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Best SID emulation



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Author	Message
MartinPiper Groupie  Joined: 11 Jun 2007 Posts: 160	<div>  Posted: Wed Jun 17, 2009 4:59 am Post subject: Best SID emulation  quote </div> <p>OK, this is a topic that might ruffle a few feathers but what in your opinion in the most accurate (i.e. best sound compared to the real chip) SID emulator, both open source and/or closed source? Processor time or operating system is not important. 😊 Give reasons, for example XXX emulator plays these difficult SID files more correctly than YYY emulator.</p> <div> profile pm </div>
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Fröhn Grandmaster of C64 	<div>  Posted: Wed Jun 17, 2009 11:51 am Post subject:  quote </div> <p>The best SID emulation is the one from alankila. You can activate it in Vice by selecting</p>



Joined: 13 Jan 2003
Posts: 1938

the "reSID-FP" emulation.

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nata

Über Groupie



Joined: 01 Jun 2005
Posts: 377

Posted: Wed Jun 17, 2009 1:38 pm Post subject:

[quote](#)

Quote:

closed source

Hoxs 64 <http://www.hoxs64.net/>

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Magnate

Groupie



Joined: 11 Feb 2002
Posts: 266

Posted: Wed Jun 17, 2009 3:27 pm Post subject:

[quote](#)

Depends on the revision:

6581: resid-fp

8580: Hoxs64

C64C + 1541-II, or **Hoxs64** as an accurate equivalent.

Visit hvsc.c64.org for the most comprehensive SID collection.

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hurminator

Posted: Fri Jul 10, 2009 3:08 pm Post subject:

[quote](#)

hannimato

Grandmaster of C64



Joined: 03 Feb 2004

Age: 41

Posts: 2403

Location: Columbus, Ohio

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Posted: Fri Jul 10, 2009 3:08 pm Post subject:

[quote](#)

Magnate wrote:

Depends on the revision:

6581: resid-fp

8580: Hoxs64

Any word on when Hoxs will be updated? It has been over 1 year. It would be great to have 6581 and NTSC emulation.

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groepaz

Immortal Grandmaster of C64



Joined: 13 Oct 2004

Posts: 4359

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Posted: Fri Jul 10, 2009 4:53 pm Post subject:

[quote](#)

Quote:

6581: resid-fp

8580: Hoxs64

somehow i'd like to see some example tunes that show how hoxs64 is actually better ... i somehow doubt it 😊

<http://www.hitmen-console.org> <http://rr.pokefinder.org>
<http://magicdisk.untergrund.net> <http://ftp.pokefinder.org>

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nata

Über Groupie



Posted: Sat Jul 11, 2009 2:08 pm Post subject:

[quote](#)

Honestly, the latest reSID-fp (v36) 8580 combined waves (Especially \$71) sounds somewhat strange at the moment, IMHO.

Joined: 01 Jun 2005
Posts: 377

The rest is quite OK. 😊

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groepaz

Immortal Grandmaster of
C64



Joined: 13 Oct 2004
Posts: 4359

📅 Posted: Sat Jul 11, 2009 7:56 pm Post subject:



Quote:

Honestly, the latest reSID-fp (v36) 8580 combined waves (Especially \$71) sounds somewhat strange at the moment, IMHO.

"sounds strange" isn't a way to actually judge the quality though, not at all.

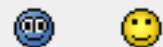
<http://www.hitmen-console.org> <http://rr.pokefinder.org>
<http://magicdisk.undergrund.net> <http://ftp.pokefinder.org>

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Magnate

Groupie



Joined: 11 Feb 2002
Posts: 266

📅 Posted: Sun Jul 12, 2009 10:10 am Post subject:



hurminator wrote:

Any word on when Hoxs will be updated? It has been over 1 year. It would be great to have 6581 and NTSC emulation.

There has been a major breakthrough with 1541 emulation improvements (valid, unpatched images of games protected with Rapidlok finally work correctly), so a new version is expected soon.

groepaz wrote:

"sounds strange" isn't a way to actually judge the quality though, not at all.

Indeed, it is less likely to become a matter of individual preference if the accuracy is measured with test programs capable of giving 0/1 results. One such openly available program is the 8580 oscillator test checking for 1 cycle delay of the real chip.

C64C + 1541-II, or **Hoxs64** as an accurate equivalent.
Visit hvsc.c64.org for the most comprehensive SID collection.

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alankila

Groupie in Training



Joined: 29 Dec 2005
Age: 35
Posts: 112
Location: Helsinki

📅 Posted: Sun Jul 12, 2009 12:55 pm Post subject:



groepaz wrote:

"sounds strange" isn't a way to actually judge the quality though, not at all.

I accept the chance that there is something wrong with the waveforms. They are no longer based on direct measurements but by a crude form of analog simulation. As such, they are a work in progress.

Magnate wrote:

Indeed, it is less likely to become a matter of individual preference if the accuracy is measured with test programs capable of giving 0/1 results. One such openly available program is the 8580 oscillator test checking for 1 cycle delay of the real chip.

This issue remains open. Since the digital side of both 6581 and 8580 seems identical, I'm tempted to argue that the 1-clock delay arises elsewhere in the system and therefore isn't in scope of reSID and its derivatives.

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hurminator

Grandmaster of C64



Joined: 03 Feb 2004

Age: 41

Posts: 2403

Location: Columbus, Ohio

Posted: Sun Jul 12, 2009 12:55 pm Post subject:



Magnate wrote:

hurminator wrote:

Any word on when Hoxs will be updated? It has been over 1 year. It would be great to have 6581 and NTSC emulation.

There has been a major breakthrough with 1541 emulation improvements (valid, unpatched images of games protected with Rapidlok finally work correctly), so a new version is expected soon.

Thanks, I look forward to its release 😊

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nata

Über Groupie



Joined: 01 Jun 2005

Posts: 377

Posted: Sun Jul 12, 2009 1:03 pm Post subject:



groepaz wrote:

Quote:

Honestly, the latest reSID-fp (v36) 8580 combined waves (Especially \$71) sounds somewhat strange at the moment, IMHO.

"sounds strange" isn't a way to actually judge the quality though, not at all.

ftp://ftp.untergrund.net/users...waves_b.7z

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alankila

Groupie in Training



Joined: 29 Dec 2005

Age: 35

Posts: 112

Location: Helsinki

📄 Posted: Sun Jul 12, 2009 1:25 pm Post subject:



nata wrote:

groepaz wrote:

Quote:

Honestly, the latest reSID-fp (v36) 8580 combined waves
(Especially \$71) sounds somewhat strange at the moment, IMHO.

"sounds strange" isn't a way to actually judge the quality though,
not at all.

ftp://ftp.untergrund.net/users...waves_b.7z

Thank you for the proof positive that I need an adjustment on a certain parameter.

Give this new build of jsidplay2 a test run. I hope it sounds better:

<http://bel.fi/~alankila/jsidplay2.jar>

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nata

Über Groupie



📄 Posted: Wed Jul 15, 2009 9:08 am Post subject:



Not really, maybe a tiny a bit. Surprisingly the combined waves from the old &
unpatched reSID perfectly match (more or less) with my both 8580's.

Joined: 01 Jun 2005
Posts: 377

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alankila

Groupie in Training



Joined: 29 Dec 2005
Age: 35
Posts: 112
Location: Helsinki

Posted: Mon Jul 20, 2009 12:58 pm Post subject:



nata wrote:

Not really, maybe a tiny a bit. Surprisingly the combined waves from the old & unpatched reSID perfectly match (more or less) with my both 8580's.

Right. I guess it's a bit embarrassing that I insist on trying to derive the waveforms rather than just using readily available sampled data, especially when my approach produces noticeably worse results. I'll promise I'll try to improve these again, but perhaps I have to consider just reverting to the reSID data files for 8580 emulation.

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groepaz

Immortal Grandmaster of C64



Joined: 13 Oct 2004
Posts: 4359

Posted: Fri Jul 24, 2009 1:44 pm Post subject:



na, please don't. at the end deriving them will pay off, even if its a step backwards right now.

<http://www.hitmen-console.org> <http://rr.pokefinder.org>
<http://magicdisk.undergrund.net> <http://ftp.pokefinder.org>

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Kong Daddy

Posted: Sat Jul 25, 2009 3:43 am Post subject:





Joined: 27 Mar 2003
Posts: 1102

I certainly use the reSID part of VICE whenever I'm not recording my VICE session as a video file. Seeing as I always use the 6581 as my SID on VICE it's certainly good enough for me.

From memory I think the BMX Kidz high score tune was one of the tunes that had less of a difference to my actual silver label machine. Can't think of the others now though.

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Fröhn

Grandmaster of C64



Joined: 13 Jan 2003
Posts: 1938

Posted: Sat Jul 25, 2009 9:46 am Post subject:



I'm not so sure if the sampled mixed waveforms in Vice are correct. When I sampled them on my 8580 with the CPU (using several passes with 1 clock cycle shift each time) I got much different mixed waveforms. Maybe the result depends on the way you do the \$D41B polling too.

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nata

Über Groupie



Joined: 01 Jun 2005
Posts: 377

Posted: Sat Jul 25, 2009 12:14 pm Post subject:



Btw. Hoxs64 has slightly too much filter resonance.

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groepaz

Immortal Grandmaster of C64



Joined: 13 Oct 2004
Posts: 4359

Posted: Sun Jul 26, 2009 8:57 am Post subject:

**Quote:**

Btw. Hoxs64 has slightly too much filter resonance.

doesnt that depend on the external capacitors and thus varies wildly between real c64s? (caps have +/-10% tolerance, or worse !)

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<http://magicdisk.untergrund.net> <http://ftp.pokefinder.org>

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**nata**

Über Groupie



Joined: 01 Jun 2005
Posts: 377

Posted: Sun Jul 26, 2009 12:01 pm Post subject:



Well, David boosted the the resonance after showing him some filter/reso recordings about 3 years ago. (before it was extremely weak)

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**Fröhn**

Grandmaster of C64



Joined: 13 Jan 2003

Posted: Sun Jul 26, 2009 6:13 pm Post subject:



So you basically made him emulate YOUR sid and not "the sid"?

Joined: 15 Jan 2005
Posts: 1938

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nata

Über Groupie



Joined: 01 Jun 2005
Posts: 377

Posted: Sun Aug 16, 2009 2:19 pm Post subject:



Quote:

Right. I guess it's a bit embarrassing that I insist on trying to derive the waveforms rather than just using readily available sampled data, especially when my approach produces noticeably worse results. I'll promise I'll try to improve these again, but perhaps I have to consider just reverting to the reSID data files for 8580 emulation.

Actually, It would be cool if one could choose between sets of combined waveforms in reSID-fp. (similar to the filter curves)

Fröhn wrote:

So you basically made him emulate YOUR sid and not "the sid"?

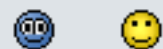
Nope. My SIDs cutoff a bit more 'open' (usually one can't hear it directly), but it is similar to 'FilterTrurl8580R5_3691' in reSID. Also Dave has slightly different combined waves.

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Magnate

Groupie



Posted: Sun Aug 16, 2009 5:30 pm Post subject:



groepaz wrote:

Quote:

Btw. Hoxs64 has slightly too much filter resonance.

Joined: 11 Feb 2002
Posts: 266

doesnt that depend on the external capacitors and thus varies wildly between real c64s? (caps have +/-10% tolerance, or worse !)

It indeed varies between C64s. Not much, though, I'd say the difference is minor. One of the 8580s I have actually shows a bit more filter resonance than both Hoxs64 and resid-fp.

C64C + 1541-II, or **Hoxs64** as an accurate equivalent.
Visit hvsc.c64.org for the most comprehensive SID collection.

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alankila

Groupie in Training



Joined: 29 Dec 2005
Age: 35
Posts: 112
Location: Helsinki

📄 Posted: Wed Sep 02, 2009 4:52 pm Post subject:



groepaz wrote:

Quote:

Btw. Hoxs64 has slightly too much filter resonance.

doesnt that depend on the external capacitors and thus varies wildly between real c64s? (caps have +/-10% tolerance, or worse !)

No, the capacitors do not actually enter into it.

Resonance should be understood as a multiplier on bandpass feedback circuitry. The capacitors control the center frequency, and the resistor network driven by the RES bits controls the resonance value. If the Q value increases, the feedback from bandpass decreases, which tends to cause the bandpass to oscillate more strongly for equivalent effect. (The lp and hp are both modified by the resonance as well, but since they are in

opposing phase, they will always cancel out at the center frequency.)

If there are noticeable differences on the 8580 design, it is likely for similar reasons that the fc curves differ: again the process that was used to build the chip is not perfectly uniform. Resistor values inside the chip differ -- principally the same cause that gives rise to the varying 6581 curves. That being said, I would expect that the values are within 10 % tolerance from some ideal average chip.

Based on my experience, the resonance Q value goes from 0.71 to 1.71, which as a control goes from about 0 dB resonance to about 10 dB. (Or was it 8 dB? I can't recall.) These are the values that reSID and -fp uses, and they are so close to the right values that any bit of change tends to sound worse or makes artifacts. The 10 % adjustment ought to go to the difference between the two, yielding 1.61 - 1.82 as the approximate range for finetuning. jsidplay2 has this kind of resonance adjustment knob, so one can play with it (gently!) and experiment if it helps.

Incidentally, I have earlier changed 6581 resonance. I tried to use it to make distortion more prominent in some instances, so I adjusted the multiplier knob to set the maximum Q to about 2.3. (Yes, whole 60 % up!) Not long ago, I concluded that this is all ultimately nonsense and the Q maximum for 6581 must be around 1.7, too, which is where reSID originally put it. This has been fixed in jsidplay2 CVS as well.

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