel configuration is the heart of the HardSID MIDI.

You can make various channel settings using this window.



Channel #1
HardSID #0 6581 at $FFA0 / Voice #1
HardSID #0 6581 at $FFA0 / Voice #2
HardSID #0 6581 at $FFA0 / Voice #3
Channel #2
Channel #3
Channel #4
Channel #5
HardSID #0 6581 at $FFA0 / Voice #1
Channel #6
Channel #7
Channel #8
Channel #9
Channel #10
Channel #11
Channel #12
Channel #13

HardSID #0 6581 at $FFA0
Voice #1
Voice #2
Voice #3
HardSID #1 6581 at $FFA0
Voice #1
Voice #2
Voice #3
HardSID #2 8580 at $FFA0
Voice #1
Voice #2
Voice #3
HardSID #3 8580 at $FFA0
Voice #1
Voice #2
Voice #3

Channel mode settings (Channel #5)

☑ Rhythm Channel

Internal velocity controller: - no controller -

Use drag&drop for assigning the HardSID voices to the MIDI channels

All of the HardSID devices are shown in the yellow device tree.

Every device has three voices, since they all contain a SID 6581/8580.

The Channel structure tree on the left contains the channel definitions for the HardSID MIDI driver.

You can drag & drop SID voices into the MIDI channels. One voice can be assigned to more channels, which gives you a flexible system.

When you play a Patch on a MIDI channel, the driver allocates the next **n** voices from the channel, where **n** is the number of parts within the patch.

Of course you can t play a patch with 3 parts on a channel which has only 2 SID voices. If you try this, you ll get no sound.

So, you need at least as many voices as many parts your patch has.

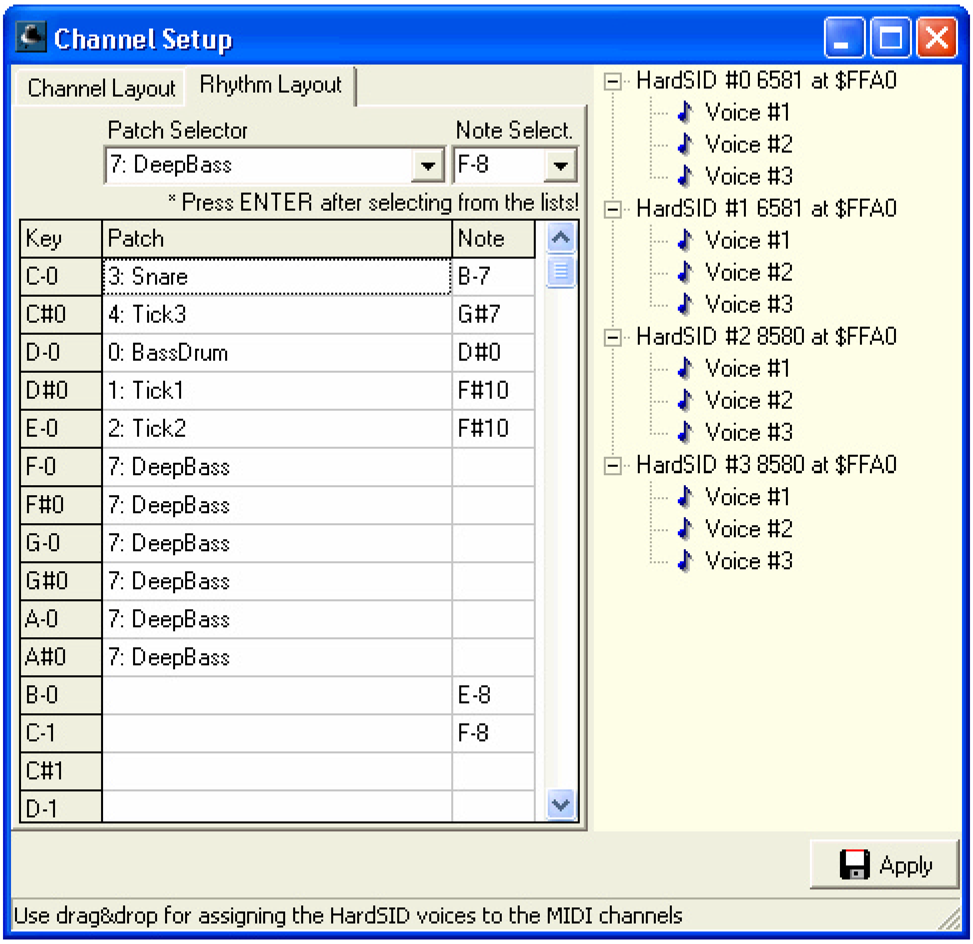
If you play a mono patch, the driver will always use the first voice of the channel.

Rhythm Channel

Rhythm channels are introduced in HardSID MIDI v1.2

Rhythm channels can be very useful when you want to make drum/percussion/rhythm tracks for your MIDI music. Normally, there is only one patch assigned to one channel, but drum parts require multiple patches, like bass drum, snare, hihat, etc… Since it is very difficult to insert patch change commands right before every single note-on in your MIDI events editor, you may want to use a special channel type which does this job for you.

In General MIDI, Channel #10 is the rhythm channel with pre-definied layout. In HardSID MIDI, you can mark any channels to be rhythm channels. So, you can have up to 16 rhythm channels if you wish (every rhythm channel has a drum icon). The rhythm layout is also variable. Take a look at this picture:



Patch Selector: 7: DeepBass
Note Select.: F-8

* Press ENTER after selecting from the lists!

Key	Patch	Note
C-0	3: Snare	B-7
C#0	4: Tick3	G#7
D-0	0: BassDrum	D#0
D#0	1: Tick1	F#10
E-0	2: Tick2	F#10
F-0	7: DeepBass	
F#0	7: DeepBass	
G-0	7: DeepBass	
G#0	7: DeepBass	
A-0	7: DeepBass	
A#0	7: DeepBass	
B-0		E-8
C-1		F-8
C#1		
D-1		

Use drag&drop for assigning the HardSID voices to the MIDI channels

You can assign different settings for every single key on your MIDI keyboard (to every MIDI note from 0..127 / C-0..G-10).

Patch: If you assign a patch to a MIDI key, this MIDI note will be always played using the patch you assigned to it. If you don t assign a patch to a key, HSMIDI will use a patch which has the same number as the current key (for example C#1 will be played with Patch #13 by default).

Note: If you assign a note to a MIDI key, this MIDI note will be always played at the pitch you assigned to it. If you don t assign a Note (pitch) to a key, it will be played with the key s default pitch (for example key C#1 will be played with C#1 pitch).

Our example screenshot shows a setup where keys C-0 .. E-0 are set up for playing percussion instruments, and F-0 .. A#0 are set up to play bass sounds with default pitch (F-0 .. A#0). Keys B-0 and C-1 are playing their default patches (#11 and #12) with E-8 and F-8 pitch.

As you can see, rhythm channels can be used for very complex setups. You can split your keyboard into many different ranges, so you can easily play drums, basses, flutes, pianos, etc... on a single channel without even sending a single patch change manually.

Internal velocity controller

Any HardSID Patch can be controlled by controllers which can be defined in the Part settings and LFO settings.

How can you control your patches by the actual key velocity?

The answer is the Internal velocity controller. When you hit a key on your MIDI keyboard (or a sequencer sends note data), the HardSID MIDI driver sends the key velocity value to the MIDI channel using this controller number.

It means that you can use it in your patches like a simple MIDI controller.

Patch editor

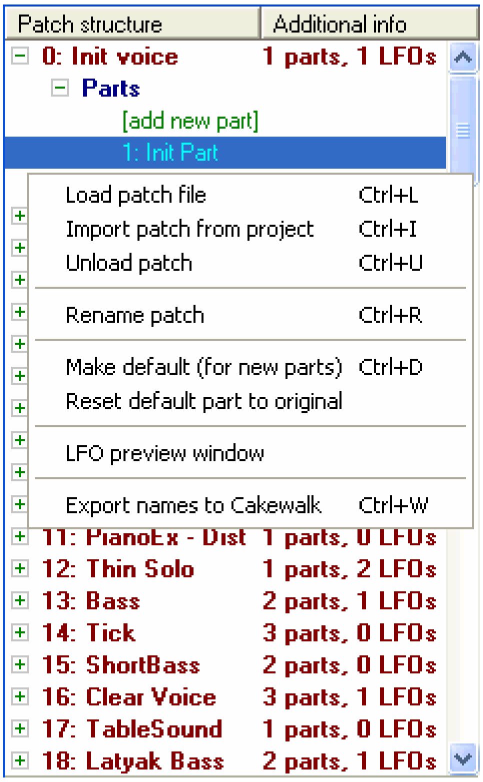
The Patch editor lets you create/modify/load/unload HardSID patch files.
The HardSID MIDI patch bank contains 128 patch slots which can be filled with your patches.

Patch structure

The Patch structure displays the patch information in your current setup. You can edit your patch bank and patches using the structure tree.

You can use drag&drop to copy a patch; part(s); LFO(s) to other patch; Parts section; LFOs section.

8 LFOs and 12 parts can be added to every Patch.
The HardSID MIDI driver can handle 32 LFOs at once, all of which can be fully routed within the patches.



Patch structure	Additional info
⊟ 0: Init voice	1 parts, 1 LFOs
⊟ Parts	
[add new part]	
1: Init Part	
⊞ 11: PianoEx - Dist	1 parts, 0 LFOs
⊞ 12: Thin Solo	1 parts, 2 LFOs
⊞ 13: Bass	2 parts, 1 LFOs
⊞ 14: Tick	3 parts, 0 LFOs
⊞ 15: ShortBass	2 parts, 0 LFOs
⊞ 16: Clear Voice	3 parts, 1 LFOs
⊞ 17: TableSound	1 parts, 0 LFOs
⊞ 18: Latyak Bass	2 parts, 1 LFOs

Load patch file Ctrl+L
Import patch from project Ctrl+I
Unload patch Ctrl+U
Rename patch Ctrl+R
Make default (for new parts) Ctrl+D
Reset default part to original
LFO preview window
Export names to Cakewalk Ctrl+W

Load patch file

Press Ctrl+L (or use the popup menu) if you want to load a patch file into the highlighted position. This patch can be accessed from MIDI sequencers (Cakewalk, Cubase, etc.) by its index (number). Use the 0..127 patch numbering style!

Import patch from project

Press Ctrl+I (or use the popup menu) if you want to import a patch file into the highlighted position from a HardSID MIDI Project (.hrp) file on your HDD without importing the project. (for example if you quickly need some drums from an archived project) Learn more at the ‘Project-file Explorer” topic!

Unload patch file

Press Ctrl+U (or use the popup menu) if you want to unload a patch file from the highlighted position.

Rename patch

Press Ctrl+R (or use the popup menu) if you want to rename a patch at the highlighted position.
This function doesn t rename your patch file, only the patch definition within the file, since the actual patch name is stored inside the patch file.

Make default (for new parts)

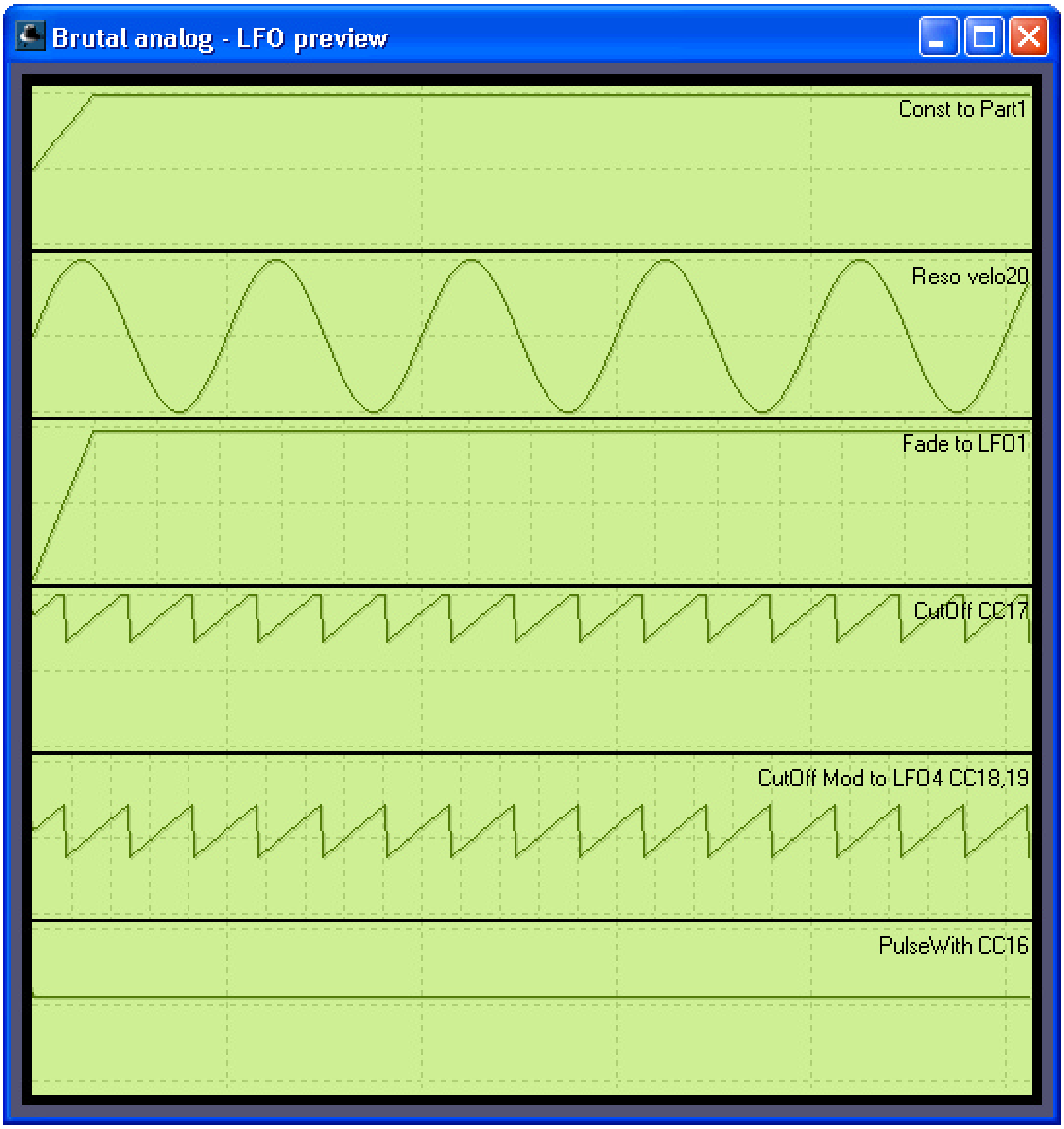
Press Ctrl+D (or use the popup menu) if you want to make the selected part become the default part definition. Once you ve made a part default, every new part you add to patches will be created to be the same as the one you selected to be the default.

For example: You usually start with setting the waveform to triangle when creating a new part. This step can be skipped. Add a new part to a patch; set its waveform to triangle; "Make default". From this time, every newly added part will look like this part, so you won t have to set their waveform to triangle one by one.

Reset default part to original

The factory-default part becomes your default part.

LFO preview window



Displays the LFO definitions within the selected patch. This window is resizable and doesn t have to be closed and opened for every patch. You can simply open it once and roll over the Patch tree / edit your patches and the LFO preview will be updated on the fly.

You can set up patches using other LFOs and/or CCs (controller changes) in their definitions. The preview is recursive, so you'll see the effect one LFO makes to the other(s) on the fly. The CC values used for displaying the previews are coming from the controller initialization definitions. (learn more at Init. Controllers button)

Export names to Cakewalk

Press Ctrl + W (or use the popup menu) if you want to export all of your custom patch names to Cakewalk.
It's very useful if you don't like to see the standard MIDI patch names displayed all over Cakewalk instead of the real HardSID MIDI names.

Parts in the patch tree

12 parts can be added to every patch.

Add new part

Double click on the [add new part] line if you want to add a new part to a patch's structure. (max. 12 parts can be added)

Deleting a part

Simply press the Delete key on a highlighted part that you want to remove from the patch's structure.

LFOs in the patch tree

8 LFOs can be added to every patch.

Add new LFO

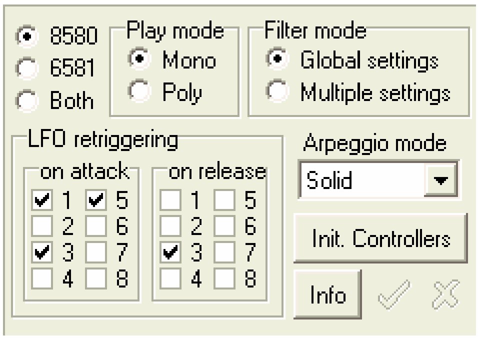
Double click on the [add new LFO] line if you want to add a new LFO to a patch's structure (max. 8 LFOs can be added).

Deleting a LFO

Simply press the Delete key on a highlighted LFO that you want to remove from the patch's structure.

Patch settings

You can view/edit the properties of the highlighted patch using this panel, which is situated under the patch structure tree.



● 8580
○ 6581
○ Both

Play mode
● Mono
○ Poly

Filter mode
● Global settings
○ Multiple settings

LFO retriggering

on attack
☑ 1 ☑ 5
☐ 2 ☐ 6
☑ 3 ☐ 7
☐ 4 ☐ 8

on release
☐ 1 ☐ 5
☐ 2 ☐ 6
☑ 3 ☐ 7
☐ 4 ☐ 8

Arpeggio mode
Solid

SID version selections

This patch property was invented for administrative purposes. It can make future patch database engine project developments easier.

For example: If we make a patch database for www.hardsid.com, and you want to find bass patches for your HardSID which has a SID 8580, it ll be very easy by selecting the SID type from a list in the search engine.

- **8580** (this patch sounds correctly on the 8580 only)
- **6581** (this patch sounds correctly on the 6581 only)
- **Both** (this patch sounds correctly on both 6581 and 8580 versions)

This setting doesn t alter the sound of the patch, but it s very important for the future. Please, use it correctly!

Play mode

- **Mono**: Monophonic mode. The HardSID MIDI driver will always use the first n SID voices from the channel when playing a new note (where n is the number of parts in the current patch).

- **Poly**: Polyphonic mode, the HardSID MIDI driver will allocate new SID voices n times (for every part) from the channel when playing a new note (where n is the number of parts in the current patch).

Filter mode

- **Global Settings**: Every part will use the same filter setting within the patch. (This is useful for when the parts will use the same SID, depending on the number of SID chips, and the channel setup)

- **Multiple Settings**: Every part s filter settings can be different: it s used for high performance HardSID systems with 2 or more SID chips.

LFO retriggering

Check all of the LFO numbers which you want to be retriggered on note attack/release.

Every patch's LFOs are numbered from 1 to 8.

Arpeggio mode

- **None**: The arpeggio function is disabled for this patch.

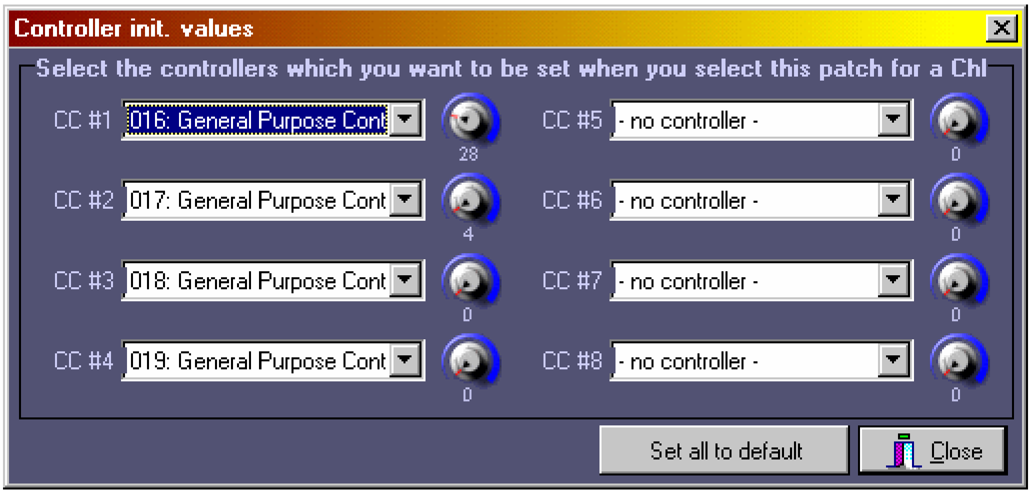
- **Additive**: Notes can be only added to the arpeggio. Even if a note releases, it won t be removed until all of the notes are released.

- **Solid**: Notes can be added and removed to/from the arpeggio any time.

Init. Controllers

Controller initialization means that if this patch will be selected for a MIDI channel (Patch change occurs), all of the controllers which you selected for initialization will be set to the specified value.

This is very useful for patches which can produce various sounds depending on CC (Controller Change) values.



Controller init. values

Select the controllers which you want to be set when you select this patch for a Chl

CC #1 016: General Purpose Cont 28

CC #2 017: General Purpose Cont 4

CC #3 018: General Purpose Cont 0

CC #4 019: General Purpose Cont 0

CC #5 - no controller - 0

CC #6 - no controller - 0

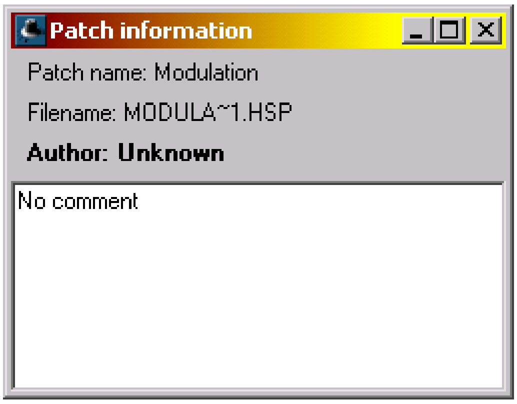
CC #7 - no controller - 0

CC #8 - no controller - 0

Info

This window displays/edits the information associated with the highlighted patch file.

If you create a new patch, you can enter some information which will be shown to other users when they load this patch into their patch bank.



Patch name: Modulation

Filename: MODULA~1.HSP

Author: Unknown

No comment

Save button (next by the Info button)

Press this button if you want to keep the editing you ve made to your patch.

Undo button (next by the Save button)

Press this button if you want to cancel the editing you ve made to you patch and return to the original state of your patch.

Part editor

This editor can be used for viewing/editing a part s properties. (You can use right-click on knobs which can select between a few distinct values, like: LFO selectors; LFO Combination selector; Filter/Resonance knob)

Meaning of before release / after release

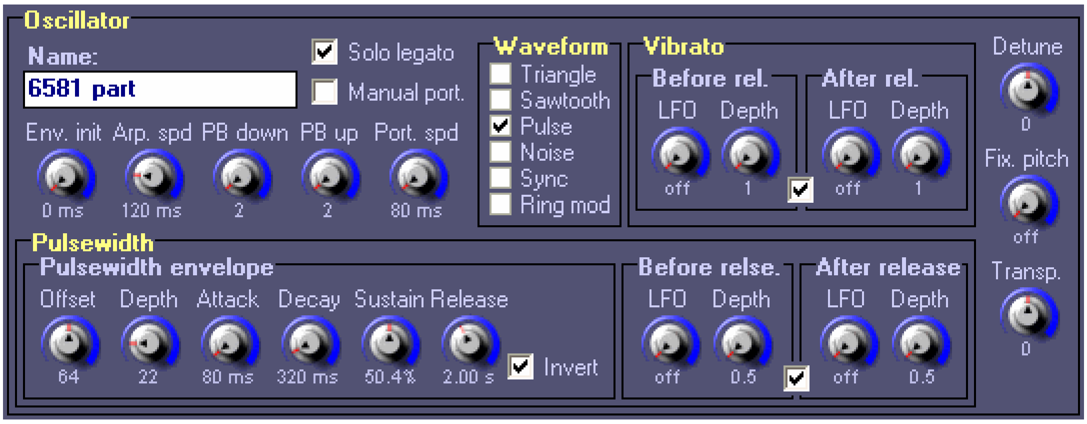
You can see the before release ' and after release ' captions on many knob groups, and other places.

- **Before release**: These settings will be used while the note/key is still held down.

- **After release**: These settings will be used after a note/key is released.

Oscillator

This group encapsulates the part s common properties and all of the settings which can define a SID oscillator s output.



Oscillator

Name: 6581 part

☑ Solo legato

□ Manual port.

Env. init 0 ms, Arp. spd 120 ms, PB down 2, PB up 2, Port. spd 80 ms

Waveform: □ Triangle □ Sawtooth ☑ Pulse □ Noise □ Sync □ Ring mod

Vibrato: Before rel. LFO off, Depth 1 ☑ After rel. LFO off, Depth 1

Detune 0

Fix. pitch off

Transp. 0

Pulsewidth

Pulsewidth envelope: Offset 64, Depth 22, Attack 80 ms, Decay 320 ms, Sustain 50.4%, Release 2.00 s ☑ Invert

Before relse. LFO off, Depth 0.5 ☑ After release LFO off, Depth 0.5

Common settings

Env. Init (ADSR envelope init. Time)

The volume envelope feature in the HardSID MIDI is based on the SID s (6581/8580) hardware ADSR (attack, decay, sustain, release) feature. This feature in the SID has a strange bug.
When you ll start creating patches, you ll probably notice that some parts' volume envelopes won t be stable at the beginning. You can fix this by setting the Env. Init to a higher value (20ms can solve this problem usually).

If a part sounds perfectly with the lowest setting, don t use a higher value, because this bug fix feature causes higher latency.

Solo legato

When the Solo Legato option is selected for a part, envelopes (ADSR, Filter, etc...), LFOs and some other parameters won t restart for a note which is started while the previous one is still held on the same channel.
This feature is used for smooth changes between notes instead of hardly restarting sounds.

* For MONO Patches only!

Port. spd (Portamento speed)

Specifies the time while the frequency of the last played note fades into the frequency of the actually starting note. When it is set to OFF, the portamento feature is disabled for the part.

The portamento feature is a very nice solo feature.

* For MONO Patches only!

Manual port. (Manual portamento)

When the Manual portamento is selected for a part, the portamento feature will be activated only for notes which are started while the previous note is still held on the same channel.

* For MONO Patches only! (with specified portamento speed)

Arp. Spd (Arpeggio update time)

Specifies the arpeggio update time (for patches which are using arpeggio).

Arpeggio update time: When the arpeggio update time elapses, the arpeggio engine takes the next active note from the arpeggio list.

PB down (Pitch bender - down)

Specifies the number of semitones which will be subtracted from the played note's semitone value when the Pitch bender is at its lowest position.

PB up (Pitch bender – up)

Specifies the number of semitones which will be added to the played note's semitone value when the Pitch bender is at its highest position.

Detune

Specifies the oscillator detune value.

- **Position = 0**: the oscillator is **not detuned**
- **Position = 63**: the oscillator is **detuned** by a whole **semitone (up)**
- **Position = -64**: the oscillator is **detuned** by a whole **semitone (down)**

Fix. Pitch (Fixed note pitch)

Specifies fixed semitone value of the part if it's set to a position other than Off.

Transp. (Transpose)

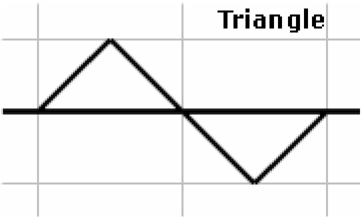
Specifies the amount of semitones which will be added to the played note's semitone value.

Waveform

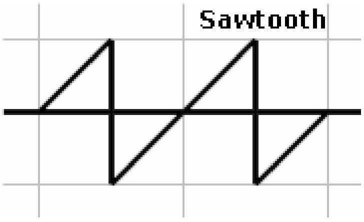
Specifies the oscillator's waveform, and the combination with another oscillator.

The following basic waveforms are available:

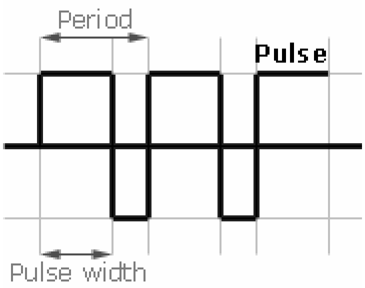
Triangle: A very smooth waveform, typically used for flute and whistle sounds.



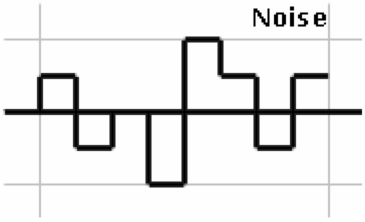
Sawtooth: A very sharp waveform, typically used for trumpet-like sounds.



Pulse: This waveform is very interesting, because its sound is variable using the pulse width value (oscillator group \ pulsewidth). Setting the pulse width to its center position results in a clear 50% square waveform, which was used, for example, in the Atari 8-bit computers. If you want a very thin sound, you can set it near the maximum or minimum value.



Noise: A random waveform, which is widely used for special effects, like drums, winds, and other interesting noises.



You can select more waveforms. The valid combinations depend on the SID version. The **6581 doesn't really support the mixed waveforms**.

There are many valid combinations for the **8580**. The only rule is that you **can't combine the Noise waveform** with any other waveform. All of the **other combinations are valid**.

Sync: Synchronizes this part's oscillator to the previous part's oscillator output. The following cases can happen, since a SID chip has only three oscillators:

1. #2 is synched to #1
2. #3 is synched to #2
3. #1 is synched to #3

What it means is when the synchronizer oscillator's value crosses zero (0), this part's oscillator restarts from the beginning.

Ringmod: Ring-modulates this part’s oscillator value with the previous part’s oscillator output (like described before).

What it mean is that the part’s oscillator output will be the sum and difference of this oscillator’s and the synchronizer oscillator’s value.

Vibrato

You can assign the output of an LFO to modulate the actual oscillator frequency value.

LFO

Specifies the LFO which will modulate the oscillator frequency.

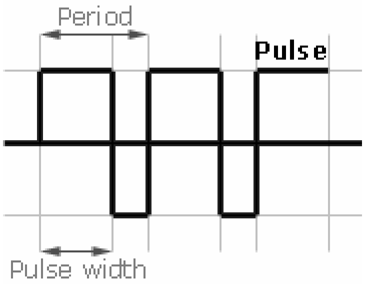
Depth

Specifies the multiplier factor for the assigned LFO.

The LFO’s output value will be multiplied by this number before added to the oscillator frequency.

PulseWidth

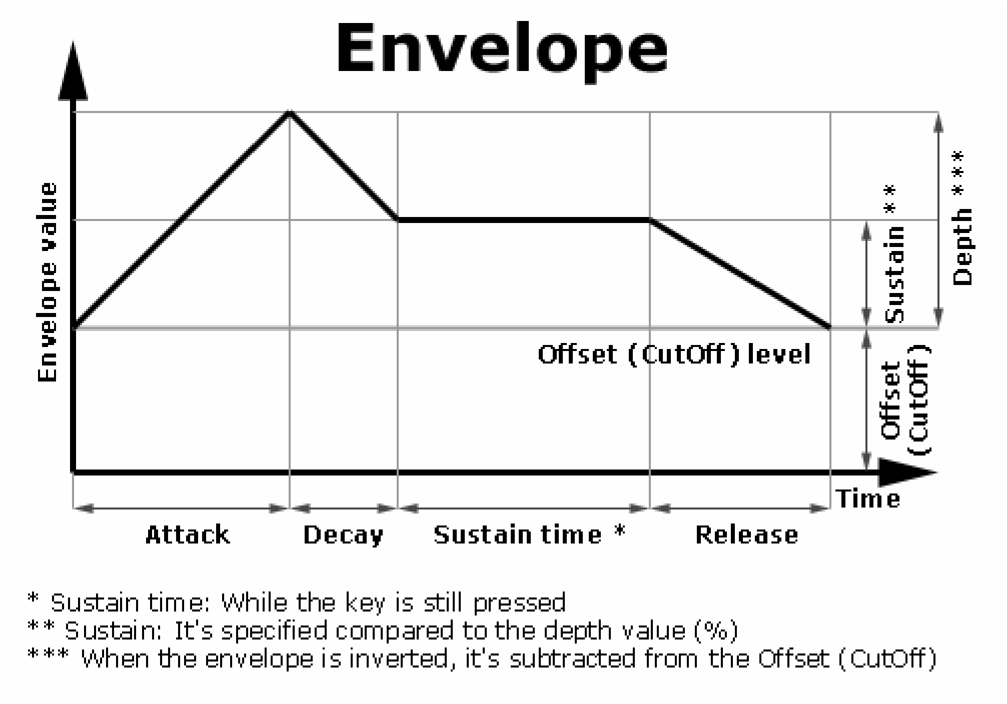
This feature sets the pulse width when the Pulse waveform is selected for the oscillator.



PulseWidth envelope

You can set up an envelope for the oscillator’s pulse width.

When you set the Depth to zero (0), the envelope becomes a static pulse width value which is specified by the offset value.



* Sustain time: While the key is still pressed
** Sustain: It's specified compared to the depth value (%)
*** When the envelope is inverted, it's subtracted from the Offset (CutOff)

PulseWidth LFO settings

You can assign the output of an LFO to modulate the current pulsewidth value.

LFO

Specifies the LFO which will modulate the pulsewidth value.

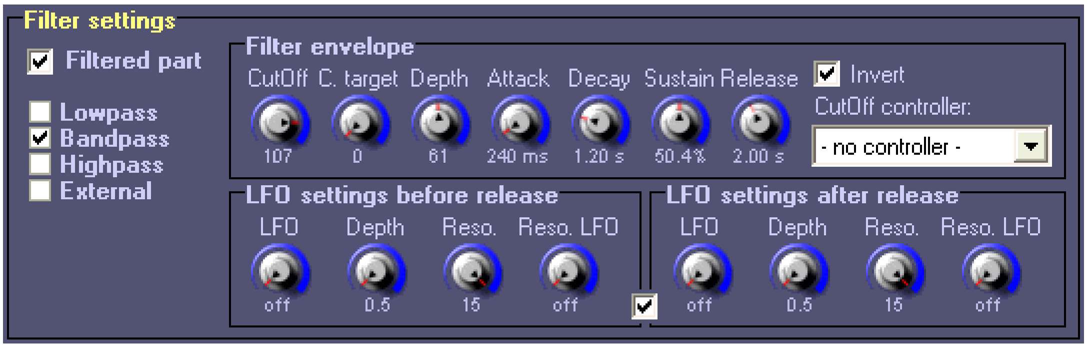
Depth

Specifies the multiplier factor for the assigned LFO.

The LFO’s output value will be multiplied by this number before added to the pulsewidth value.

Filter settings

The Filter settings group specifies all of a part’s filter settings.



Filter settings

☑ Filtered part

☐ Lowpass
☑ Bandpass
☐ Highpass
☐ External

Filter envelope

CutOff	C. target	Depth	Attack	Decay	Sustain	Release
107	0	61	240 ms	1.20 s	50.4%	2.00 s

☑ Invert

CutOff controller: - no controller -

LFO settings before release

LFO	Depth	Reso.	Reso. LFO
off	0.5	15	off

☑

LFO settings after release

LFO	Depth	Reso.	Reso. LFO
off	0.5	15	off

Common settings

Filtered part

Specifies whether the part is filtered or not.

Filter mode

Specifies the SID s filtering mode for this part.

Lowpass: Passes only those frequencies which are lower than the actual filter cutoff value.

Bandpass: Passes only those frequencies that are around the actual filter cutoff value.

Highpass: Passes only those frequencies which are higher than the actual filter cutoff value.

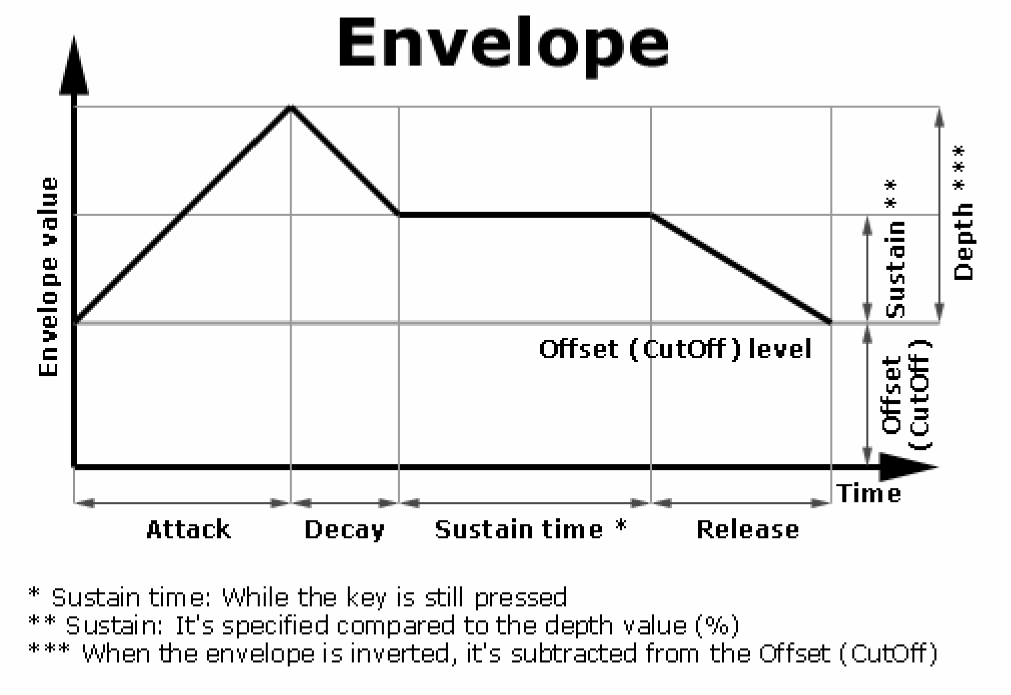
External: Enables filtering on the SID s external audio-in line.

Important note: If you ll play more parts on the same SID, you have to select the global filter settings option in the patch settings! If you try to use different filter settings on the same SID chip at the same time, it ll result in a random-like filter handling.

Filter envelope

You can set up an envelope for the filter.

When you set the Depth to zero (0), the envelope becomes a static filter value which is specified by the CutOff value.



* Sustain time: While the key is still pressed
** Sustain: It's specified compared to the depth value (%)
*** When the envelope is inverted, it's subtracted from the Offset (CutOff)

C. target (Cutoff target)

Specifies a second CutOff value which can be reached by sending a CutOff controller value 127 to the MIDI channel.

Cutoff controller

Specifies the CutOff controller, which can set the actual filter CutOff value between the original CutOff and the CutOff target value in 128 steps. (0..127)

To understand this, take a look at the Filter Envelope diagram’s OffSet (CutOff) level axis. This axis can be moved from the original value to the target value using the CutOff controller.

Filter LFO settings

You can assign the output of an LFO to modulate the current filter value.

LFO

Specifies the LFO which will modulate the filter value.

Depth

Specifies the multiplier factor for the assigned LFO.

The LFO’s output value will be multiplied by this number before added to the filter value.

Reso. (Filter Resonance)

Specifies the amount of resonance for the SID’s hardware filter.

The resonance interval is 0..15, so it isn t a smooth SID feature.

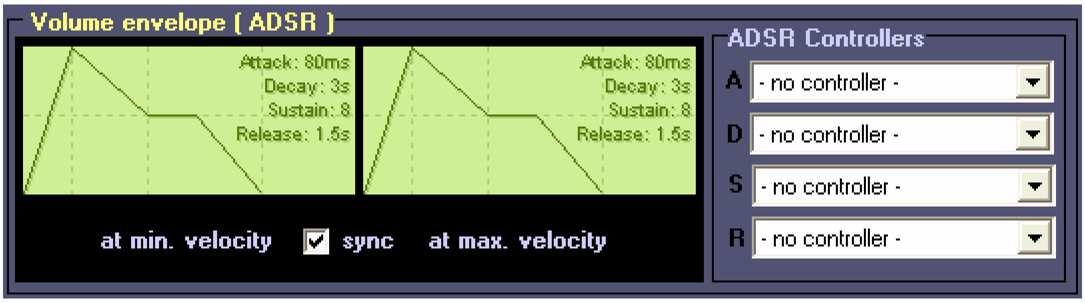
Reso. LFO (Filter Resonance LFO)

You can assign the output of an LFO to the current filter resonance value.

Note: If you assign an LFO to this property, it overrides the Reso. knob’s setting.

Volume envelope (ADSR)

This group lets you set the part’s volume envelope. This is called ADSR in the SID terminology (attack, decay, sustain, release).



Volume envelope (ADSR)

Attack: 80ms
Decay: 3s
Sustain: 8
Release: 1.5s

Attack: 80ms
Decay: 3s
Sustain: 8
Release: 1.5s

at min. velocity ☑ sync at max. velocity

ADSR Controllers

A - no controller -
D - no controller -
S - no controller -
R - no controller -

Attack

Specifies how fast/slow the volume will reach the maximum level.

Decay

Specifies how fast/slow the volume will drop back to the sustain level.

Sustain

Specifies the sustain level.

The volume envelope will stay at this level while the key is still pressed (until the release state).

Release

Specifies how fast/slow the volume will drop back to zero (0) after leaving the sustain level.

How to set the individual values

Move the cursor over any of the bright dash-lines, and the cursor shape becomes a resizer tool. Now you can simply drag this line and move it in 16 steps to another position.

At min velocity / At max velocity

There are two equivalent ADSR editors side by side. You can specify an ADSR for the case when the key velocity is the lowest (0), and another one for the case when the key velocity is the highest (127).

The HardSID MIDI driver will interpolate every individual parameter (A, D, S and R) between the two specified values in 128 steps (0..127), depending on the actual key velocity value, or the assigned ADSR controllers.

Sync checkbox

It s not a run-time parameter. This checkbox makes the ADSR editing easier when you don t want to specify two different ADSR envelopes. If you want the max. Velocity synchronized automatically to the min. Velocity right when you adjust the min. Velocity, just check this checkbox. (This is checked by default, i.e. both envelopes are edited together.)

ADSR Controllers

Specifies the MIDI controllers for the A, D, S and R parameters of the volume envelope.

It overrides the actual key velocity when assigned. This way you can change each ADSR parameter s interpolation between the min. and max. value individually from a MIDI sequencer.

Table editor

What is the SID table editor

The SID table editor isn t an easy-to-understand feature for most musicians. Using this table requires a lot of SID programming experience.

What is this editor? There are many wonderful SID tunes which were written on the C64. Those tunes are using SID value sequencing for generating interesting drums and other special effects which can t be done just by adjusting some parameters. For example, a drum table plays white noises then pulse waveforms alternately with different filter parameters at very high speed.

Musicians will use the HardSID mainly for producing cool analog sounds, not for generating drums, because there are many great hardware and software samplers which can play real drum sounds.

Entering values

The following topics will show you exactly what you can enter into the cells of the table.

If you don t fill a cell, it ll inherit the actual value from the part definition.

Speed

Specifies the speed of the actual table step (row).

This value divides the HSMIDI system clock. For example, if the system clock is 200Hz, then speed 1 means that this step will be 5 milliseconds long. Speed 2 means that this step will be 10 milliseconds long, etc..

StepTime(millisecs) = 1000/HSSystemClockInHz * SpeedValue

If you leave this cell empty and other columns in the same row are filled, the speed will be 1.

Waveform

Specifies the waveform of the actual step.

You can enter these characters into this cell:

- **t**: Triangle waveform
- **s**: Sawtooth waveform
- **p**: Pulse waveform
- **n**: Noise waveform

Gate

Specifies whether the Gate is enabled for this step. (When the Gate is not set, the volume envelope stays at the sustain level.)

You can enter YES or NO into this cell.

Ringmod

Enables or disables the oscillator ring modulation for this step.

You can enter YES or NO into this cell.

Sync

Enables or disables the oscillator synchronization for this step.

You can enter YES or NO into this cell.

Test

Enables or disables the Test bit for this step.

This is a very special bit. It was invented to initialize the oscillator generator when it hangs (the oscillator in the 6581 could hang when the noise waveform was selected together with another waveform).

You can enter YES or NO into this cell.

FiltMode

Specifies the filtering mode for this step.

The following characters can be entered into this cell:

- **l**: Lowpass
- **b**: Bandpass
- **h**: Highpass
- **x**: External filtering

CutOff

Specifies the filter cutoff value for this step.

Valid values: 0..254

PulWth

Specifies the pulse width value for this step.

Valid values: 0..254

Pitch

Specifies the fixed pitch OR the transpose value for this step.

Valid **transpose** values: **-64..+63**

Valid **fixed pitch** values: **0..126**

Loop back to step

The table can be looped back to any step.

If you enter zero (0), the table ends at its last value, and the sound continues with the actual part settings.

Hold gate on table

Specifies whether the default Gate handling is enabled or not.

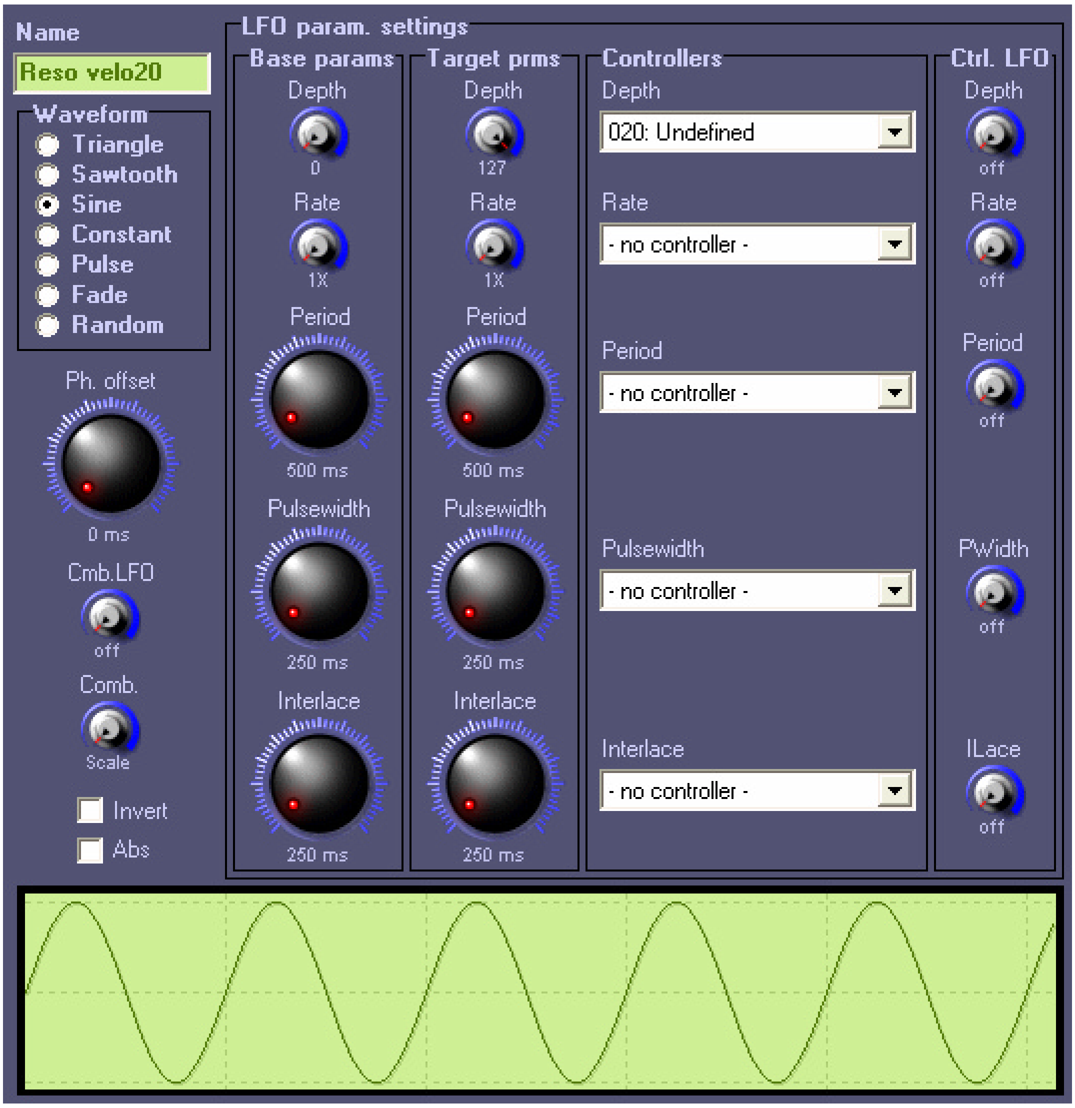
For example: If you created a drum voice, you don t want the driver to hold the ADSR sustain level while the key is pressed.

Modify button

If you want your settings to be entered into the part’s definition, press this button!

LFO editor

You can edit LFOs using the built-in LFO editor of the HardSID MIDI. (You can use right-click on knobs which can select between a few distinct values, like: LFO selectors; LFO Combination selector; Filter/Resonance knob)



Name: Reso velo20

Waveform
○ Triangle
○ Sawtooth
● Sine
○ Constant
○ Pulse
○ Fade
○ Random

Ph. offset: 0 ms
Cmb.LFO: off
Comb.: Scale
☐ Invert
☐ Abs

LFO param. settings

	Base params	Target prms	Controllers	Ctrl. LFO
Depth	0	127	020: Undefined	off
Rate	1X	1X	- no controller -	off
Period	500 ms	500 ms	- no controller -	off
Pulsewidth	250 ms	250 ms	- no controller -	off
Interlace	250 ms	250 ms	- no controller -	off

Base params (group)

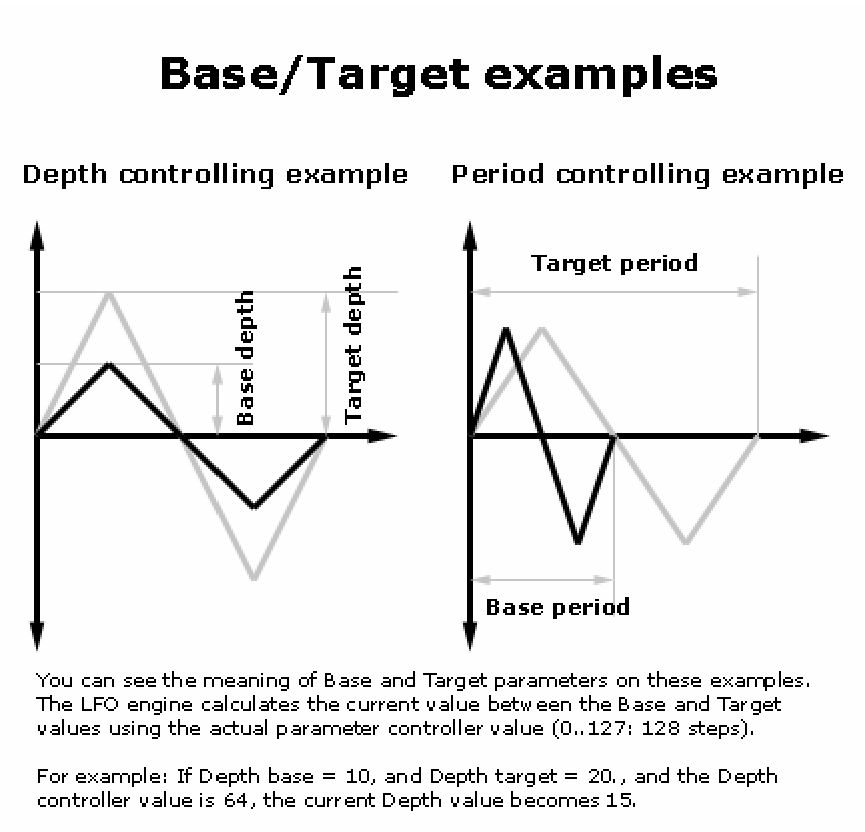
These are the main parameters of the LFO.

Target params (group)

These are counterparts of the Base parameters.

They are used when there are parameter controllers assigned to the LFO. Parameter controllers can be MIDI Controllers (Controller group) or Controller LFOs (Ctrl. LFO group).

How does it work exactly:



You can see the meaning of Base and Target parameters on these examples. The LFO engine calculates the current value between the Base and Target values using the actual parameter controller value (0..127: 128 steps).

For example: If Depth base = 10, and Depth target = 20., and the Depth controller value is 64, the current Depth value becomes 15.

Controllers (group)

You can assign MIDI Controllers to the LFO parameters.

If this controller changes, the LFO's actual parameter will change to a calculated value between the Base and Target values (see the Base/Target examples in the Target param help topic).

Ctrl. LFO (Control LFO group)

If you assign a Control LFO to a LFO parameter, the values of the control LFO will be handled like the previously described MIDI controllers (Controllers help topic).

These parameters will override the Controllers group's settings.

Common settings

Name

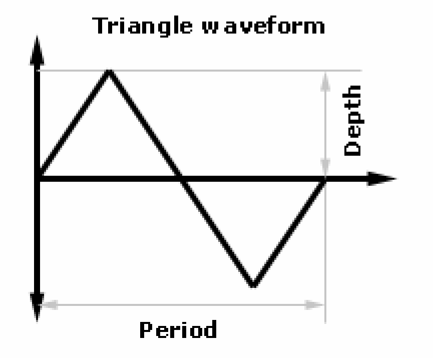
This is the name of the LFO.

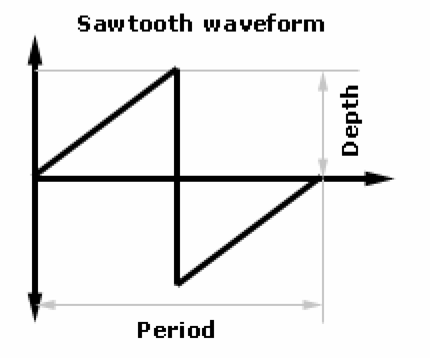
You can see this name in the patch structure on the left side of the editor.

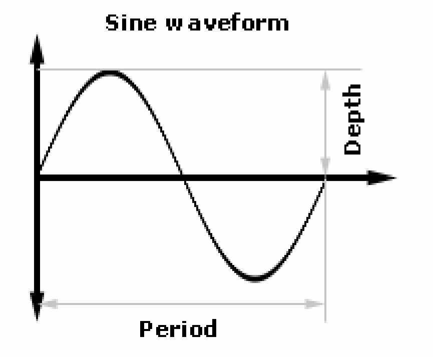
Waveform

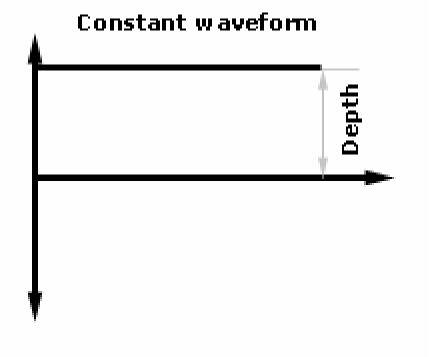
This is probably the most important property of the LFO.

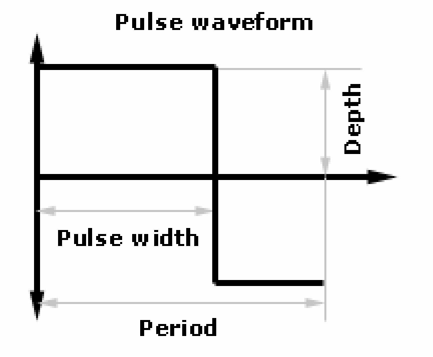
It’s basically the same as a SID oscillator’s waveform, but an LFO has more waveforms.

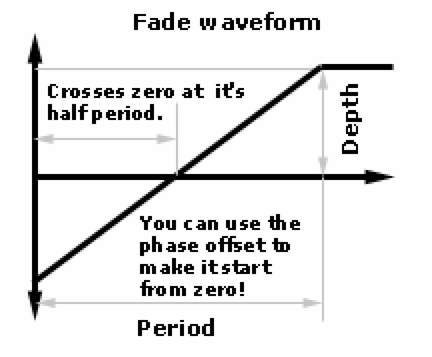


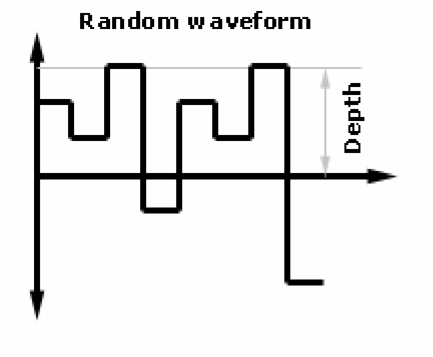




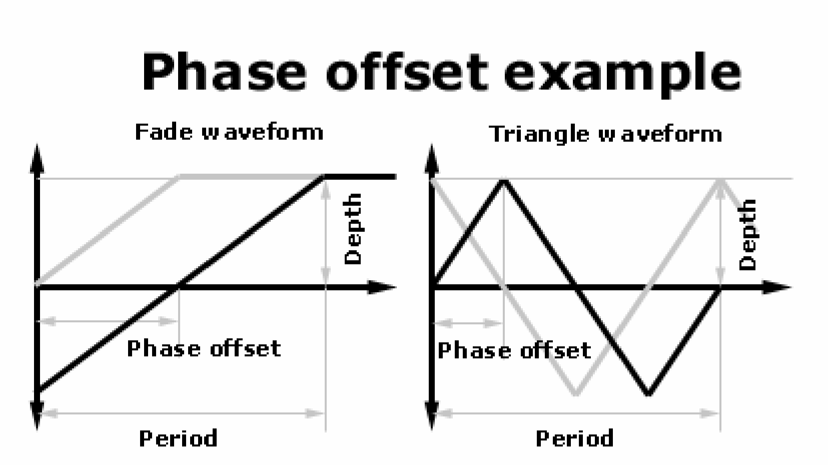





Fade waveform
Crosses zero at it's half period.
Depth
You can use the phase offset to make it start from zero!
Period



Ph. Offset (phase offset)

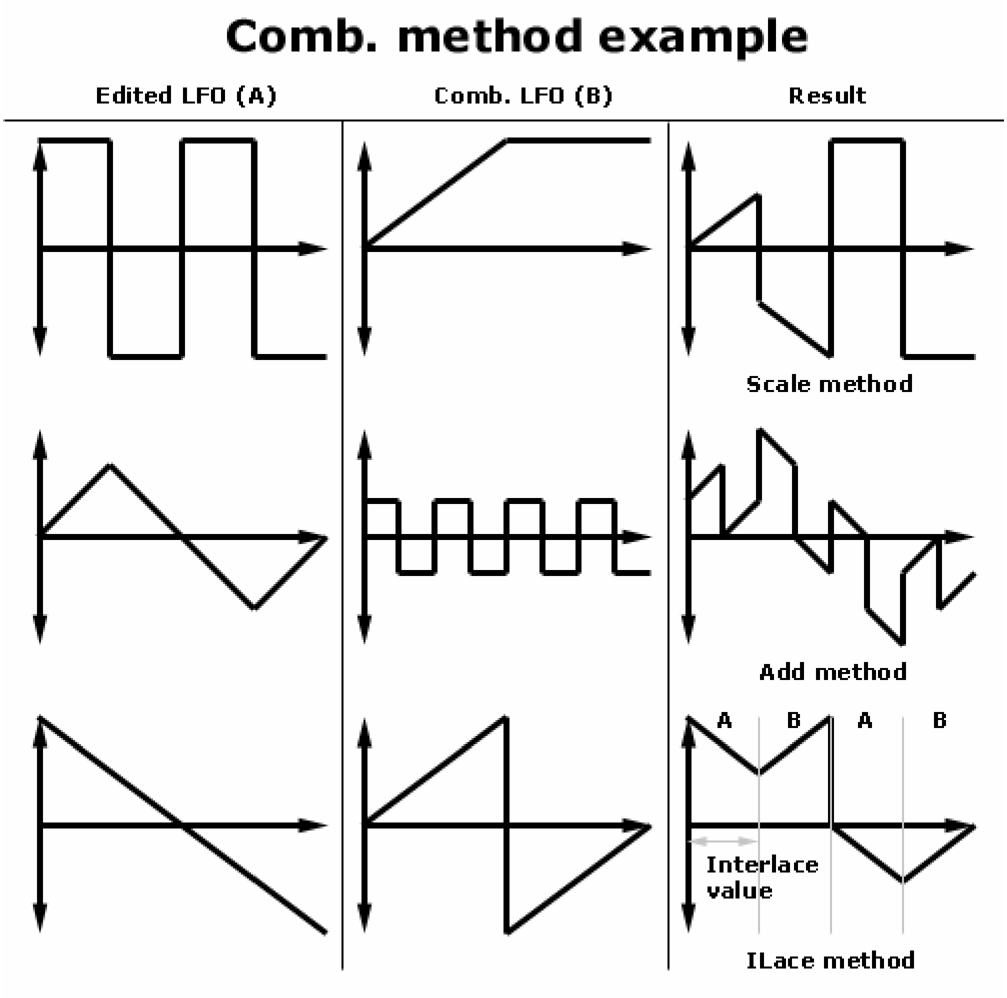


Cmb. LFO (combine with LFO)

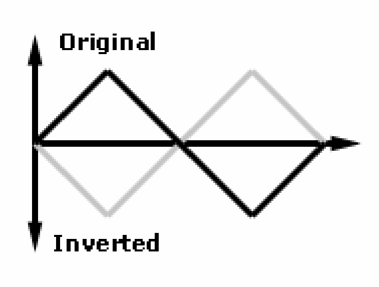
You can combine the LFO with another LFO (1..8) within the same patch. To understand this, see the Comb. (LFO combination method) topic!

Comb. (LFO combination method)

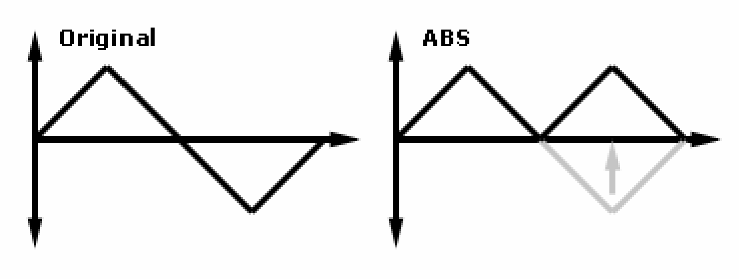
Specifies the LFO combination method, when a Cmb. LFO is assigned.



Invert



Abs (absolute value)



Params

Depth

Specifies the LFO's depth.

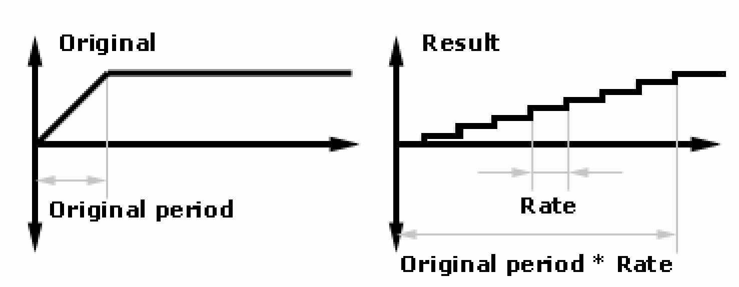
See the LFO waveform topic!

Rate

Specifies the LFO's Rate.

The result contains the same amount of LFO data as the original one, but every data is repeated Rate times.

This means that the new period will be the original period * Rate.



Period

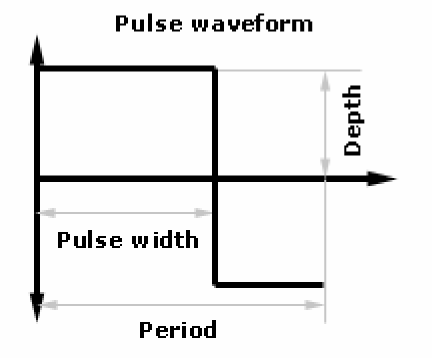
Specifies the LFO's period.

See the LFO waveform topic!

Pulsewidth (for Pulse LFO only!)

Specifies the pulse width of the pulse waveform.

The square waveform is a pulse waveform with 50% pulse width. (PulseWidth * 2 = Period)



Interlace (for the interlace Comb. Method)

Specifies the interlace period of the ILace combination method.

See the Comb. (LFO combination method) topic!

Projects

HardSID MIDI Projects are introduced in HardSID MIDI v1.2

HardSID Projects are very useful for:

- Publishing HardSID MIDI songs easily always with the proper Patch bank/Channel Setup (publish your MIDI music files always together with the related .hrp file for the song)
- Exchanging full projects/patch banks between HardSID MIDI Users (go to http://www.hardsid.com and click on the HardSID MIDI Exchange link!)
- Archiving your own patch banks/channel setups
- Composing multiple songs for different Patch Banks/Channel Setups (you can easily export and import projects)

Every HardSID MIDI Project consists of:

- A Patch bank
- The full Channel Setup used in the project
- The System Clock setting for the project (200Hz by default)
- Optional description from the author (README)

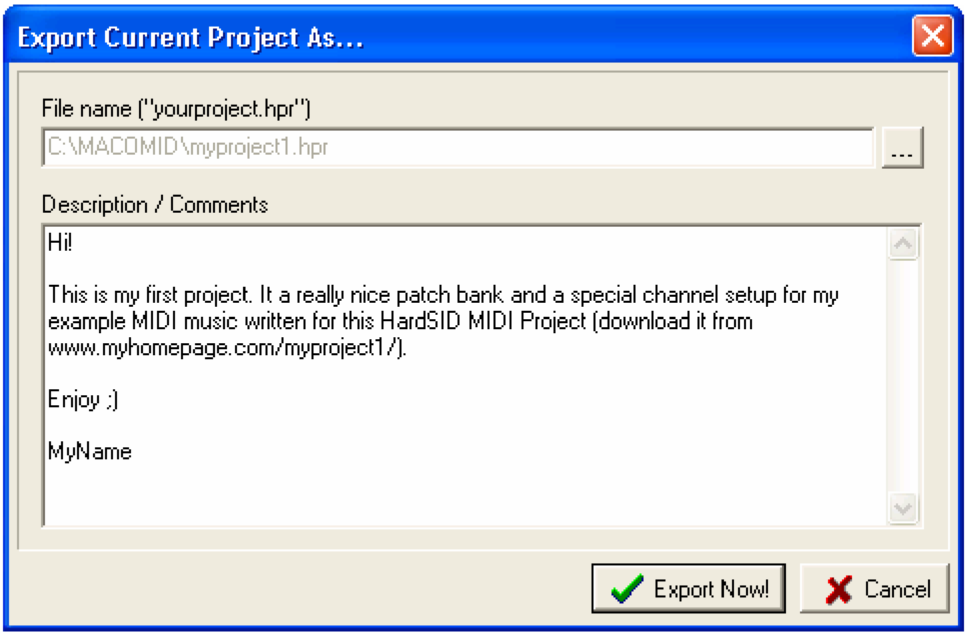
Facts:

- The extension of every HardSID MIDI Project is "hrp" (yourproject.hrp)
- The size of a HardSID MIDI Project is very small and depends on the number of patches it contains. (2kbytes – 50kbytes)

Exporting Projects

Menu: Project\Export Current Project As...

Set the target filename of your project and write some description if you wish (optional), then press the "Export Now!" button.



File name ("yourproject.hpr")

C:\MACOMID\myproject1.hpr

Description / Comments

Hi!

This is my first project. It a really nice patch bank and a special channel setup for my example MIDI music written for this HardSID MIDI Project (download it from www.myhomepage.com/myproject1/).

Enjoy :)

MyName

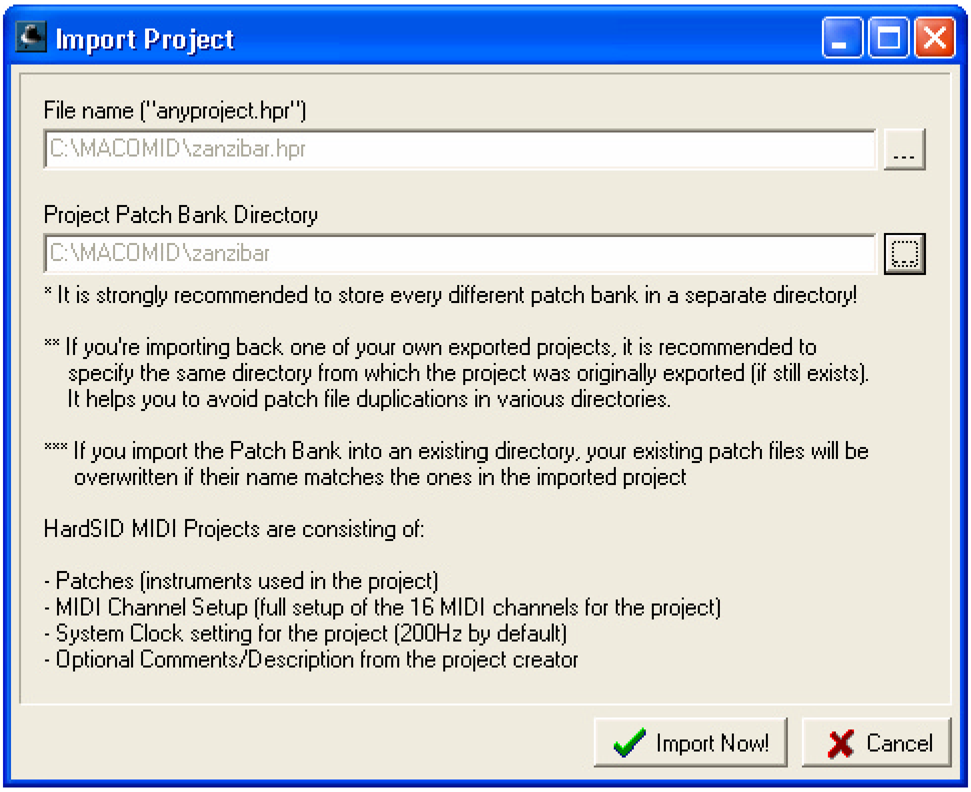
We d like to invite you to the HardSID MIDI Exchange Community at http://www.hardsid.com . You can upload your own creations (full projects, single patches, MIDI songs, MP3s) and download other people s work!

Importing Projects

Menu: Project\Import Project

First, you ll be warned that all of your current settings will be overwritten. You ll have the option to export your current project before proceeding with the import.

Select the project file you wish to import, then select the destination directory of the project. Please read the recommendations on the Import window:



File name ("anyproject.hpr")
C:\MACOMID\zanzibar.hpr

Project Patch Bank Directory
C:\MACOMID\zanzibar

* It is strongly recommended to store every different patch bank in a separate directory!

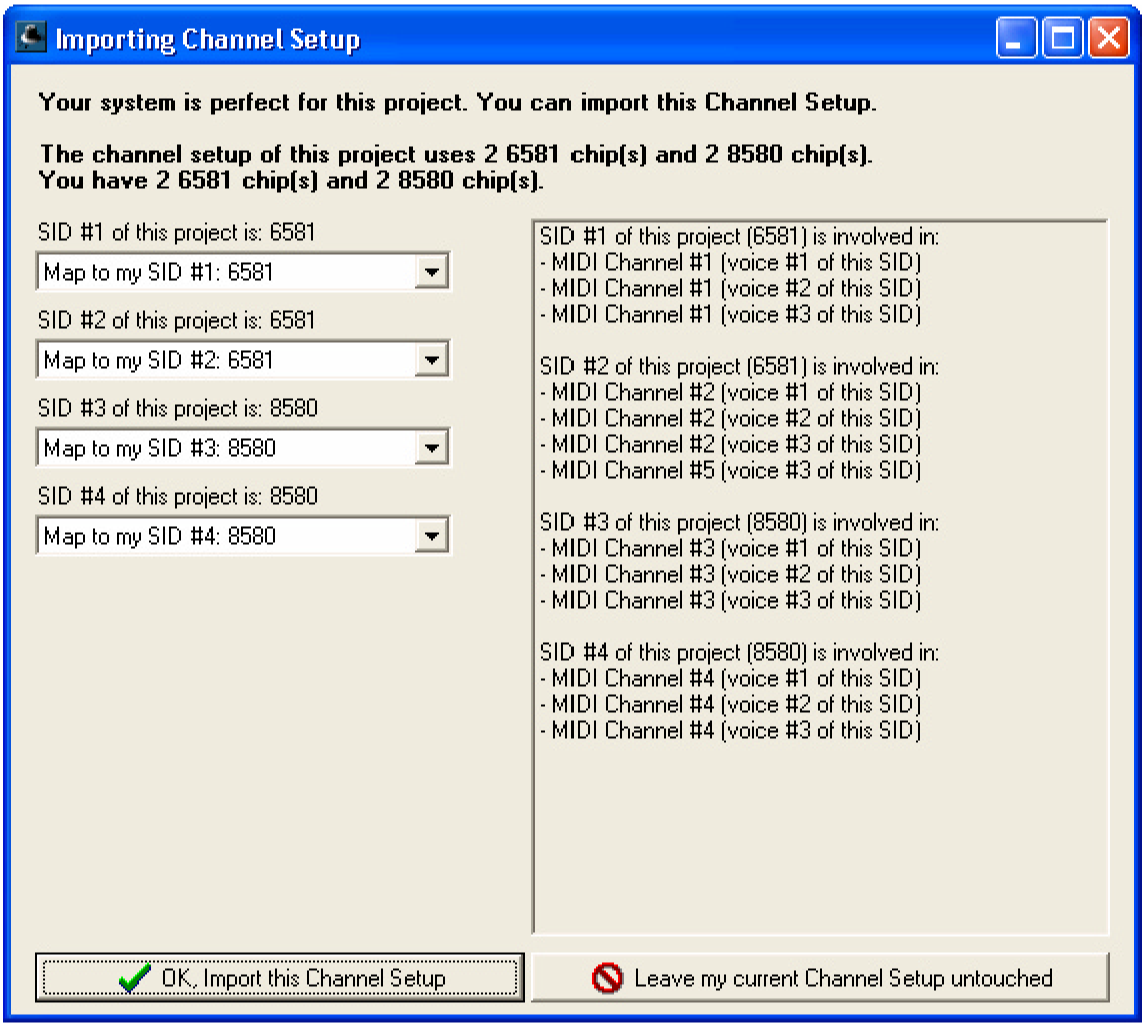
** If you're importing back one of your own exported projects, it is recommended to specify the same directory from which the project was originally exported (if still exists). It helps you to avoid patch file duplications in various directories.

*** If you import the Patch Bank into an existing directory, your existing patch files will be overwritten if their name matches the ones in the imported project

HardSID MIDI Projects are consisting of:

- Patches (instruments used in the project)
- MIDI Channel Setup (full setup of the 16 MIDI channels for the project)
- System Clock setting for the project (200Hz by default)
- Optional Comments/Description from the project creator

When you're ready, press the "Import Now!" button and an "Importing Channel Setup" window will appear:



Your system is perfect for this project. You can import this Channel Setup.

The channel setup of this project uses 2 6581 chip(s) and 2 8580 chip(s).
You have 2 6581 chip(s) and 2 8580 chip(s).

SID #1 of this project is: 6581
Map to my SID #1: 6581

SID #2 of this project is: 6581
Map to my SID #2: 6581

SID #3 of this project is: 8580
Map to my SID #3: 8580

SID #4 of this project is: 8580
Map to my SID #4: 8580

SID #1 of this project (6581) is involved in:
- MIDI Channel #1 (voice #1 of this SID)
- MIDI Channel #1 (voice #2 of this SID)
- MIDI Channel #1 (voice #3 of this SID)

SID #2 of this project (6581) is involved in:
- MIDI Channel #2 (voice #1 of this SID)
- MIDI Channel #2 (voice #2 of this SID)
- MIDI Channel #2 (voice #3 of this SID)
- MIDI Channel #5 (voice #3 of this SID)

SID #3 of this project (8580) is involved in:
- MIDI Channel #3 (voice #1 of this SID)
- MIDI Channel #3 (voice #2 of this SID)
- MIDI Channel #3 (voice #3 of this SID)

SID #4 of this project (8580) is involved in:
- MIDI Channel #4 (voice #1 of this SID)
- MIDI Channel #4 (voice #2 of this SID)
- MIDI Channel #4 (voice #3 of this SID)

✓ OK, Import this Channel Setup
Leave my current Channel Setup untouched

You may want to import the project because:

- You only want a nice patch bank
- You want to play a HardSID MIDI music written by someone and you need to import the hpr related to this music

In the first case, **if you only want to import some cool patches, you don t really need to import the channel setup.** You can press the "Leave my current Channel Setup untouched" button if you wish.

BUT: **If you want to play a HardSID MIDI music which is written for this HardSID MIDI Project, you ll need to import the channel setup too.**

Since lots of different HardSID systems can exist, there is no guarantee that every project will work on your local system. The more SIDs and SID versions you have onboard, the more projects will work perfectly on your system.

For example: If someone writes a music which uses a 6581 chip and a 8580 chip and exports the related HardSID MIDI Project for it, you ll need at least a 6581 and a 8580 chip for the Project to play the music correctly. Of course you can import the project into your system even if you only have one SID chip, but you ll only have a nice patch bank, you won t be able to play music written for this HardSID MIDI Project.

The Import tool will display very useful information about the relation of the project s requirements and your own system.

1. If you have enough SID chips for this project and you have all the required SID versions (6581 and 8580 chip(s)) for the project, it will set up everything correctly and you can simply press the "OK… " button.

2. If you have enough SID chips, but you don t have all the required SID versions, it will set up everything the best way it finds. Review the automatic settings in this case.

3. If you don t have enough SID chips for the project, it ll set up the SID mappings partly. You ll then have the chance to review the mapping and override it if you like.

In the case if you want/have to review/override the automatic SID mapping, look at the right side of the window to find out which SID is involved in which MIDI channels in the original setup. It helps you decide which is the less important SID in this project, etc…

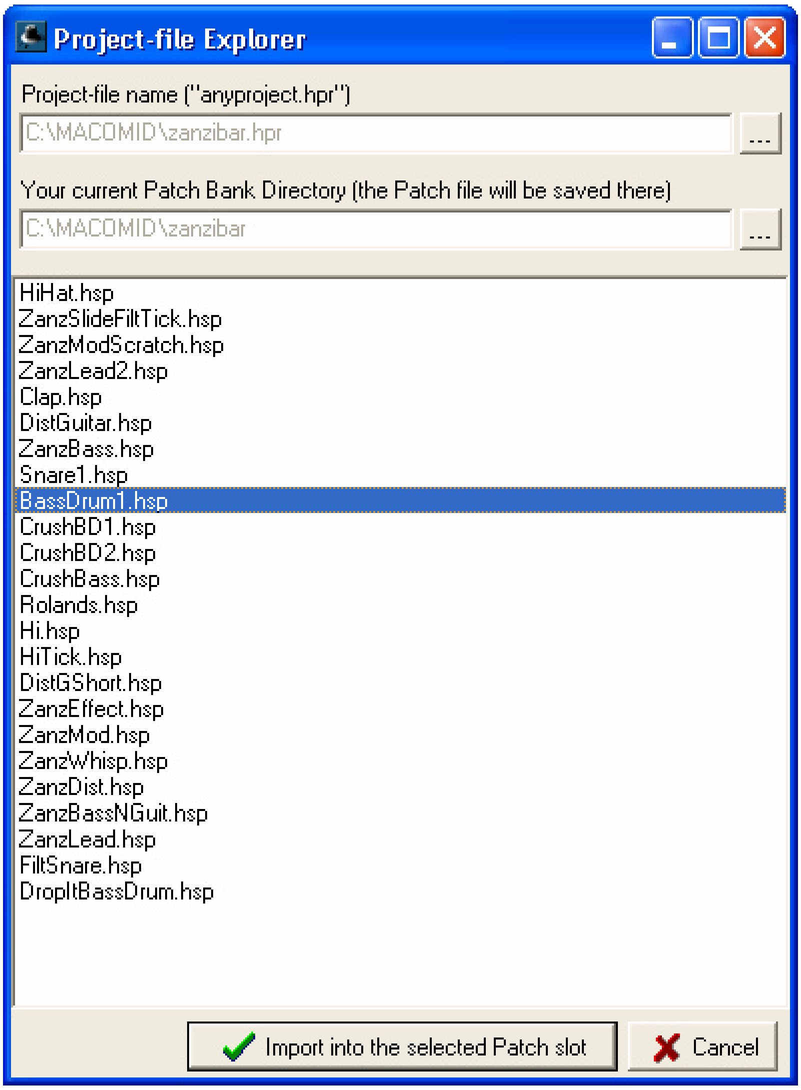
If there is any description by the author of the project, it will be displayed when the import is ready. You can also read the possible description before the import using the Project-file Explorer.

Project-file Explorer

Menu: Project\Project-file Explorer

You can use it for:

- Importing single patch files into your existing patch bank without importing the whole project (for example: if you quickly need some drum patches from one of your archived projects, you can simply open it with this tool and import the drums you wanted)
- Reading the possible README.TXT in the project without importing the project (double-click on the README.TXT file if you see any)



Project-file Explorer

Project-file name ("anyproject.hpr")

C:\MACOMID\zanzibar.hpr

Your current Patch Bank Directory (the Patch file will be saved there)

C:\MACOMID\zanzibar

HiHat.hsp
ZanzSlideFiltTick.hsp
ZanzModScratch.hsp
ZanzLead2.hsp
Clap.hsp
DistGuitar.hsp
ZanzBass.hsp
Snare1.hsp
BassDrum1.hsp
CrushBD1.hsp
CrushBD2.hsp
CrushBass.hsp
Rolands.hsp
Hi.hsp
HiTick.hsp
DistGShort.hsp
ZanzEffect.hsp
ZanzMod.hsp
ZanzWhisp.hsp
ZanzDist.hsp
ZanzBassNGuit.hsp
ZanzLead.hsp
FiltSnare.hsp
DropItBassDrum.hsp

Importing a single patch file into your existing patch bank:

1. Set the source file name and the patch directory to save this single patch file to
2. Open the Patch Editor (if not opened yet) and select the patch slot you wish to import the patch to (for example click on the first empty patch slot)
3. Click the "Import into the selected Patch slot" button

You can leave this window opened if you think you ll need to import any more patches from this project.

C64-to-Patch conversion

C64-to-Patch conversion is introduced in HardSID MIDI v1.2

This is probably the most inspiring development in the history of SID related MIDI. If you're one of those people who always wondered how were those cool drums/ effects/basses/guitars and other powerful instruments made in the C64 tunes/games, you'll love this topic.

Before HardSID MIDI v1.2 the only tool for making nice sounds was the Patch Editor with knobs/LFOs and a mysterious table editor, which wasn't something you could use very well. The table editor originates from the good old C64 times when there weren't LFOs and such modern high-resolution things. Music composers were in half programmers who made most of their drums/tricks by entering numeric values into a table (pitch, waveform, cutoff, etc…). Learning this kind of sound programming today is almost impossible, but the SID can be used only in a very limited way without such knowledge. Unbreakable limitations are killing the inspiration of most of the people, since it gets very boring to get always the same types of sounds.

So, **there was a huge gap between the real cool C64 sound effects and any kind of SID related MIDI environments (including hardware and software SID MIDI synthesizers)**.

Now, this huge gap has been reduced to a thin line by HardSID MIDI v1.2. From now, all the tricks can be revealed easily and you can even **make native C64 sound conversion to HardSID MIDI Patch conversion by some clicks with your mouse**. For example, you can **create a whole set of real kick-ass C64 drums in some minutes**. Just listen to your favorite C64 tunes, make your choice and grab the sounds you want!

Check out our "Mechanicus Distortion Guitar" patch tutorial:

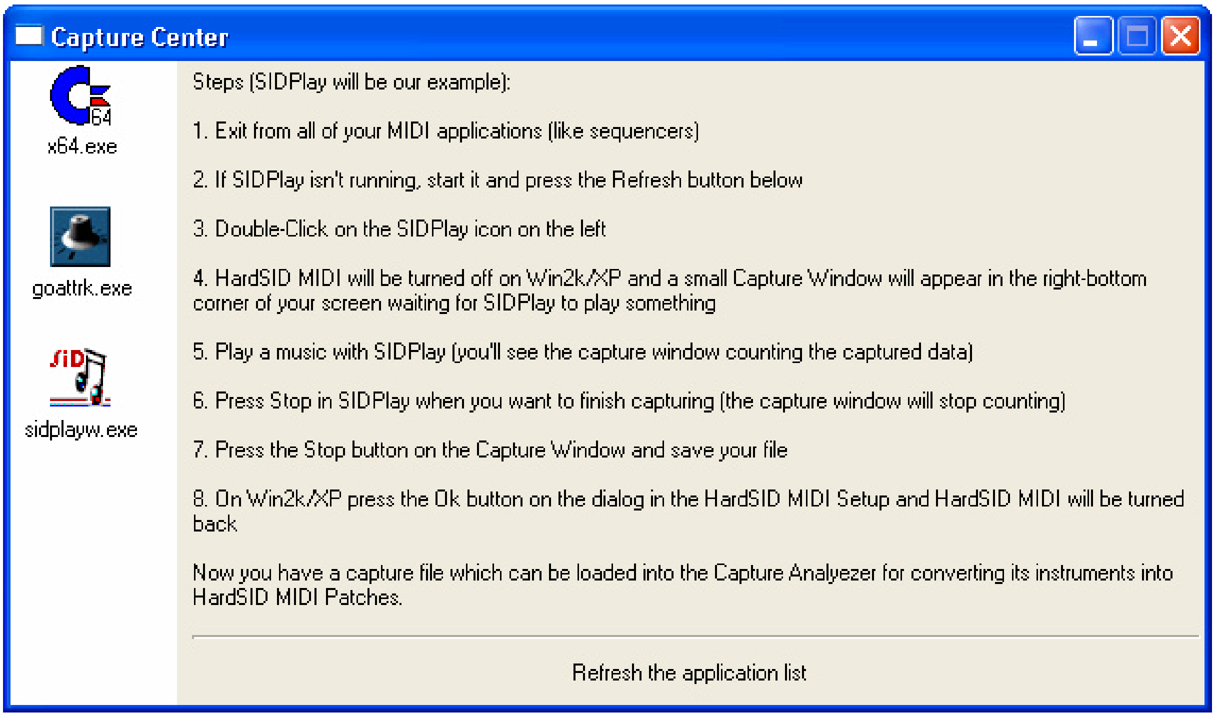
http://www.hardsid.com/modules.php?name=Content&pa=showpage&pid=13

The tools you'll need:

HardSID Capture Center

Menu: Tools\Capture Center

The first step to the Patch conversion is to select the sounds you wish to transfer into HardSID MIDI. Listen some tunes with SIDPlay, then if you've selected one, you have to capture it into a HardSID Capture file (.hsc file) with the HardSID Capture Center:



Steps (SIDPlay will be our example):

1. Exit from all of your MIDI applications (like sequencers)

2. If SIDPlay isn't running, start it and press the Refresh button below

3. Double-Click on the SIDPlay icon on the left

4. HardSID MIDI will be turned off on Win2k/XP and a small Capture Window will appear in the right-bottom corner of your screen waiting for SIDPlay to play something

5. Play a music with SIDPlay (you'll see the capture window counting the captured data)

6. Press Stop in SIDPlay when you want to finish capturing (the capture window will stop counting)

7. Press the Stop button on the Capture Window and save your file

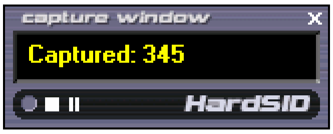
8. On Win2k/XP press the Ok button on the dialog in the HardSID MIDI Setup and HardSID MIDI will be turned back

Now you have a capture file which can be loaded into the Capture Analyezer for converting its instruments into HardSID MIDI Patches.

You can see on this example screenshot that three HardSID applications were running at the moment when the Capture Center was invoked. If there is no running HardSID application at the time you click the Capture Center menu, you ll be warned.

Please follow the instructions on the Capture Center window!

During the capturing process, this little Capture Window will appear in the right-bottom corner of your screen:



You can save the captured data as described on the Capture Center window. (if you didn t read the instructions, please read it)

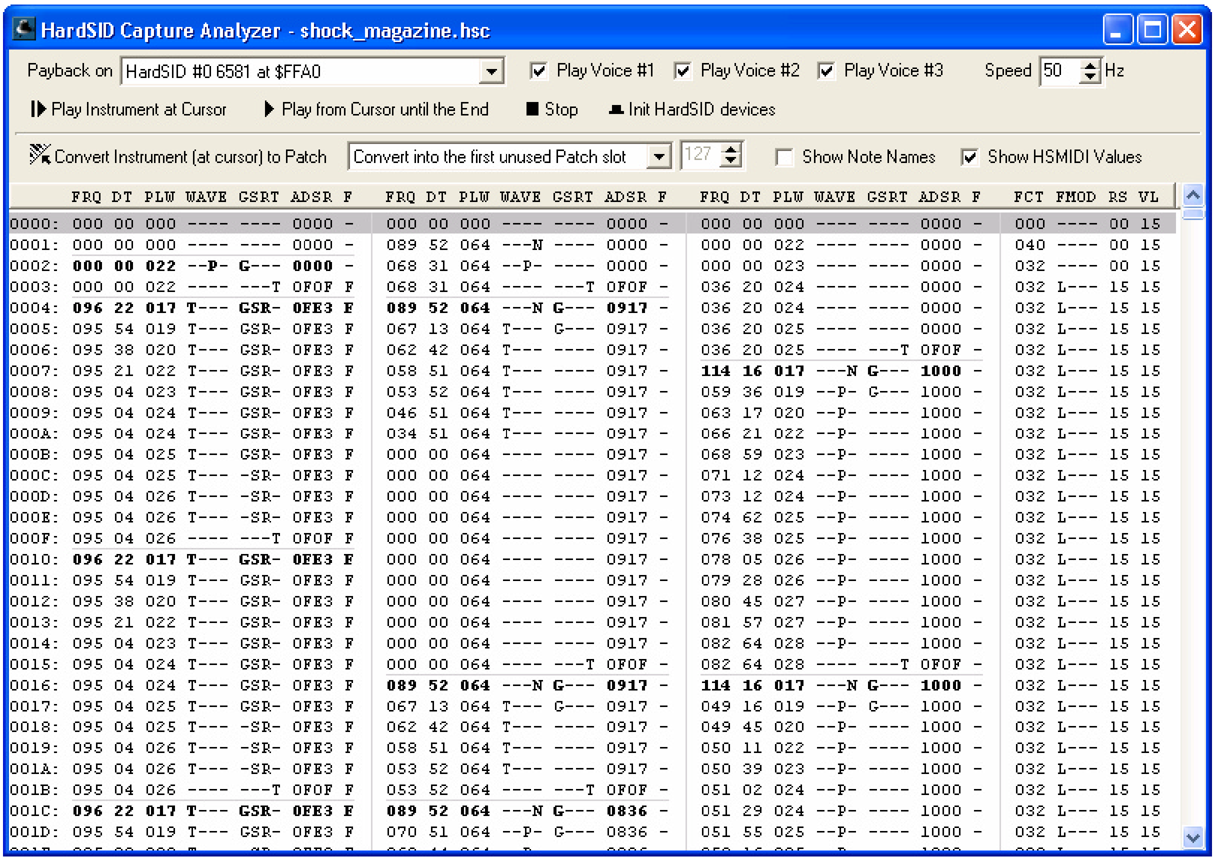
When you re done with capturing and you have the HardSID Capture File (.hsc) file, you can load it into the HardSID Capture Analyzer.

Important note: C64 tunes are not music files, but different and special C64 programs with very different timing methods. So, not all C64 tunes can be perfectly captured with the current capture method. There is no rule for that. You have to capture what you want and then try to play it back with the Capture Analyzer. If it plays the sounds well, you can go on with patch converting.

HardSID Capture Analyzer

Menu: Tools\Capture Analyzer

Once you have a HardSID Capture file (.hsc), you can start this menu and load the file into the HardSID Capture Analyzer. The analyzer window will then show you the contents of the capture file:



HardSID Capture Analyzer - shock_magazine.hsc
Payback on HardSID #0 6581 at $FFA0
☑ Play Voice #1 ☑ Play Voice #2 ☑ Play Voice #3 Speed 50 Hz
Play Instrument at Cursor
Play from Cursor until the End
Stop
Init HardSID devices
Convert Instrument (at cursor) to Patch
Convert into the first unused Patch slot
127
☐ Show Note Names ☑ Show HSMIDI Values

```
      FRQ DT PLW WAVE GSRT ADSR F   FRQ DT PLW WAVE GSRT ADSR F   FRQ DT PLW WAVE GSRT ADSR F   FCT FMOD RS VL
0000: 000 00 000 ---- ---- 0000 -   000 00 000 ---- ---- 0000 -   000 00 000 ---- ---- 0000 -   000 ---- 00 15
0001: 000 00 000 ---- ---- 0000 -   089 52 064 ---N ---- 0000 -   000 00 022 ---- ---- 0000 -   040 ---- 00 15
0002: 000 00 022 --P- G--- 0000 -   068 31 064 --P- ---- 0000 -   000 00 023 ---- ---- 0000 -   032 ---- 00 15
0003: 000 00 022 ---- ---T 0F0F F   068 31 064 ---- ---T 0F0F -   036 20 024 ---- ---- 0000 -   032 L--- 15 15
0004: 096 22 017 T--- GSR- 0FE3 F   089 52 064 ---N G--- 0917 -   036 20 024 ---- ---- 0000 -   032 L--- 15 15
0005: 095 54 019 T--- GSR- 0FE3 F   067 13 064 T--- G--- 0917 -   036 20 025 ---- ---- 0000 -   032 L--- 15 15
0006: 095 38 020 T--- GSR- 0FE3 F   062 42 064 T--- ---- 0917 -   036 20 025 ---- ---T 0F0F -   032 L--- 15 15
0007: 095 21 022 T--- GSR- 0FE3 F   058 51 064 T--- ---- 0917 -   114 16 017 ---N G--- 1000 -   032 L--- 15 15
0008: 095 04 023 T--- GSR- 0FE3 F   053 52 064 T--- ---- 0917 -   059 36 019 --P- G--- 1000 -   032 L--- 15 15
0009: 095 04 024 T--- GSR- 0FE3 F   046 51 064 T--- ---- 0917 -   063 17 020 --P- ---- 1000 -   032 L--- 15 15
000A: 095 04 024 T--- GSR- 0FE3 F   034 51 064 T--- ---- 0917 -   066 21 022 --P- ---- 1000 -   032 L--- 15 15
000B: 095 04 025 T--- GSR- 0FE3 F   000 00 064 ---- ---- 0917 -   068 59 023 --P- ---- 1000 -   032 L--- 15 15
000C: 095 04 025 T--- -SR- 0FE3 F   000 00 064 ---- ---- 0917 -   071 12 024 --P- ---- 1000 -   032 L--- 15 15
000D: 095 04 026 T--- -SR- 0FE3 F   000 00 064 ---- ---- 0917 -   073 12 024 --P- ---- 1000 -   032 L--- 15 15
000E: 095 04 026 T--- -SR- 0FE3 F   000 00 064 ---- ---- 0917 -   074 62 025 --P- ---- 1000 -   032 L--- 15 15
000F: 095 04 026 ---- ---T 0F0F F   000 00 064 ---- ---- 0917 -   076 38 025 --P- ---- 1000 -   032 L--- 15 15
0010: 096 22 017 T--- GSR- 0FE3 F   000 00 064 ---- ---- 0917 -   078 05 026 --P- ---- 1000 -   032 L--- 15 15
0011: 095 54 019 T--- GSR- 0FE3 F   000 00 064 ---- ---- 0917 -   079 28 026 --P- ---- 1000 -   032 L--- 15 15
0012: 095 38 020 T--- GSR- 0FE3 F   000 00 064 ---- ---- 0917 -   080 45 027 --P- ---- 1000 -   032 L--- 15 15
0013: 095 21 022 T--- GSR- 0FE3 F   000 00 064 ---- ---- 0917 -   081 57 027 --P- ---- 1000 -   032 L--- 15 15
0014: 095 04 023 T--- GSR- 0FE3 F   000 00 064 ---- ---- 0917 -   082 64 028 --P- ---- 1000 -   032 L--- 15 15
0015: 095 04 024 T--- GSR- 0FE3 F   000 00 064 ---- ---T 0F0F -   082 64 028 ---- ---T 0F0F -   032 L--- 15 15
0016: 095 04 024 T--- GSR- 0FE3 F   089 52 064 ---N G--- 0917 -   114 16 017 ---N G--- 1000 -   032 L--- 15 15
0017: 095 04 025 T--- GSR- 0FE3 F   067 13 064 T--- G--- 0917 -   049 16 019 --P- G--- 1000 -   032 L--- 15 15
0018: 095 04 025 T--- -SR- 0FE3 F   062 42 064 T--- ---- 0917 -   049 45 020 --P- ---- 1000 -   032 L--- 15 15
0019: 095 04 026 T--- -SR- 0FE3 F   058 51 064 T--- ---- 0917 -   050 11 022 --P- ---- 1000 -   032 L--- 15 15
001A: 095 04 026 T--- -SR- 0FE3 F   053 52 064 T--- ---- 0917 -   050 39 023 --P- ---- 1000 -   032 L--- 15 15
001B: 095 04 026 ---- ---T 0F0F F   053 52 064 ---- ---T 0F0F -   051 02 024 --P- ---- 1000 -   032 L--- 15 15
001C: 096 22 017 T--- GSR- 0FE3 F   089 52 064 ---N G--- 0836 -   051 29 024 --P- ---- 1000 -   032 L--- 15 15
001D: 095 54 019 T--- GSR- 0FE3 F   070 51 064 --P- G--- 0836 -   051 55 025 --P- ---- 1000 -   032 L--- 15 15
```

Now, you ll have to find where your beloved sound starts.

There are two main ways for that:

1. The basic way: Finding the sound by playback and disabling voices
2. The advanced way: Finding the sound by sound properties

The basic way:

1. Select the playback device you wish to use
2. Set the speed of the tune if it is not 50Hz (special tunes can play at 100Hz, 400Hz, etc...)
3. Press SPACE (or the ‘Play Instrument at Cursor ” button)
4. Do it until you first hear the sound you re searching for

5. Find out which SID sounds are involved in your sound by disabling and re-enabling the Play Voice #1-3 checkboxes. Always click back to the position where your sound starts and play it again without voice #1-3. You'll hear if you've unchecked the one(s) needed for your sound. If your sound plays bad, check the voice back. (you may want to press stop between the steps to mute voices you've just checked out)
6. Now, you know where your sound starts and you know which sounds are playing it (mostly only one sound will be involved).

Now read the "Patch Conversion" part after the "advanced way" text!

The advanced way:

The Capture Analyzer shows you all of the information you'll need:

- All the three SID voices are separated by a vertical gray line
- The global SID settings are displayed at the end of each line
- Every Instrument start is displayed in bold
- Every Instrument is separated from the next one with a horizontal gray line

Voice properties:

- **FRQ**: Freq/Pitch. Shows the MIDI note value (023 for example) or MIDI Note Name (C#4 for example) of the current row. Check the "Show Note Names" checkbox if you want to see note names (C#4).
- **DT**: HardSID MIDI compatible detune value for the row
- **PLW**: HardSID MIDI compatible Pulse Width value for the row.
- **WAVE**: Waveform settings for the row. It can be a set of T=triangle; S=saw tooth; P=Pulse; N=Noise.
- **GSRT**: Gate/Sync/Ring modulation/Test bit setting for the row.
- **ADSR**: ADSR setting for the row in hexadecimal form (due to the lack of space, it is not written in milliseconds and seconds).
- **F**: "F" = filtered; "- " = not filtered

Global SID properties for each row:

- **FCT**: HardSID MIDI compatible Filter Cutoff value for the row.
- **FMOD**: Filter Mode for the row. Can be a set of L=low pass; B=band pass; H=high pass; X=external.
- **RS**: Filter Resonance for the row
- **VL**: SID Volume Setting for the row

Important note: Some columns are shown as a 0..127 value in the Analyzer window, because MIDI values are always scaled from 0…127. However, the Table Editor in HardSID MIDI has the resolution of 0..254 for these columns, so **if you want to enter a value into the Table Editor by hand, you have to multiply the displayed value by two**.

These columns are:

- **PLW (pulse width)**
- **FCT (filter cutoff)**

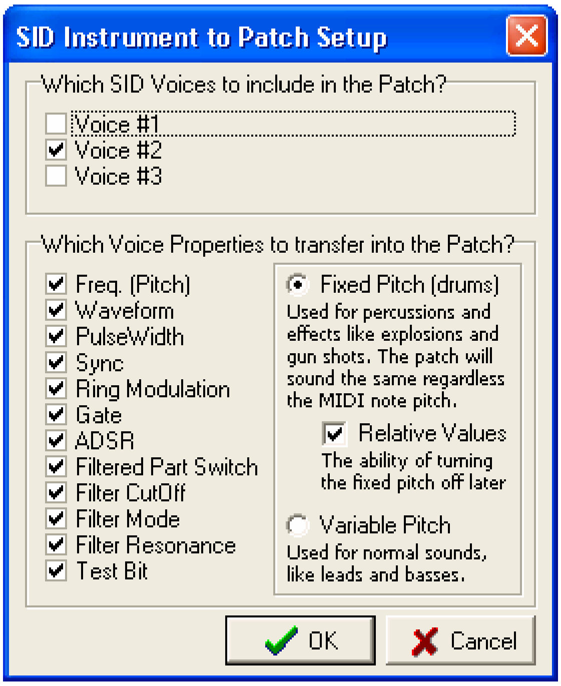
If you ’re experienced enough, you ’ll be able to tell where your sound starts and which voices are involved just by looking at the displayed data. However, most of the people will go the “basic way” of course.

Patch conversion:

If you ’re under WinXP/2k and you have a MIDI keyboard, you should enable the “MIDI Control” checkbox at the top of the screen now. (to let you play with your ready patch after conversion)

Click on the start of your sound and press the “Convert Instrument (at cursor) to Patch” button.

A little window will appear with many settings:



SID Instrument to Patch Setup

Which SID Voices to include in the Patch?

☐ Voice #1
☑ Voice #2
☐ Voice #3

Which Voice Properties to transfer into the Patch?

☑ Freq. (Pitch)
☑ Waveform
☑ PulseWidth
☑ Sync
☑ Ring Modulation
☑ Gate
☑ ADSR
☑ Filtered Part Switch
☑ Filter CutOff
☑ Filter Mode
☑ Filter Resonance
☑ Test Bit

● Fixed Pitch (drums)
Used for percussions and effects like explosions and gun shots. The patch will sound the same regardless the MIDI note pitch.

☑ Relative Values
The ability of turning the fixed pitch off later

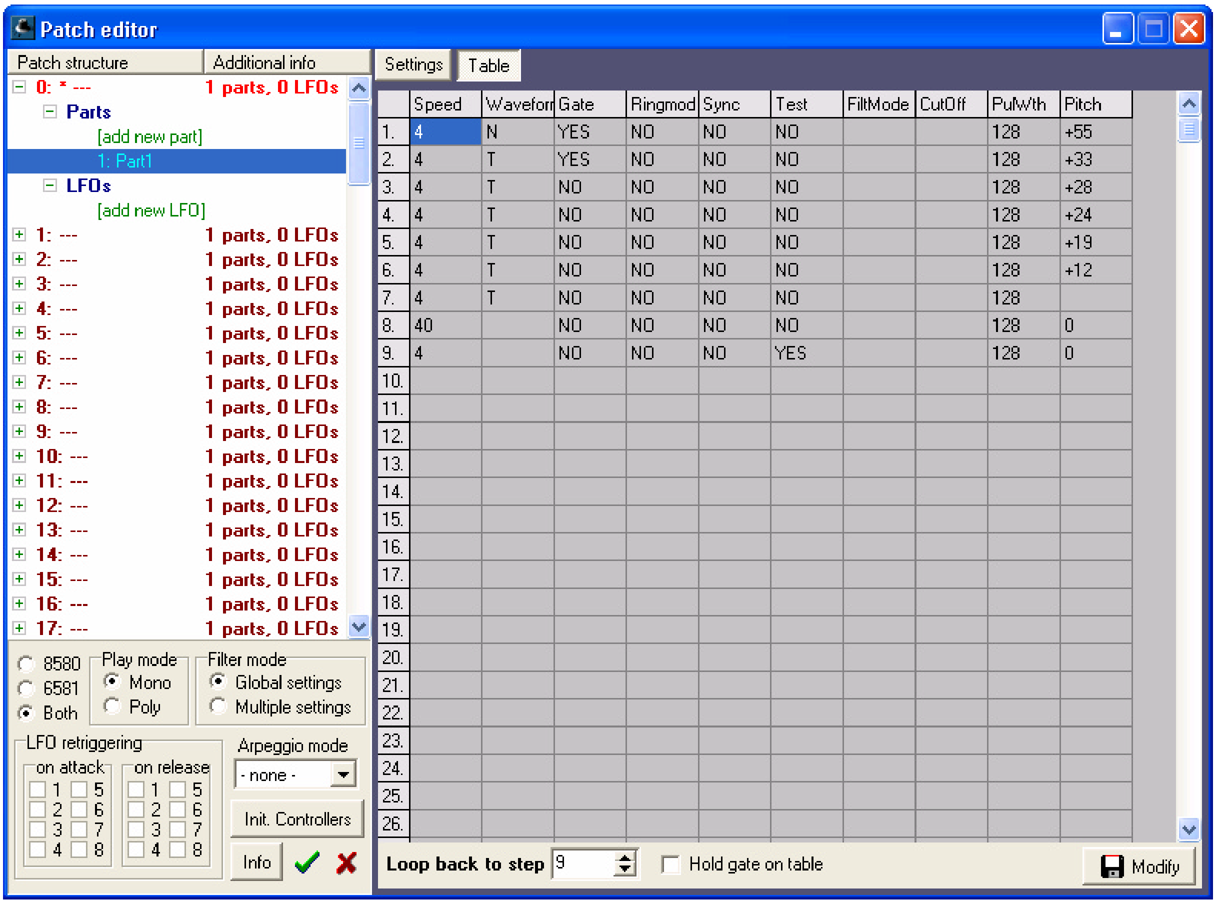
○ Variable Pitch
Used for normal sounds, like leads and basses.

(This example screenshot is set up well for a drum sound, which is originally played by SID voice #2.)

1. Select the voice(s) which are originally playing the instrument you’re just converting to Patch (mostly just one voice)
2. Select the proper pitch mode for the new patch. If you’re converting a drum or other effect that is always played the same way regardless the MIDI note, check Fixed Pitch. If you’re converting a regular instrument, like a bass or lead voice that will play melodies, use Variable Pitch.
3. Optional: If you’re very experienced and you surely know that you don’t want the converter to deal with some of the sound’s properties, you can uncheck any. Beginners leave everything checked.

Now press the “OK” button and your patch will be ready. It will contain as many Parts as many voices you included.

A generated part’s table will look something like this:



0: * --- 1 parts, 0 LFOs
Parts
[add new part]
1: Part1
LFOs
[add new LFO]
1: --- 1 parts, 0 LFOs
2: --- 1 parts, 0 LFOs
3: --- 1 parts, 0 LFOs
4: --- 1 parts, 0 LFOs
5: --- 1 parts, 0 LFOs
6: --- 1 parts, 0 LFOs
7: --- 1 parts, 0 LFOs
8: --- 1 parts, 0 LFOs
9: --- 1 parts, 0 LFOs
10: --- 1 parts, 0 LFOs
11: --- 1 parts, 0 LFOs
12: --- 1 parts, 0 LFOs
13: --- 1 parts, 0 LFOs
14: --- 1 parts, 0 LFOs
15: --- 1 parts, 0 LFOs
16: --- 1 parts, 0 LFOs
17: --- 1 parts, 0 LFOs

○ 8580 ○ 6581 ● Both

Play mode: ● Mono ○ Poly

Filter mode: ● Global settings ○ Multiple settings

LFO retriggering — on attack: □ 1 □ 5 □ 2 □ 6 □ 3 □ 7 □ 4 □ 8; on release: □ 1 □ 5 □ 2 □ 6 □ 3 □ 7 □ 4 □ 8

Arpeggio mode: - none -

Init. Controllers

Info ✓ ✗

	Speed	Wavefor	Gate	Ringmod	Sync	Test	FiltMode	CutOff	PulWth	Pitch
1.	4	N	YES	NO	NO	NO			128	+55
2.	4	T	YES	NO	NO	NO			128	+33
3.	4	T	NO	NO	NO	NO			128	+28
4.	4	T	NO	NO	NO	NO			128	+24
5.	4	T	NO	NO	NO	NO			128	+19
6.	4	T	NO	NO	NO	NO			128	+12
7.	4	T	NO	NO	NO	NO			128	
8.	40		NO	NO	NO	NO			128	0
9.	4		NO	NO	NO	YES			128	0
10.										
11.										
12.										
13.										
14.										
15.										
16.										
17.										
18.										
19.										
20.										
21.										
22.										
23.										
24.										
25.										
26.										

Loop back to step 9 □ Hold gate on table Modify

Try out your new patch with your MIDI keyboard!

If MIDI Control is not checked or you’re not on Windows XP/2k, you’ll have to check it or start a sequencer, select this patch and try it this way. The most comfortable is always to use WinXP/2k and a MIDI keyboard.

If you have to adjust anything on your patch, you can do it easily.

For example you may want to check "Hold gate on table" for melodic sounds (don't forget to press "Modify" after changing the settings) or you can play around with the table values for getting some more experience.

If your patch isn't a very special effect, like a drum or gunshot for example, some columns of the table may contain pretty same and rarely changing values. This columns can be cleared out (press "Modify" after it) and you can move to the Part editor and set up these properties with constant settings or LFOs. (for example the pitch, pulse width or filter cutoff may be improved with some portamento or cool LFOs added to the original sound) It is up to you if you use it "as is" or you play around and improve it.

HardSID MIDI Exchange Community

We'd like to invite you to the HardSID MIDI Exchange Community at http://www.hardsid.com . You can upload your own creations (full projects, single patches, MIDI songs, MP3s) and download other people's work!

The HardSID MIDI Exchange is dedicated to help you and others to share experiences by uploading and downloading HardSID MIDI related files such as:

? **Complete HardSID MIDI Projects** (*.hpr files)
We strongly recommend for everyone to upload projects instead of single Patch files. HardSID MIDI Projects (*.hrp) can be Exported and Imported in the Projects menu of the HardSID MIDI Setup program. HardSID MIDI Projects are consisting of a Patch Bank, a full Channel Setup and the System Clock setting required for the Patch Bank.

? **MIDI Music Files** for your uploaded HardSID MIDI Projects
Can be *.mid, *.wrk or whatever your sequencer saves files as

? **HardSID MIDI Patches** (*.hsp files)
If you make only a few patches without any special Channel Setup requirement, you can upload them here file by file.

? **HardSID MIDI MP3 files**