I/V on the PCM1704

Moderators: roiibm, Mikeg

Author	Message
ezkcdude	**Post subject:** **Posted:** Thu Oct 05, 2006 12:29 pm

offline

Cow

Joined: Mon May 01, 2006 11:44 pm
Posts: 186
Location: Kansas City, MO

> **SSassen wrote:**
>
> Well, since you have to order a XO anyway, why not avoid the problem completely and just pick a frequency that's not available in 'the wild' ie. not used by any CD-player? Jitter will be substantial if it indeed is 1:1. In practice most CD-players use 11.23 or 16.43MHz, so opting for 18 or 25MHz is a save bet. I used 18MHz before, which with a 128Fs setting on the SRC gives you a 144KHz sample rate, opting for 25MHz then equates to 192KHz which is what I'm currently using.
>
> Best regards,
>
> Sander Sassen
> Optimized for efficiency

The XO I'm using is 24.576 MHz, and I'm setting the ASRC to 256*Fs, so it will upsample to 96kHz.

_____
He's not hi-fi, he's my stereo.
DIY projects:
http://www.ezdiyaudio.com

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chris719

offline

Cow

Joined: Mon Sep 26, 2005 4:09 am
Posts: 342

Post subject:

Posted: Thu Oct 05, 2006 12:41 pm

Is there any data anywhere that indicates running at an integer multiple of Fs-in causes higher jitter? I could see that having two nearly the same frequencies cause the rate estimation to have to update more frequently if it drifts, but...

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SSassen

offline

Cow

Joined: Mon Apr 10, 2006 3:08 pm
Posts: 428
Location: Edam

Post subject:

Posted: Thu Oct 05, 2006 12:48 pm

> **Quote:**
> Is there any data anywhere that indicates running at an integer multiple of Fs-in causes higher jitter?

I haven't searched for any, but the reason I am not running a multiple of Fs is because a good friend of mine that develops and builds AD and DA convertors for studio use told me that it has indeed shown to be beneficial in all of his measurements and calculations. He's the lead-designer for AD and DA products at Grimm Audio (http://www.grimmaudio.com/) and as such has had many, many years of experience.

Best regards,

Sander Sassen
Simulate, build, stimulate

_____
Indoctrinated in the ways of the dark side

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carlosfm

offline

Dog

Joined: Tue Dec 14, 2004 12:26 pm
Posts: 4981
Location: Lisbon, Portugal

Post subject:

Posted: Thu Oct 05, 2006 1:02 pm

It beats my logic why would it be better to upsample **44.1khz** to 96khz or 192khz instead of 88.2khz or 176.4khz (integer multiples).
But then again, my logic must be getting old...

_____
Carlos Filipe

"Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius - and a lot of courage - to move in the opposite direction." **Albert Einstein**

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Elso Kwak

offline

Board jester

Joined: Mon Dec 13, 2004 3:08 pm
Posts: 2042

Post subject:

Posted: Thu Oct 05, 2006 1:11 pm

> **carlosfm wrote:**
>
> It beats my logic why would it be better to upsample **44.1khz** to 96khz or 192khz instead of 88.2khz or 176.4khz (integer multiples).
> But then again, my logic must be getting old...

It's explained in some sample rate converter datasheet of Analog Devices.

_____
Elso

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JoshK

offline

Sheep

Post subject:

Posted: Thu Oct 05, 2006 2:01 pm

Sander,

Do you have any sort of flow chart or rough schematic for your scheme? I want to see if I am following your description correctly or not.

Joined: Thu Apr 06, 2006 4:29 pm
Posts: 38

[this is not to copy but for me to learn]

Josh

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SSassen

offline

Cow

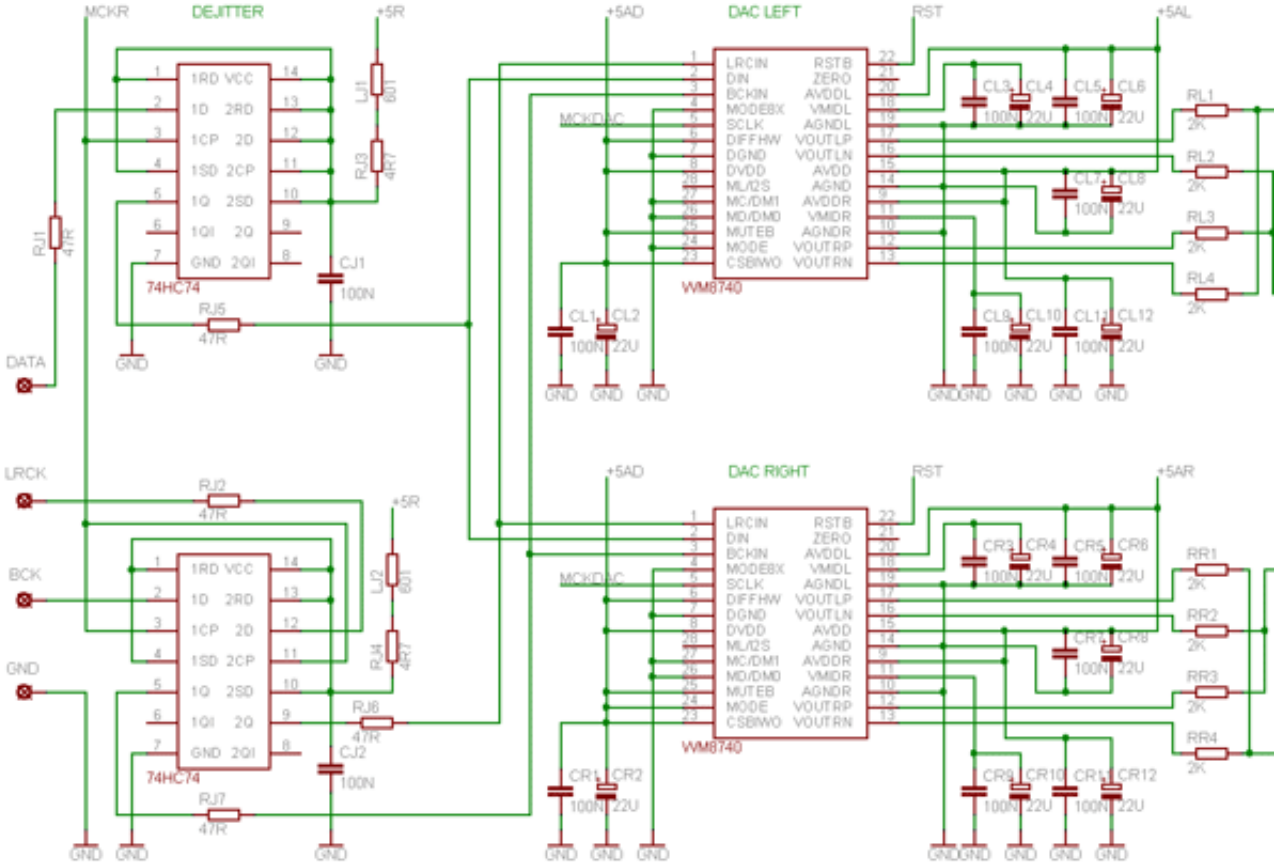
Joined: Mon Apr 10, 2006 3:08 pm
Posts: 428
Location: Edam

Post subject:

Posted: Thu Oct 05, 2006 2:19 pm

Josh,

I don't, but I can cut and paste bits from a previous DAC project using the same reclocking scheme. The most important part is to use a stable clock for all parts, but for the SPDIF receiver. The dejitter is an integral part of the whole reclocking scheme, it uses the 74HC74 (D-type flip-flop with set and reset, positive-edge trigger) which is fed the inverse of the clock to reclock the incoming data. The below schematic illustrates this, this is a differential Wolfson WM8740 DAC I designed (only showing dejitter and DAC) that uses this concept and has I2S input.



Best regards,

Sander Sassen
Re, re, reclocking

_____
Indoctrinated in the ways of the dark side

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Gordon

offline

Post subject:

Posted: Thu Oct 05, 2006 2:19 pm

Gang,

Goat

Joined: Tue Jan 31, 2006 4:16 pm
Posts: 572
Location: Zinzinnati, Ohio

The 1704 and a transformer is not a great idea. It just does not have the drive current for that.

Best bet is a grounded grid/base/gate approach which results in a simple one device conversion.

I folled around with LM394's and Toshiba FETS and also some tubes and found some pretty easy ways of doing this.

Since you want to keep the Vout = 0 the NPN design is the easiest as you can simple put a current source between the emitter and the negative supply (-5V) then a resistor between the collector and B+ and then bias the base using a diode or in the case of the LM394 I just use the other matched half.

I have seen some designs that use NPN and then feedback via the base and 2 resistors. Not really sure why... but you maybe want something different than I do.

Passive resistors don't work on the 1704 and something I would not suggest. Opamps suck the life out of music.

This is not something you can just throw together and get to work. This requires time and effort on your part. Sure you can throw it together and get music out the back end but in my experience it won't be worth it until you have really poored sometime into it.

Thanks
Gordon

_____
Gordon
Chief Scientist
Wavelength Audio

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carlosfm

Post subject:

Posted: Thu Oct 05, 2006 2:49 pm

offline

Dog

Sander, for best results you should use **one** 74HC74 for each signal you want to reclock.
The way you are using it (the usual way, in fact) you are not minimizing jitter as much as you could.
There's crosstalk, those 74's lack one PSU pin for each input, for proper decloupling.

_____
Carlos Filipe

Joined: Tue Dec 14, 2004 12:26 pm
Posts: 4981
Location: Lisbon, Portugal

"Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius - and a lot of courage - to move in the opposite direction." **Albert Einstein**

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carlosfm **Post subject:** **Posted:** Thu Oct 05, 2006 2:55 pm

offline

Dog

Joined: Tue Dec 14, 2004 12:26 pm
Posts: 4981
Location: Lisbon, Portugal

> **Elso Kwak wrote:**
>
> It's explained in some sample rate converter datasheet of Analog Devices.

96khz and 192khz are integer multiples of **48khz**.
That's how it should be used, to upsample from 48khz sources.

I'll look at those datasheets, have them on my hdd...

_____
Carlos Filipe

"Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius - and a lot of courage - to move in the opposite direction." **Albert Einstein**

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chris719 **Post subject:** **Posted:** Thu Oct 05, 2006 4:43 pm

offline

Cow

Joined: Mon Sep 26, 2005 4:09 am
Posts: 342

Does synchronous reclocking really bring benefits that make it worth the extra effort? I understand that SRCs and digital filters can be significant sources of jitter, but it will take most likely 4 picogates + decoupling for each to do it.

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Jocko Homo **Post subject:** **Posted:** Thu Oct 05, 2006 5:01 pm

offline

Benjamin

Joined: Mon Dec 13, 2004 3:29 pm
Posts: 4270
Location: Somewhere other than here.

How long have I been saying what Gordon is saying? No one pays attention, so I get tired of saying it.

I'll defer to him to keep you guys straight.

Jocko

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JoshK **Post subject:** **Posted:** Thu Oct 05, 2006 5:46 pm

offline

Sheep

Joined: Thu Apr 06, 2006 4:29 pm
Posts: 38

> **Jocko Homo wrote:**
>
> How long have I been saying what Gordon is saying? No one pays attention, so I get tired of saying it.
>
> I'll defer to him to keep you guys straight.
>
> Jocko

I was listening. I was planning to try this scheme out with the AD1862 when it comes. Of course, I still need to figure out the missing details. I'd also rather not use such a huge cap in the signal path.

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Jocko Homo **Post subject:** **Posted:** Thu Oct 05, 2006 5:56 pm

offline

Benjamin

Joined: Mon Dec 13, 2004 3:29 pm
Posts: 4270
Location: Somewhere other than here.

OK.....you must be new. You are forgiven.

Jocko

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Gordon **Post subject:** **Posted:** Thu Oct 05, 2006 6:01 pm

offline

Goat

Joined: Tue Jan 31, 2006 4:16 pm
Posts: 572
Location: Zinzinnati, Ohio

Jocko,

Thanks... just what I need. Man I just got a killer review and just released another product today... I will help when I can, but just like Jocko I am not giving away the kitchen sink. You guys will have to lean how to do the plumbing just like we had too.

> **Quote:**
>
> I was listening. I was planning to try this scheme out with the AD1862 when it comes. Of course, I still need to figure out the missing details. I'd also rather not use such a huge cap in the signal path.

What cap? Man if you want to put a transformer in the plate/collector what ever and forget the cap.

You can if you want direct couple all this stuff. You may need to look up servo's and other techniques but it's not rocket science. Just more work!

Thanks
Gordon

_____
Gordon
Chief Scientist
Wavelength Audio

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