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Subject: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Paul Artola](#) on Sun, 17 Dec 2006 17:07:12 GMT

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Neil -

Knowing your music, studio setup, and experience/ability, I think you might consider this advice. You work in a genre that really stresses the core recording resources of a studio, and have been, to an extent, patching together a studio to achieve that sound. But things are not working the way you would like, optimally.

So why not start with a blank slate. Find out what the studios that produce your reference sounds are using to get those sounds and see if you can get a similar subset of gear together to get you in the game.

You might say, "Well, they are using large SSL consoles and racks of vintage preamps and processors and a closet full of expensive mics, and I can't afford that". However, these days, we can buy single channels of Neve, SSL, API, etc., consoles, and software/dsp emulations of virtually every piece of outboard gear ever made. There are a staggering array of mics that are excellent performers for a fraction of the cost of classic German models. And finally, sampling technology has turned live performers into an option and not necessity.

So, I believe the technology is out there to allow you to make your music as you envision it. Just keep in mind that if your current tools aren't cutting it, then its time to move on to new ones. That's how I arrived to the Paris scene over 5 year ago, and may, someday, move on to who-knows-what.

- Paul Artola  
Ellicott City, Maryland

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Nil](#) on Sun, 17 Dec 2006 23:55:31 GMT

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Paul Artola <artola@comcast.net> wrote:

>So why not start with a blank slate. Find out what the studios  
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>together to get you in the game.

Well, there ARE no reference sounds, really - I mean, yeah it's Prog, but I'm not necessarily going for a Rush sound or a Dream

Theater sound or a Yes sound, per se'

>You might say, "Well, they are using large SSL consoles and  
>racks of vintage preamps and processors and a closet full of  
>expensive mics, and I can't afford that".

I have good signal chain compliment, really. Let me show you something... here's a hi-rez mp3 file of 4 comparison clips from two projects that I did in the same genre... one was done on PTHD, tracked with nothing but the best (by most people's estimation) killer mics & pres - vintage Neve's, Focusrite ISA 110's, API's, Summit tube pres & comps, LA2A's) and mixed through an SSL 4000 series console using EFX like two Lexi 480L's, a couple of AMS reverbs & delays, you get the picture. The other was done here with only my own gear (except their instruments & amps, I mean) & tracked & mixed in CubaseSX. Both projects were done at the same samplerate (88.2k), and the four song clips (two clips from each project) are all final mixes, prior to mastering. Check it out...

[http://www.saqqararecords.com/MiscAudio/PTHD-SSL%20vs%20Cuba seSX-ITB.mp3](http://www.saqqararecords.com/MiscAudio/PTHD-SSL%20vs%20Cuba%20seSX-ITB.mp3)

Now, it's not the same songs mixed in different platforms in an a/b comparison, but it's close enough in style, and one of the guitar players & the singer appear on both projects... the 1st & 3rd song clips are the PTHD/SSL mixes; two & four are the Cubase/ITB mixes... dare I say the Cubase mixes sound better? Fuller/more well-defined/bigger.

What do you guys think? Yes? No? Am I nuts?

Problem is, I can't get my OWN music to the right degree of this bigger/more well-defined (not exactly like this other stuff in the clips - it's a different style, but you know what I'm getting at, yes?) place of existence in it's own right.

>So, I believe the technology is out there to allow you to make  
>your music as you envision it. Just keep in mind that if your  
>current tools aren't cutting it, then its time to move on to  
>new ones.

EXACTLY! But, to WHAT?????!!!!?????

Neil

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Don Nafe](#) on Mon, 18 Dec 2006 00:03:26 GMT

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Hey Neil

I'm hearing a definite depth / width issue for sure...sonically you've pretty well nailed it but there are some big differences in the soundscape.

Also the other mixes sound a tad warmer for some reason.

Don

"Neil" <IUOIU@OIU.com> wrote in message news:4585cae3\$1@linux...

>

> Paul Artola <artola@comcast.net> wrote:

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>>that produce your reference sounds are using to get those

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> EXACTLY! But, to WHAT?????!!!!?????  
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> Neil

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Neil](#) on Mon, 18 Dec 2006 01:04:32 GMT  
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"Don Nafe" <[dnafe@magma.ca](mailto:dnafe@magma.ca)> wrote:

>Hey Neil

>  
>I'm hearing a definite depth / width issue for sure...sonically you've  
>pretty well nailed it but there are some big differences in the soundscape.

Elaborate, please... which ones do you like better - clips 1 &  
3 or 2 & 4? Which ones have the better soundscape?

>Also the other mixes sound a tad warmer for some reason.

The PTHD/SSL mixes, you mean?

Neil

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Don Nafe](#) on Mon, 18 Dec 2006 01:37:58 GMT  
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>Neil" <OUIOUI@OI.com> wrote in message news:4585db10\$1@linux...  
>  
> "Don Nafe" <dnafe@magma.ca> wrote:  
>>Hey Neil  
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Hey Neil

1 & 2 if I remember were the better mixes at least on my laptop and headphones (buds)

Sonically 3 & 4 mimic 1 & 2 - the sounds are very similar respectively (1 & 3 / 2 & 4) but there seems to be that "something" that's missing

Now to be fair I too am having a hard time with that "something" and believe it or not the idea of sitting in with a reputable AE during mixdown is looking like a necessity and if it's at all possible I will do it this year.

Anyway back to the differences..the instruments in 1 & 2 seem to have more depth than 3 & 4...and with the additional front to back info I believe you are able to extend things outward more, which is another area 3 & 4 seem to be lacking

does any of this make sense?

Don

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Neil](#) on Mon, 18 Dec 2006 02:51:07 GMT  
[View Forum Message](#) <> [Reply to Message](#)

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"Don Nafe" <dnafe@magma.ca> wrote:  
>Hey Neil  
>  
>1 & 2 if I remember were the better mixes at least on my

>laptop and headphones (buds).

OK, well #1 is a PTHD/SSL console mix and #2 is a CubaseSX/In-The-Box Native mix.

>Sonically 3 & 4 mimic 1 & 2 - the sounds are very similar  
>respectively (1 & 3 / 2 & 4) but there seems to be  
>that "something" that's missing.

OK, but here's the BIG difference, IMO... first of all, the reason I put them in the order I did is that the first two are basically rip-roarers all the way through those sections of each song - good comparison there from one to the other... 3 & 4 are back-to-back for the same kind of reason - both of them have softer parts, and I placed the softer parts leading out of one & into the other. Listen to the section from 1:43 in the file to about 2:27... now, the part from 1:43 'til 2:12 is definitely warmer-sounding... almost has a "70's" feel to it in terms of tonality & the way the delay works with the vocals (that was an AMS delay, BTW); I think it has a great feel, but you can also hear the bandwidth limitations of going out of PTHD via analog into the SSL, because as soon as the next clip comes in at 2:13, listen to the "vertical" expand... what I mean is the bandwidth - Don, if you're listening on a laptop & earbuds, I don't know if you can really tell what I'm talking about - listen on your monitors, burn it to a CD & playback over them or something if you really want to see what I'm saying... even on the hi-rez mp3 you can hear the "vertical" expand as the next clip come in at 2:13.

You guys hearing what I'm talking about? Better defined lows & highs... plus cleaner/better resolution all-around?

Anyone? Bueller? lol

Neil

>Now to be fair I too am having a hard time with that "something" and believe

>it or not the idea of sitting in with a reputable AE during mixdown is  
>looking like a necessity and if it's at all possible I will do it this year.

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>Don  
>  
>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [DJ](#) on Mon, 18 Dec 2006 03:49:15 GMT  
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I like your mixes better.....much better. I'd say you're there amigo.  
Stop sweatin' this and go back to making music. For the genre you're working  
with, you've nailed it. You can relax now and stop chasing this (and  
spending money.)

;o)

"Neil" <IUOIU@OIU.com> wrote in message news:4585cae3\$1@linux...

>  
> Paul Artola <artola@comcast.net> wrote:  
>>So why not start with a blank slate. Find out what the studios  
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---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Neil](#) on Mon, 18 Dec 2006 04:49:32 GMT  
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"DJ" <nowayjose@dude.net> wrote:  
>I like your mixes better.....much better. I'd say you're  
>there amigo.

OK, well they were ALL "my" mixes... the differences were just  
me doing it on PTHD and an SSL out at Sonic Ranch , vs. me  
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>Stop sweatin' this and go back to making music. For the genre  
>you're working with, you've nailed it. You can relax now and



>stop chasing this (and spending money.)

OK, you say so; but check this out... here's another set of comparison clips, back-to-back in one file. Same segment of the same song (my stuff this time) - 3 slightly different versions, neither of which I am 100% happy with (and I'll tell you why later after I hear your feedback) which of the three do you like better, or what kind of comments do you have about each?

<http://saqqararecords.com/MiscAudio/DracoClip-3versions.mp3>

Neil

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [emarenot](#) on Mon, 18 Dec 2006 05:43:00 GMT

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Hey Neil

I think I'm hearing what you're referring to. Clip 3 from about 1:43 to to 2:12 and the first clip both definately have that 70's sound to 'em -warmer -the sound is "tighter" also. (BTW I love the AMS effect -just the exact right amount -and that guy's got great intonation too...) Clips two and four do seem to expand as you mentioned. I'm hearing lots more high end detail along with a nice rich bottom.

If your comments are meant to suggest, in part, that ITB solutions can generate wonderful stuff relative to great outboard gear (SSL, AMS etc..) I agree. I've not got golden ears, and someone will always be able to hear with more sophistication than I, but I think that at the level you're working the differences in the mixes are a matter of taste. Each one of those mixes sounds great, perhaps for different reasons, but they all sit real well on my eardrums.

Thanks for taking the time to upload them for the comparison. I'm gonna try and put up on my studio monitors tomorrow.

MR

"Neil" <OIUOIU@OIU.com> wrote in message news:4585f40b\$1@linux...

>

> "Don Nafe" <dnafe@magma.ca> wrote:

> >Hey Neil

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> >laptop and headphones (buds).

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>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Neil](#) on Mon, 18 Dec 2006 05:48:23 GMT  
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"Mike R." <emarenot@yahoo.com> wrote:

>Hey Neil

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>2:12 and the first clip both definately have that 70's sound to

>'em -warmer -the sound is "tighter" also. (BTW I love the AMS effect -just  
>the exact right amount -and that guy's got great intonation too...)

Yeah, he did good in that part... he's better with intonation  
on the softer stuff - it's when he hits it hard that I need to  
use some Auto-Tune on him... interestingly, though, he doesn't  
like everything tuned perfectly - he likes a few things to  
remain slightly off here & there, and he'll actually pick  
certain specific notes that he likes to remain "off" in pitch  
sometimes.

>Clips two and four do seem to expand as you mentioned. I'm  
>hearing lots more high end detail along with a nice rich  
>bottom.

YEPPERS!

>If your comments are meant to suggest, in part, that ITB  
>solutions can generate wonderful stuff relative to great  
>outboard gear (SSL, AMS etc..) I agree.

Partly, yes, that's part of my intent.

>I think that at the level you're working the differences in  
>the mixes are a matter of taste.

The "level" at which I'm working is miles below the level of any number of perhaps a dozen or so guys on this newsgroup, but I get what you're saying... i.e: none of the mixes completely suck, and the differences might be either personal taste preferences, or choices made at the time that happen to be more appropriate to the task at hand. HOWEVER... when I point out what to listen for, you CAN hear the differences I am referring to... THIS was the point - these are the things I'm noticing.

>Thanks for taking the time to upload them for the comparison.  
>I'm gonna try and put up on my studio monitors tomorrow.

No Prob.. enjoy! If for no other reason than to learn what "NOT" to do! lol

Neil

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [DJ](#) on Mon, 18 Dec 2006 07:05:56 GMT  
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Hmmmm.....mix #2 was my choice. It had more depth and breadth to my ears. ....followed by #3 which I preferred to #1.#1 seemed a bit less 3D and harder around the edges than 2 or 3. All of the were good mixes. None of them sounded harsh or unpleasant.

Deej

.  
"Neil" <OUOIU@OIU.om> wrote in message news:45860fcc\$1@linux...

>

> "DJ" <nowayjose@dude.net> wrote:

>>I like your mixes better.....much better. I'd say you're  
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> <http://saqqararecords.com/MiscAudio/DracoClip-3versions.mp3>  
>  
>  
> Neil

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Neil](#) on Mon, 18 Dec 2006 08:08:25 GMT  
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"DJ" <nowayjose@dude.net> wrote:  
>Hmmm.....mix #2 was my choice. It had more depth and  
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>or 3. All of the were good mixes. None of them sounded harsh  
>or unpleasant.

OK, I'll tell you the differences shortly - I'm hoping to get a few more opinions if anyone's reading. There's no tricks or anything like that... it's just one method vs. another.

Chime in, guys!

Neil

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [erlilo](#) on Mon, 18 Dec 2006 10:50:16 GMT  
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Hmm Neil.... I preferred nr.2, as DeeJ. But my ears have no problems with any of the mixes. All 3 sounded good but in a little different ways. Nr.1 have a little more "tube-old" sound(in my old ears:) but loose something in the bottom, as nr.2. I'm only listening with headphones on my internet machine for the moment, but as allways, it will allways be subjective when we're talking about listening to music.

Erling

"Neil" <OIUIU@OIU.com> skrev i melding news:45863e69\$1 @linux...  
>  
> "DJ" <nowayjose@dude.net> wrote:  
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>  
> Chime in, guys!  
>  
> Neil

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Don Nafe](#) on Mon, 18 Dec 2006 12:50:43 GMT  
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"DJ" <nowayjose@dude.net> wrote in message news:45863b07\$1@linux...  
> Hmmmm.....mix #2 was my choice. It had more depth and breadth to my  
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> and harder around the edges than 2 or 3. All of the were good mixes. None  
> of them sounded harsh or unpleasant.

>  
> Deej  
>

I agree with DJ's accessment of the mixes but I prefer # ...just a personal  
taste thing here #1 just seemed to fit what my ears like to hear.

DOn

..  
> "Neil" <OUOIU@OIU.om> wrote in message news:45860fcc\$1@linux...

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>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Miguel Vigil \[1\]](#) on Mon, 18 Dec 2006 12:52:27 GMT  
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---

#2 is my favourite too. #3 got more detailed keyboards. It lifts the arrangement, but fights a little with the vocal. (At least on my computer-speakers :-).

Bjorn R

"erlilo" <erlilo@nospamonline.no> wrote in message news:45866fcc@linux...  
> Hmm Neil.... I preferred nr.2, as DeeJ. But my ears have no problems with  
> any  
> of the mixes. All 3 sounded good but in a little different ways. Nr.1 have  
> a  
> little more "tube-old" sound(in my old ears:) but loose something in the  
> bottom, as nr.2. I'm only listening with headphones on my internet  
> machine  
> for the moment, but as allways, it will allways be subjective when we're  
> talking about listening to music.  
>  
> Erling  
>  
>  
> "Neil" <OIUIU@OIU.com> skrev i melding news:45863e69\$1@linux...  
>>  
>> "DJ" <nowayjose@dude.net> wrote:  
>>>HmMMM.....mix #2 was my choice. It had more depth and  
>>>breadth to my ears. ....followed by #3 which I preferred to  
>>>#1. #1 seemed a bit less 3D and harder around the edges than 2

> >>or 3. All of the were good mixes. None of them sounded harsh  
> >>or unpleasant.  
> >  
> > OK, I'll tell you the differences shortly - I'm hoping to get a  
> > few more opinions if anyone's reading. There's no tricks or  
> > anything like that... it's just one method vs. another.  
> >  
> > Chime in, guys!  
> >  
> > Neil  
>  
>

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Don Nafe](#) on Mon, 18 Dec 2006 12:59:48 GMT  
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---

You're right Neil

I can definitely hear a difference. in the back to back files now that I have my ears back.

Don

"Neil" <OIUOIU@OIU.com> wrote in message news:4585f40b\$1@linux...

>  
> "Don Nafe" <dnafe@magma.ca> wrote:  
>>Hey Neil  
>>  
>>1 & 2 if I remember were the better mixes at least on my  
>>laptop and headphones (buds).  
>  
> OK, well #1 is a PTHD/SSL console mix and #2 is a CubaseSX/In-  
> The-Box Native mix.  
>  
>  
>>Sonically 3 & 4 mimic 1 & 2 - the sounds are very similar  
>>respectively (1 & 3 / 2 & 4) but there seems to be  
>>that "something" that's missing.  
>  
> OK, but here's the BIG difference, IMO... first of all, the  
> reason I put them in the order I did is that the first two are  
> basically rip-roarers all the way through those sections of  
> each song - good comparison there from one to the other...  
> 3 & 4 are back-to-back for the same kind of reason - both of  
> them have softer parts, and I placed the softer parts leading



> out of one & into the other. Listen to the section from 1:43 in  
> the file to about 2:27... now, the part from 1:43 'til 2:12 is  
> definitely warmer-sounding... almost has a "70's" feel to it  
> in terms of tonality & the way the delay works with the vocals  
> (that was an AMS delay, BTW); I think it has a great feel, but  
> you can also hear the bandwidth limitations of going out of  
> PTHD via analog into the SSL, because as soon as the next clip  
> comes in at 2:13, listen to the "vertical" expand... what I  
> mean is the bandwidth - Don, if you're listening on a laptop &  
> earbuds, I don't know if you can really tell what I'm talking  
> about - listen on your monitors, burn it to a CD & playback  
> over them or something if you really want to see what I'm  
> saying... even on the hi-rez mp3 you can hear the "vertical"  
> expand as the next clip come in at 2:13.  
>  
> You guys hearing what I'm talking about? Better defined lows  
> & highs... plus cleaner/better resolution all-around?  
>  
> Anyone? Bueller? lol  
>  
> Neil  
>  
>  
>  
>  
>  
>>Now to be fair I too am having a hard time with that "something" and  
>>believe  
>  
>>it or not the idea of sitting in with a reputable AE during mixdown is  
>>looking like a necessity and if it's at all possible I will do it this  
>>year.  
>>  
>>Anyway back to the differences..the instruments in 1 & 2 seem to have more  
>  
>>depth than 3 & 4...and with the additional front to back info I believe  
> you  
>>are able to extend things outward more, which is another area 3 & 4 seem  
> to  
>>be lacking  
>>  
>>does any of this make sense?  
>>  
>>Don  
>>  
>>  
>

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Nil](#) on Mon, 18 Dec 2006 15:38:45 GMT

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---

Interesting... OK, here's the difference between the three versions - first of all, all three were ITB Native mixes, NOT using stems or anything like that:

\* #1 is mixed with a BuzzMaxi limiter across the 2-buss, set to -3db threshold. This one to me is the cleanest of the three versions. If I go much beyond -3 on this particular piece, you can really hear the limiting, so -3 is where it remained. I used UV22hr for dither on this one.

\* #2 is the exact same mix, albeit with not one, but THREE BuzzMaxi's in a row strapped across the 2-buss, each set at -1db threshold. This one's still pretty clean, and IMO it provides a bit more power & impact than does mix #1. Again, UV22hr provided the dither algo on this version.

\* #3 is with Izotope Ozone strapped across the 2-buss instead of the BuzzMaxi's... in this case, I used a little bit of compression, a little bit of limiting/volume maximization, and a little bit of the stereo spread section (no exciter or anything else), and used the dither algo in Ozone. Now THIS mix to me has more power, impact & depth, but ALSO - you can hear some distortion or distortion-like artifacts... hear it?

IOW, for my taste, I like mix 3 better EXCEPT for the distortion - now, I was being very conservative on compression, limiting & stereo spread, and although Ozone takes a big chunk of CPU cycles, my CPU meter still had some headroom (this project went from 60% to 80% once I strapped Ozone across the mix) so we know it's not glitching artifacts from overload. I don't know why I'm getting the distortion, but if I could get mix 3 without that, THAT'S what I'd be going for.

It's kinda like when I did the summing comparison files on that other song with Native 2-buss, Native Stems & "Summed in Paris" mixes... I liked a combination of certain aspects of the Native Stems mix & the Summed-in-Paris mix, but I can't get all things hitting at once!

Neil

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Tom Bruhl](#) on Mon, 18 Dec 2006 19:03:34 GMT

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This is a multi-part message in MIME format.

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charset="iso-8859-1"

Content-Transfer-Encoding: quoted-printable

Neil,

I haven't had time to listen but just read all the words here.

It sounds to me like you need to let a great mastering engineer do their magic. That will probably take you to the next level.

Pick the mix that comes closest to your liking. Master to add/subtract the qualities that aren't quite there. The big boys will make that = happen.

This happens to me almost every time. =20

Tom

"Don Nafe" <dnafe@magma.ca> wrote in message news:45868c0f@linux...

"DJ" <nowayjose@dude.net> wrote in message news:45863b07\$1@linux...

> Hmmmm.....mix #2 was my choice. It had more depth and breadth = to my=20

> ears. ....followed by #3 which I preferred to #1.#1 seemed a bit = less 3D=20

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> Deej

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taste thing here #1 just seemed to fit what my ears like to hear.

DOn

.  
> "Neil" <OUOIU@OIU.om> wrote in message news:45860fcc\$1@linux...

>>

>> "DJ" <nowayjose@dude.net> wrote:

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>>>there amigo.  
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I choose Polesoft Lockspam to fight spam, and you?

<http://www.polesoft.com/refer.html>

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-----=\_NextPart\_000\_002D\_01C722AD.4E884AF0--

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [DJ](#) on Mon, 18 Dec 2006 20:32:32 GMT  
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Content-Type: text/plain;

charset="iso-8859-1"

Content-Transfer-Encoding: quoted-printable

Good point Tom.

;o)

"Tom Bruhl" <arpeggio@comcast.net> wrote in message =  
news:4586e364@linux...

Neil,

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Neil<BR>&gt;<BR>&gt; <BR><BR></BLOCKQUOTE>  
<DIV><FONT size=3D2><BR><BR>I choose Polesoft Lockspam to fight spam, =  
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href=3D"http://www.polesoft.com/refer.html">http://www.polesoft.com/refer=  
..html</A>&nbsp;&nbsp;&nbsp;&nbsp;</FONT></DIV></BLOCKQUOTE ></BODY></HTML>  
  
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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [LaMont](#) on Mon, 18 Dec 2006 20:52:51 GMT  
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---

Neil,  
Your test confuses the hell out of me. Reason: You have so many variables (plugins on this) another on that ..What gives??  
On all of your test, none have been on equal footing.  
How about NO plugins on the master bus? Nothing..Then, render the stereo file and see which sounds best. Your test always seems like you're hiding something from us the listeners and it seems that you're always rigging the test towards Cubase SX.

Being a Nuendo owner and user, there is no way in hell that you, me or anybody is going to get a better mix (ITB) over and SSL summed mix .. The Summing bus in SX/ Nuendo is its achilles heel and needs to improve big time, especially for mixing aggressive music (Hard Rock /Hip Hop R & B..) You have to really play it safe with the faders (ITB) mixing those genres..

But, when you're mixing a project over 60 tracks with lots of plugs, the mixing buss starts to suffer. Unlike Paris and Pro Tools, which mix summing busses hold's up very well, Nuendo /SX sounds losses its dept..

What are you going for??

"Neil" <IUOIU@OIU.com> wrote:

>  
>Interesting... OK, here's the difference between the three  
>versions - first of all, all three were ITB Native mixes, NOT  
>using stems or anything like that:  
>  
>\* #1 is mixed with a BuzzMaxi limiter across the 2-buss, set to

>-3db threshold. This one to me is the cleanest of the three  
>versions. If I go much beyond -3 on this particular piece, you  
>can really hear the limiting, so -3 is where it remained.  
>I used UV22hr for dither on this one.  
>  
>\* #2 is the exact same mix, albeit with not one, but THREE  
>BuzzMaxi's in a row strapped across the 2-buss, each set at  
>-1db threshold. This one's still pretty clean, and IMO it  
>provides a bit more power & impact than does mix #1. Again,  
>UV22hr provided the dither algo on this version.  
>  
>\* #3 is with Izotope Ozone strapped across the 2-buss instead  
>of the BuzzMaxi's... in this case, I used a little bit of  
>compression, a little bit of limiting/volume maximization, and  
>a little bit of the stereo spread section (no exciter or  
>anything else), and used the dither algo in Ozone. Now THIS mix  
>to me has more power, impact & depth, but ALSO - you can hear  
>some distortion or distortion-like artifacts... hear it?  
>  
>IOW, for my taste, I like mix 3 better EXCEPT for the  
>distortion - now, I was being very conservative on compression,  
>limiting & stereo spread, and although Ozone takes a big chunk  
>of CPU cycles, my CPU meter still had some headroom (this  
>project went from 60% to 80% once I strapped Ozone across the  
>mix) so we know it's not glitching artifacts from overload.  
>I don't know why I'm getting the distortion, but if I could get  
>mix 3 without that, THAT'S what I'd be going for.  
>  
>It's kinda like when I did the summing comparison files on that  
>other song with Native 2-buss, Native Stems & "Summed in Paris"  
>mixes... I liked a combination of certain aspects of the Native  
>Stems mix & the Summed-in-Paris mix, but I can't get all things  
>hitting at once!  
>  
>Neil

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Neil](#) on Mon, 18 Dec 2006 21:41:38 GMT  
[View Forum Message](#) <> [Reply to Message](#)

"LaMont" <jjdpro@ameritech.net> wrote:

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>Neil,  
>You test confuses the hell out of me. Reason: You have so many variables(plugins  
>on this) another on that ..What gives??

I'm just trying different things on them, Lamont - this wasn't

intended to be a blind a/b test, it's simply a matter of: "here's what I did, here's what I think about the sound of each one; what do you guys think?"

>On of all of your test, none have been on equal footing.  
>How about NO plugins on the master bus? Nothing..Then, render the stereo  
>file and see which sounds best. Your test always seems like you're hiding  
>soemthing from us the listeners and it seems that you;re always rigging  
the  
>test towards Cubase SX.

????? How do you figure? When I did the summing comparisons  
They were all the exact same mix, just summed in different ways -  
I even said that I liked certain aspects of the summed-in-Paris  
mix myself! When I posted the file that had 2 PTHD/SSL mixes & 2  
Cubase Mixes, I would've had to have planned on rigging that  
comparison well over a year ago & would've had to PURPOSELY do  
less than my best efforts on the SSL mixes at the time.

>Being a Neundo owner and user, there is no way in hell that you, me or anybody  
>is going to get a better mix (ITB) over and SSL summed mix ..

So what are you saying... that you think the Cubase mixes sound  
better and that I must've purposely modified the SSL files to  
make them sound worse? Or do you think the Cubase mixes sound  
better and you simply refuse to believe what you're hearing?

Or do you disagree & think that the SSL mixes sound better... in  
which case, I have no issue with your choice - it would simply  
be a matter of personal preference. I'd disagree with you in  
this instance because I happen to think the Cubase ones DO sound  
better.

Lamont, I'm not "rigging" anything - I have no reason to pimp for  
Steinberg or anything like that, nor am I trying to say "my kung-  
fu is better" just to defend my gear choice. I'm trying to find  
out how to get a certain sound out of it, is all.

Neil

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [AlexPlasko](#) on Tue, 19 Dec 2006 03:21:03 GMT  
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---

neil, they all sound good to me .id be happy to work with that caliber of  
talent on a regular basis.the best advice in this thread is to send it out

to a mastering house.different set of ears /perspective,and not so attached to it, etc.

>>Neil,

>>You test confuses the hell out of me. Reason: You have so many

>>variables(plugins

>>on this) another on that ..What gives??

>

> I'm just trying different things on them, Lamont - this wasn't

> intended to be a blind a/b test, it's simply a matter of: "here's

> what I did, here's what I think about the sound of each one;

> what do you guys think?"

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> out how to get a certain sound out of it, is all.

>

> Neil

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [LaMont](#) on Tue, 19 Dec 2006 06:12:40 GMT

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---

"I'd disagree with you in this instance because I happen to think the Cubase ones DO sound better."

Then that SSL Engineer does not know what they are doing with board. There's no way a mix coming off of that board SSL should sound better than a ITB Cubase SX mix..

Sorry, that just does not jive. That engineer does not know how to push he SSL or just not familiar with it.

"Neil" <[oiUOIU@OIU.com](mailto:oiUOIU@OIU.com)> wrote:

>

>"LaMont" <[jjdpro@ameritech.net](mailto:jjdpro@ameritech.net)> wrote:

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---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Nil](#) on Tue, 19 Dec 2006 06:58:00 GMT

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---

"LaMont" <jjdpro@ameritech.net> wrote:

>

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>Sorry, that just does not jive. That engineer does not know how to push  
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>SSL or just not familiar with it.

You're not really paying attention, are you? It was the same engineer (me). And as far as whether or not I know how to use that particular board, I guess that would be a matter of your opinion. I don't think the SSL mixes are bad ones, I think they came out good; I just think that you can hear more detail in the ITB mixes in the examples I gave, and they have more wideband frequency content from top to bottom.

Anyway, my point of that particular comparison wasn't to say



"ITB mixes are better than using a large-format console that costs somewhere in the six-figure range", the point of it was to address a signal-chain suggestion that Paul had... he had suggested perhaps that I needed to pick up a few pieces of killer vintage gear, and I was just demonstrating that I think the various signal chain components that I have here are on par with most anything that can be found in heavy-hitter studios... we used probably around \$100k's worth of mics & pre's on the PTHD/SSL mixes, plus obviously you're looking at another roughly \$100k for that particular console (40-channel E-series, black EQ's, w/G-series Computer & Total Recall package), add in the PTHD, outboard gear & whatnot, and you end up with somewhere around a quarter-mil's worth of equipment involved in that project. The project done at my place was done with my gear, which certainly doesn't tally up to anywhere remotely close to that cost & none of it bears a "vintage" stamp, but it sounds competitive with the project that used all the heavy-hitter stuff.

Neil

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [LaMont](#) on Tue, 19 Dec 2006 17:09:40 GMT  
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---

Hey Neil,

All I'm saying is: All DAW software have their own unique sound. Despite what those lame summing test shows..

PT-HD has a very distinct sound. A very polished sound, with a nice top end, but with full audio spectrum represented. Mixer/Summing buss can be pushed, but you have to watch it.

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Digital Performer: With their hardware, superb audio quality. Full bodied sound .

Sonar: Very flat sounding. I would say that Sonar is your most vanilla sound DW on the market..

Samplitude : A little less top end than Pro Tools. Full bodied 3d sound..

Paris: Dark sounding in comparison to the the other DAWs. But, has a 3d sound quality that's full bodied.

I feel that you asking SX to be something it's not with some analog summing. Especially for your genre of music..

"Neil" <IUOIU@OIU.com> wrote:

>

>"Lamont" <jjdpro@ameritech.net> wrote:

>>

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>  
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---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by Nil on Tue, 19 Dec 2006 18:23:26 GMT  
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---

That's interesting - all those DAW sonic interpretations, I mean... I haven't had a chance to use all of those, so it's good information.

I still don't understand why you consider my summing comparisons "lame", however - it was a fair set of tests; the same mix summed in different ways. Not trying to prove a point or to rig it so one sounded any better than the other - in fact, if you recall the thread, different people liked different summed versions for different reasons... there wasn't any one version that stood out as being "the one" that everyone felt sounded better. The only reason I didn't come right out & say right away which version was which is so that I didn't bias anyone's opinion beforehand by mentioning that... NOT to try & "hide" anything or "trick" anyone, as you accused me of

Sheesh!

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>

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [LaMont](#) on Tue, 19 Dec 2006 19:29:15 GMT

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Hey Neil,

I was not referring to your test as Lame, but rather that popular summing test cd that was sold, that really proved nothing (imho) and BrianT as well. Due to that fact fact that all softwafre behave differently under different circumstances..

"Neil" <IUOIU@OIU.com> wrote:

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [TCB](#) on Tue, 19 Dec 2006 21:51:18 GMT

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---

I'd like to see this proven in a controlled ABY test.

"Lamont" <jjdpro@ameritech.net> wrote:

>

>Hey Neil,

>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [LaMont](#) on Tue, 19 Dec 2006 22:26:05 GMT  
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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [TCB](#) on Tue, 19 Dec 2006 23:01:57 GMT  
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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [LaMont](#) on Wed, 20 Dec 2006 00:05:31 GMT

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Thad, you really can't hear the difference?? Maybe I own too many software  
DAWS thru the years.

Starting on Logic Audio 3.0, then to Cakwalk, Pro Tools, DP, Paris,Acid,  
Neundo, Sonar, samplitude..

I can hear the diference with the same audio interface with the same wav  
file(s)as oon as I import the file or files.

These days, depending on the genre I'm mising determines which DAW software  
I'll use.

My circle of engineer and producer buddies all can hear the difference in  
a second. Just the other day, we were mixing this R&B(ish)Gospel track and  
somebody said, 'Mont, this is begging for Paris. Another track, the call  
was for Pro Tools. And another,Nuendo..

I know BrianT feels and hears the same way in different DAW software. It's  
really obvious..

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Dedric Terry](#) on Wed, 20 Dec 2006 04:12:01 GMT  
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I know we disagree here Lamont and that's totally cool, so I won't take this beyond this one response, and this isn't really directed to you, but my general thoughts on the matter.

In Neil's "defense" (not that he needs it), I and others have done this comparison to death and the conclusion I've come to is that people are 80% influenced by a change in environment (e.g. software interface) and 20% ears. Sorry to say it, but the difference in sound between floating point DAWs is far from real. It's just good, albeit unintentional marketing created by users and capitalized by manufacturers. Perceiving a "sound" in DAWs that in actuality process data identically, is a bad reason to pick a DAW, but of course there is nothing wrong with thinking you hear a difference as long as it doesn't become an unwritten law of engineering at large. Preferring to work with one or the other, and "feeling" better about it for whatever reason is a great reason to pick one DAW over another.

There was a recent thread that Nuendo handled gain through groups differently, so I put Nuendo, Sonar 6 (both 32 and 64-bit engines) and Sequoia 8.3 to the test - identical tests, setup to the 1/100th of a dB identically and came up with absolutely no difference, either audible or scientific. To be honest, this was the one test where I could have said, yes there is an understandable difference between DAWs in a simple math function, and the only one in the DAW that actually might make sense, yet even that did not exist. The reason - math is math. You can paint it red, blue, silver or dull grey, but it's still the same math unless the programmer was high or completely incompetent when they wrote the code.

I thought it was entirely possible the original poster had found something different in Nuendo, but when it came down to really understanding and reproducing what happens in DAW summing and gain structures accurately between each DAW, there was none, nada, nil. The assertion was completely squashed. This also showed me how easy it is for a wide range of professionals to misinterpret digital audio - whether hearing things, or just setting up a test with a single missed variable that completely invalidates the whole process.

If you hear a difference, great. I've thought I heard a difference doing similar comparisons, then changed my perspective (nothing else - not converters, nothing - just reset my expectations, and switched back and forth) and could hear no difference.

Just leave some room for other opinions when you post yours on this subject since it is very obvious that hearing is not as universally objective and identically referenced as everyone might like to believe, and is highly visually and environmentally affected. Some will hear differences in DAWs. There are Cubase SX 3 users claiming Cubase 4 sounds different. Sigh. Then they realize they aren't even using the same project... or at least different EQs, or etc, etc....

Say what you want about published summing tests, but Lynn's tests are as accurate as it gets, and that bears out in the results (all floating point DAWs cancel and sound identical - if you are hearing a difference, you are hearing things that aren't there, or you forgot to align their gain and placement). I've worked with Lynn at least briefly enough to know his attention to detail. In the same way people will disagree about PCs and Macs until neither exists, so will audio engineers disagree about DAWs. This is one debate that will always exist as long as we have different ears, eyes, brains,... and opinions.

What Neil has done is to prove that opinions are always going to differ (i.e. no consensus on the "best" mix of the ones posted). And in truth everyone has a different perception of sound in general - not everyone wants to hear things the same way, so we judge "best" from very different perspectives. There is no single gold standard. There are variations and mutated combinations, but all are subjective. That in and of itself implies very distinctly that people can and will even perceive the exact same sound differently if presented with any variable that changes the brain's interpretation, even if just a visual distraction. Just change the lights in the room and see if you perceive a song differently played back exactly the same way. Or have a cat run across a desk while listening. Whether you care to admit it or not, it is there, and that is actually the beauty of how our sense interact to create perception. That may be our undoing with DAW comparison tests, but it's also what keeps music fresh and creative, when we allow it to.

So my suggestion is to use what makes you most creative, even if it's just a "feeling" working with that DAW gives you - be it the workflow, the GUI, or even the name brand reputation. But, as we all know, if you can't make most any material sound good on whatever DAW you choose, the DAW isn't the problem.

Regards,  
Dedric

"Neil" <IUOIU@OIU.com> wrote:

>  
>That's interesting - all those DAW sonic interpretations, I  
>mean... I haven't had a chance to usee all of those, so it's  
>good information.  
>

>I still don't understand why you consider my summing  
>comparisons "lame", however - it was a fair set of tests;  
>the same mix summed in different ways. Not trying to prove a  
>point or to rig it so one sounded any better than the other - in  
>fact, if you recall the thread, different people liked different  
>summed versions for different reasons... there wasn't any one  
>version that stood out as being "the one" that everyone felt  
>sounded better. The only reason I didn't come right out & say  
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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [TCB](#) on Wed, 20 Dec 2006 15:31:35 GMT

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I'm not convinced I can hear any difference between native systems, with the exception of the last version of ACID I used (way back, I think v. 3) which did sound truly awful. The real test on that one for me was the DAWSUM CD (which I purchased and dutifully scored because I was convinced 'summing' was the real reason PARIS sounded so good) wherein I discovered that I could barely tell one mix from the next even when hearing vastly different systems. Since then I am a skeptic, as opposed to a disbeliever, when I hear that one piece of software sounds greatly better, or even different, than another. I'm not saying some people can't tell some pieces of software from other pieces of software, I'm just saying I'm skeptical one system is 'bright' or 'sharp' or anything else until someone can produce statistically meaningful results in an ABY test.

One of the great things about that DAWSUM CD is it has let me use the software that I like the most, without worrying too much about the sound. That would be Ableton Live most of the time, with SX as a backup if the editing gets more intense. For me that alone was worth the time I spent on the DAWSUM CD.

TCB

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**Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)**  
Posted by [DJ](#) on Wed, 20 Dec 2006 18:11:29 GMT  
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---

>with the exception of the last version of ACID I used (way back, I think v.  
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it sounds pretty awful too. I'm going to run it using Rewire in cubase SX 3  
and lightpipe it to Paris and see if it's the actual ACID audio engine or  
the summing. I've got a feeling it's the audio engine..just a  
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;o)

"TCB" <nobody@ishere.com> wrote in message news:45894947\$1@linux...  
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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [LaMon](#) on Wed, 20 Dec 2006 19:22:43 GMT  
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Hey Dedic and Neil,

I reason I think that the Summing CD test(good intentions) were lame was because.. If a person can;t hear the difference btw a stereo wav file that's in Acid vs Sonar really needs a hearing test.

For reason of my music work, I have to work with different DAWs, so I'm very familiar with their sound qualities. My circle of producers and engineers talk about the daw sonics all the time. It's really no big deal anymore..

The same logic applies when Roger Nichols (a few) years back in his article about master CD's and that he found out that 4 differnt CD burners yeilded

differnt sonic results. Sure, he sated that Math is the Math :) but, his and the masering engineers Ears told them soemthing was different. Hummm???

Now, back to DAW sonics. I can hear the difference btw Paris and Nuendo vs Pro Tools, Logic audio.. There is no math to this, this is an ear thing..You either hear or you don't.. Simple.  
But, good ears can hear it. .

I really think the problem is, noone want to no that their money that they've spent on a given DAW, has sonic limitations or shall we say, just different..

I like that they all sound different. It's good to have choice when mixing a song. Some DAWs, depending on the genre will yield better or the desired results and than another.

EX. I would not mix a Acoustic jazz record today with Paris..reason, I'm going for clarity at it's highest level.. For that project, It's either Neundo or Pro Tools and may Samplitude..Why should I fight with Paris's thick, gooy sonics, when I'm going for clarity. Well, Pro Tools and Nuendo/SX has that sound right out the gate.. Which makes my job a lot easier. simple. This is not tosay that I could not get the job done in Paris..i could..But, for that Acoutic Jazz project , the other 2 daws gives me what I'm looking for without even touching an eq..

This is not all about math. As BrianT states: Use you ears..Forget the math..What does knowing the math do for you anyway? Nothing, it just proves that you know the math. Does not tell you diddly about the sonics.. Just ask Roger Nichols..

"Dedric Terry" <d@nospam.net> wrote:

>

>I know we disagree here Lamont and that's totally cool, so I won't take this

>beyond this one response, and this isn't really directed to you, but my general

>thoughts on the matter.

>

>In Neill's "defense" (not that he needs it), I and others have done this comparison

>to death and the conclusion I've come to is that people are 80% influenced

>by a change in environment (e.g. software interface) and 20% ears. Sorry

>to say it, but the difference in sound between floating point DAWs is far

>from real. It's just good, albeit unintentional marketing created by users

>and capitolized by manufacturers. Perceiving a "sound" in DAWs that in actuality

>process data identically, is a bad reason to pick a DAW, but of course there

>is nothing wrong with thinking you hear a difference as long as it doesn't

>become an unwritten law of engineering at large. Preferring to work with

>one or the other, and "feeling" better about it for whatever reason is a  
>great reason to pick one DAW over another.  
>  
>There was a recent thread that Nuendo handled gain through groups differently,  
>so I put Nuendo, Sonar 6 (both 32 and 64-bit engines) and Sequoia 8.3 to  
>the test - identical tests, setup to the 1/100th of a dB identically and  
>came up with absolutely no difference, either audible or scientific. To  
>be honest, this was the one test where I could have said, yes there is an  
>understandable difference between DAWs in a simple math function, and the  
>only one in the DAW that actually might make sense, yet even that did not  
>exist. The reason - math is math. You can paint it red, blue, silver or  
>dull grey, but it's still the same math unless the programmer was high or  
>completely incompetent when they wrote the code.  
>  
>I thought it was entirely possible the original poster had found something  
>different in Nuendo, but when it came down to really understanding and reproducing  
>what happens in DAW summing and gain structures accurately between each  
>DAW,  
>there was none, nada, nil. The assertion was completely squashed. This also  
>showed me how easy it is for a wide range of professionals to misinterpret  
>digital audio - whether hearing things, or just setting up a test with a  
>single missed variable that completely invalidates the whole process.  
>  
>If you hear a difference, great. I've thought I heard a difference doing  
>similar comparisons, then changed my perspective (nothing else - not converters,  
>nothing - just reset my expectations, and switched back and forth) and could  
>hear no difference.  
>  
>Just leave some room for other opinions when you post yours on this subject  
>since it is very obvious that hearing is not as universally objective and  
>identically referenced as everyone might like to believe, and is highly  
>visually  
>and environmentally affected. Some will hear differences in DAWs. There  
>are Cubase SX 3 users claiming Cubase 4 sounds different. Sigh. Then they  
>realize they aren't even using the same project... or at least different  
>EQs, or etc, etc....  
>  
>Say what you want about published summing tests, but Lynn's tests are as  
>accurate as it gets, and that bears out in the results (all floating point  
>DAWs cancel and sound identical - if you are hearing a difference, you are  
>hearing things that aren't there, or you forgot to align their gain and  
>placement).  
> I've worked with Lynn at least briefly enough to know his attention to  
>detail.  
> In the same way people will disagree about PCs and Macs until neither exists,  
>so will audio engineers disagree about DAWs. This is one debate that will  
>always exist as long as we have different ears, eyes, brains,... and opinions.  
>

>  
>What Neil has done is to prove that opinions are always going to differ  
(i.e.  
>no consensus on the "best" mix of the ones posted). And in truth everyone  
>has a different perception of sound in general - not everyone wants to hear  
>things the same way, so we judge "best" from very different perspectives.  
> There is no single gold standard. There are variations and mutated combinations,  
>but all are subjective. That in and of itself implies very distinctly that  
>people can and will even perceive the exact same sound differently if presented  
>with any variable that changes the brain's interpretation, even if just  
a  
>visual distraction. Just change the lights in the room and see if you perceive  
>a song differently played back exactly the same way. Or have a cat run  
across  
>a desk while listening. Whether you care to admit it or not, it is there,  
>and that is actually the beauty of how our sense interact to create perception.  
> That may be our undoing with DAW comparison tests, but it's also what keeps  
>music fresh and creative, when we allow it to.  
>  
>So my suggestion is to use what makes you most creative, even if it's just  
>a "feeling" working with that DAW gives you - be it the workflow, the GUI,  
>or even the name brand reputation. But, as we all know, if you can't make  
>most any material sound good on whatever DAW you choose, the DAW isn't the  
>problem.  
>  
>Regards,  
>Dedric  
>  
>"Neil" <IUOIU@OIU.com> wrote:  
>>  
>>That's interesting - all those DAW sonic interpretations, I  
>>mean... I haven't had a chance to use all of those, so it's  
>>good information.  
>>  
>>I still don't understand why you consider my summing  
>>comparisons "lame", however - it was a fair set of tests;  
>>the same mix summed in different ways. Not trying to prove a  
>>point or to rig it so one sounded any better than the other - in  
>>fact, if you recall the thread, different people liked different  
>>summed versions for different reasons... there wasn't any one  
>>version that stood out as being "the one" that everyone felt  
>>sounded better. The only reason I didn't come right out & say  
>>right away which version was which is so that I didn't bias  
>>anyone's opinion beforehand by mentioning that... NOT to try  
>>& "hide" anything or "trick" anyone, as you accused me of  
>>  
>>Sheesh!  
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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [LaMont](#) on Wed, 20 Dec 2006 19:24:57 GMT

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---

BrianT use to say all the time..Software has a sound. And I agree with him..

"DJ" <nowayjose@dude.net> wrote:

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>>>>>>>>All I'm saying is: All DAW software have their own unique sound.  
>>>>>>>>Despite  
>>>>>>>>what those lame summing test shows..  
>>>>>>>>  
>>>>>>>>>PT-HD has a very distinct sound. A very polished sound, with a nice  
>> top  
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>>>>>>>>>>Nuendo/SX: Has a very Clear, 2 dimension sound, that does not hype  
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>>>>>>quality that's full bodied.  
>>>>>>  
>>>>>>>I feel that you asking SX to be something it's not with some analog  
>> summing.  
>>>>>>>Especially for your genre of music..  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>"Neil" <IUOIU@OIU.com> wrote:  
>>>>>>>  
>>>>>>>>"Lamont" <jjdpro@ameritech.net> wrote:  
>>>>>>>>  
>>>>>>>>>"I'd disagree with you in this instance because I happen to think  
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>>>>>>>>>>>>engineer (me). And as far as whether or not I know how to use  
>>>>>>>>>>>>that particular board, I guess that would be a matter of  
>>>>>>>>>>>>your opinion. I don't think the SSL mixes are bad ones, I think  
>>>>>>>>>>>>they came out good; I just think that you can hear more detail  
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>>>>>>>>>>>>>>Anyway, my point of that particular comparison wasn't to say  
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>>>>>>>>>>>>>>>suggested perhaps that I needed to pick up a few pieces of  
>>>>>>>>>>>>>>>killer vintage gear, and I was just demonstrating that I think

>>>>>>>the various signal chain components that I have here are on par  
>>>>>>>with most anything that can be found in heavy-hitter studios...  
>>>>>>>we used probably around \$100k's worth of mics & pre's on the  
>>>>>>>PTHD/SSL mixes, plus obviously you're looking at another  
>>>>>>>roughly \$100k for that particular console (40-channel E-series,  
>>>>>>>black EQ's, w/G-series Computer & Total Recall package), add in  
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>>>>>>>somewhere around a quarter-mil's worth of equipment involved in  
>>>>>>>that project. The project done at my place was done with my  
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>>>>>>>close to that cost & none of it bears a "vintage" stamp, but it  
>>>>>>>sounds competitive with the project that used all the heavy-  
>>>>>>>hitter stuff.

>>>>>>>

>>>>>>>Neil

>>>>>>>

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>>>>>>>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Dedric Terry](#) on Wed, 20 Dec 2006 20:51:01 GMT

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Of course Paris sounds different on Lynn's sampler, that was audible, and there are technical reasons why Paris will always sound different, but I didn't like it better on the sampler CD, to be honest, though the differences were subtle. Also, we weren't talking about Acid vs. Sonar specifically. I don't even bother with Acid as a DAW example - it's a loop app. Vegas is a video app that has had life as an audio app to some degree, but iMovie does audio as well, yet that doesn't really put it in the same category as professional DAW apps like Nuendo, PTHD, Sequoia, etc. I use Vegas for video, but not audio.

On Lynn's sampler, Samplitude, Nuendo, Fairlight and the other natives don't sound different and aren't different in the unity gain examples (even the PTHD mix cancels with these). If you hear two files sounding differently that cancel to complete null, an audio difference isn't what you are hearing. When there are differences in non-unity gain mix summing tests, you have an extra variable to account for - how is the gain calculated? Gain is non-linear (power), not adding two numbers together. So how is pan law factored in, and where? Are your faders exactly the same, or 0.001dB

variant?

Also if you drop the same stereo file in two different pro audio apps and hear a difference, one of the two apps is defective. There is nothing happening with a stereo file playback when no gain change or plugins are active - just audio streaming to the driver from disk. If you hear a difference there, I would be quickly trying to find out why. Something is wrong.

The point I am making is that these arguments usually come up as blanket statements with no qualification of what exactly sounds different, why it might, or solid well reasoned attempts to find out why, or if there could be a real difference, or just a perceived one.

Usually the "use your ears" comment comes up when there is no technical rebuttal for when the science and good ears agree. Of course "use your ears" first from a creative perspective, but if you are making a technical, scientific statement, then such comments aren't a good foundation to work from. It's a great motto, but a bit of a cop out in a technical discussion.

Regards,  
Dedric

"LaMont" <jjdpro@ameriech.net> wrote in message news:45897f73\$1@linux...

>

> Hey Dedric and Neil,

>

> I reason I think that the Summing CD test(good intentions) were lame was

> because.. If a person can;t hear the difference btw a stereo wav file

> that's

> in Acid vs Sonar really needs a hearing test.

>

> For reason of my music work, I have to work with different DAWs, so I'm

> very

> familiar with their sound qualities. My circle of producers and engineers

> talk about the daw sonics all the time. It's really no big deal anymore..

>

> The same logic applies when Roger Nichols (a few) years back in his

> article

> about master CD's and that he found out that 4 differnt CD burners yeilded

> differnt sonic results. Sure, he sated that Math is the Math :) but, his

> and the masering engineers Ears told them soemthing was different.

> Hummm???

>

> Now, back to DAW sonics. I can hear the difference btw Paris and Nuendo vs

> Pro Tools, Logic audio.. There is no math to this, this is an ear

> thing.. You

> either hear or you don't.. Simple.  
> But, good ears can hear it. .  
>  
> I really think the problem is, noone want to no that their money that  
> they've  
> spent on a given DAW, has sonic limitations or shall we say, just  
> different..  
>  
> I like that they all sound different. It's good to have choice when mixing  
> a song. Some DAWs, depending on the genre will yield better or the desired  
> results and than another.  
> EX. I would not mix a Acoustic jazz record today with Paris..reason, I'm  
> going for clarity at it's highest level.. For that project, It's either  
> Nuendo  
> or Pro Tools and may Samplitude..Why should I fight with Paris's thick,  
> gooy  
> sonics, when I'm going for clarity. Well, Pro Tools and Nuendo/SX has that  
> sound right out the gate.. Which makes my job a lot easier. simple. This  
> is not tosay that I could not get the job done in Paris..i could..But, for  
> that Acoutic Jazz project , the other 2 daws gives me what I'm looking  
> for  
> without even touching an eq..  
>  
> This is not all about math. As BrianT states: Use you ears..Forget the  
> math..What  
> does knowing the math do for you anyway? Nothing, it just proves that you  
> know the math. Does not tell you diddy about the sonics.. Just ask Roger  
> Nichols..  
>  
>  
> "Dedric Terry" <d@nospam.net> wrote:  
>>  
>>I know we disagree here Lamont and that's totally cool, so I won't take  
> this  
>>beyond this one response, and this isn't really directed to you, but my  
> general  
>>thoughts on the matter.  
>>  
>>In Neil's "defense" (not that he needs it), I and others have done this  
> comparison  
>>to death and the conclusion I've come to is that people are 80% influenced  
>>by a change in environment (e.g. software interface) and 20% ears. Sorry  
>>to say it, but the difference in sound between floating point DAWs is far  
>>from real. It's just good, albeit unintentional marketing created by  
>>users  
>>and capitolized by manufacturers. Perceiving a "sound" in DAWs that in  
> actuality  
>>process data identically, is a bad reason to pick a DAW, but of course



>>there  
>>is nothing wrong with thinking you hear a difference as long as it doesn't  
>>become an unwritten law of engineering at large. Preferring to work with  
>>one or the other, and "feeling" better about it for whatever reason is a  
>>great reason to pick one DAW over another.

>>  
>>There was a recent thread that Nuendo handled gain through groups  
>>differently,  
>>so I put Nuendo, Sonar 6 (both 32 and 64-bit engines) and Sequoia 8.3 to  
>>the test - identical tests, setup to the 1/100th of a dB identically and  
>>came up with absolutely no difference, either audible or scientific. To  
>>be honest, this was the one test where I could have said, yes there is an  
>>understandable difference between DAWs in a simple math function, and the  
>>only one in the DAW that actually might make sense, yet even that did not  
>>exist. The reason - math is math. You can paint it red, blue, silver or  
>>dull grey, but it's still the same math unless the programmer was high or  
>>completely incompetent when they wrote the code.

>>  
>>I thought it was entirely possible the original poster had found something  
>>different in Nuendo, but when it came down to really understanding and  
>>reproducing  
>>what happens in DAW summing and gain structures accurately between each  
> DAW,  
>>there was none, nada, nil. The assertion was completely squashed. This  
>>also  
>>showed me how easy it is for a wide range of professionals to misinterpret  
>>digital audio - whether hearing things, or just setting up a test with a  
>>single missed variable that completely invalidates the whole process.

>>  
>>If you hear a difference, great. I've thought I heard a difference doing  
>>similar comparisons, then changed my perspective (nothing else - not  
>>converters,  
>>nothing - just reset my expectations, and switched back and forth) and  
>>could  
>>hear no difference.

>>  
>>Just leave some room for other opinions when you post yours on this  
>>subject  
>>since it is very obvious that hearing is not as universally objective and  
>>identically referenced as everyone might like to believe, and is highly  
> visually  
>>and environmentally affected. Some will hear differences in DAWs. There  
>>are Cubase SX 3 users claiming Cubase 4 sounds different. Sigh. Then  
>>they  
>>realize they aren't even using the same project... or at least different  
>>EQs, or etc, etc....

>>  
>>Say what you want about published summing tests, but Lynn's tests are as

>>accurate as it gets, and that bears out in the results (all floating point  
>>DAWs cancel and sound identical - if you are hearing a difference, you are  
>>hearing things that aren't there, or you forgot to align their gain and  
> placement).  
>> I've worked with Lynn at least briefly enough to know his attention to  
> detail.  
>> In the same way people will disagree about PCs and Macs until neither  
>> exists,  
>>so will audio engineers disagree about DAWs. This is one debate that will  
>>always exist as long as we have different ears, eyes, brains,... and  
>>opinions.  
>>  
>>  
>>What Neil has done is to prove that opinions are always going to differ  
> (i.e.  
>>no consensus on the "best" mix of the ones posted). And in truth everyone  
>>has a different perception of sound in general - not everyone wants to  
>>hear  
>>things the same way, so we judge "best" from very different perspectives.  
>> There is no single gold standard. There are variations and mutated  
>> combinations,  
>>but all are subjective. That in and of itself implies very distinctly  
>>that  
>>people can and will even perceive the exact same sound differently if  
>>presented  
>>with any variable that changes the brain's interpretation, even if just  
> a  
>>visual distraction. Just change the lights in the room and see if you  
>>perceive  
>>a song differently played back exactly the same way. Or have a cat run  
> across  
>>a desk while listening. Whether you care to admit it or not, it is there,  
>>and that is actually the beauty of how our sense interact to create  
>>perception.  
>> That may be our undoing with DAW comparison tests, but it's also what  
>> keeps  
>>music fresh and creative, when we allow it to.  
>>  
>>So my suggestion is to use what makes you most creative, even if it's just  
>>a "feeling" working with that DAW gives you - be it the workflow, the GUI,  
>>or even the name brand reputation. But, as we all know, if you can't make  
>>most any material sound good on whatever DAW you choose, the DAW isn't the  
>>problem.  
>>  
>>Regards,  
>>Dedric  
>>  
>>"Neil" <IUOIU@OIU.com> wrote:

>>>  
>>>That's interesting - all those DAW sonic interpretations, I  
>>>mean... I haven't had a chance to use all of those, so it's  
>>>good information.  
>>>  
>>>I still don't understand why you consider my summing  
>>>comparisons "lame", however - it was a fair set of tests;  
>>>the same mix summed in different ways. Not trying to prove a  
>>>point or to rig it so one sounded any better than the other - in  
>>>fact, if you recall the thread, different people liked different  
>>>summed versions for different reasons... there wasn't any one  
>>>version that stood out as being "the one" that everyone felt  
>>>sounded better. The only reason I didn't come right out & say  
>>>right away which version was which is so that I didn't bias  
>>>anyone's opinion beforehand by mentioning that... NOT to try  
>>>& "hide" anything or "trick" anyone, as you accused me of  
>>>  
>>>Sheesh!  
>>>  
>>>Neil  
>>>  
>>>  
>>>"Lamont" <jjdpro@ameritech.net> wrote:  
>>>>  
>>>>Hey Neil,  
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>>>>All I'm saying is: All DAW software have their own unique sound.  
>>>>Despite  
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>>>>>>You're not really paying attention, are you? It was the same  
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>>>>>>Anyway, my point of that particular comparison wasn't to say  
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 >>>>Neil  
 >>>>  
 >>>  
 >>  
 >>  
 >

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
 Posted by [TCB](#) on Wed, 20 Dec 2006 21:38:12 GMT  
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That's too bad. I think people have an instinctive thing against the sound of Live as well, just because it also loops like ACID does. Live sounds like a properly written native DAW when working with non time stretched tracks. The sound quality on the stretched audio is amazing, all things considered, but the non-stretched sound is indistinguishable from SX. Too bad the only really truly awful sounding app has to bring down a perfectly nice sounding one.

TCB

"DJ" <nowayjose@dude.net> wrote:

>>with the exception of the last version of ACID I used (way back, I think  
 V.  
 >>3) which did sound truly awful.<  
 >Don't hold your breath hoping ACID will sound any better. I DL'ed V6.0  
 and  
 >it sounds pretty awful too. I'm going to run it using Rewire in cubase SX  
 3  
 >and lightpipe it to Paris and see if it's the actual ACID audio engine or

>the summing. I've got a feeling it's the audio engine..just a  
>feeling.....because I've also got Vegas here and it sucks too.  
>  
>;o)  
>  
>"TCB" <nobody@ishere.com> wrote in message news:45894947\$1@linux...  
>>  
>> I'm not convinced I can hear any difference between native systems, with  
  
>> the  
>> exception of the last version of ACID I used (way back, I think v. 3)  
  
>> which  
>> did sound truly awful. The real test on that one for me was the DAWSUM  
CD  
>> (which I purchased and dutifully scored because I was convinced 'summing'  
>> was the real reason PARIS sounded so good) wherein I discovered that I  
  
>> could  
>> barely tell one mix from the next even when hearing vastly different  
>> systems.  
>> Since then I am a skeptic, as opposed to a disbeliever, when I hear that  
>> one piece of software sounds greatly better, or even different, than  
>> another.  
>> I'm not saying some people can't tell some pieces of software from other  
>> pieces of software, I'm just saying I'm skeptical one system is 'bright'  
>> or 'sharp' or anything else until someone can produce statistically  
>> meaningful  
>> results in an ABY test.  
>>  
>> One of the great things about that DAWSUM CD is it has let me use the  
  
>> software  
>> that I like the most, without worrying too much about the sound. That  
  
>> would  
>> be Ableton Live most of the time, with SX as a backup if the editing gets  
>> more intense. For me that alone was worth the time I spent on the DAWSUM  
>> CD.  
>>  
>> TCB  
>>  
>> "LaMont" <jjdpro@ameritech.net> wrote:  
>>>  
>>>Thad, you really can't hear the difference?? Maybe I own too many software  
>>>DAWS thru the years.  
>>>  
>>>Starting on Logic Audio 3.0, then to Cakwalk, Pro Tools, DP, Paris,Acid,

>>>Neundo, Sonar, samplitude..  
>>>  
>>>I can hear the diferece with the same audio interface with the same wav  
>>>file(s)as oon as I import the file or files.  
>>>  
>>>These days, depending on the genre I'm mising determines which DAW  
>>>software  
>>>I'll use.  
>>>My circle of engineer and producer buddies all can hear the difference  
in  
>>>a second. Just the other day, we were mixing this R&B(ish)Gospel track  
and  
>>>somebody said, 'Mont, this is begging for Paris. Another track, the call  
>>>was for Pro Tools. And another,Nuendo..  
>>>I know BrianT feels and hears the same way in different DAW software.  
It's  
>>>really obvious..  
>>>  
>>>  
>>>"TCB" <nobody@ishere.com> wrote:  
>>>>  
>>>>Which is why ABY testing uses expert listeners instead of scopes and  
  
>>>>graphs.  
>>>>  
>>>>  
>>>>I'm not saying you're wrong, esp. about ITB vs external summing. One  
  
>>>>would  
>>>>expect that to sound at least slightly different. But I would be  
>>>>absolutely  
>>>>shocked if anyone could tell in a controlled ABY test whether they were  
>>>listening  
>>>>to SX, Performer, of Sonar.  
>>>>  
>>>>"LaMont" <jjdpro@ameritech.net> wrote:  
>>>>>  
>>>>>The only real test is with the ears and not scopes and graphs.  
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>>>>>"TCB" <nobody@ishere.com> wrote:  
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>>>>>>I'd like to see this proven in a controlled ABY test.  
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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [LaMontt](#) on Wed, 20 Dec 2006 22:21:56 GMT

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Agreed..

"TCB" <nobody@ishere.com> wrote:

>  
>That's too bad. I think people have an instinctive thing against the sound  
>of Live as well, just because it also loops like ACID does. Live sounds  
like  
>a properly written native DAW when working with non time stretched tracks.  
>The sound quality on the stretched audio is amazing, all things considered,  
>but the non-stretched sound is indistinguishable from SX. Too bad the only  
>really truly awful sounding app has to bring down a perfectly nice sounding  
>one.

>  
>TCB

>  
>"DJ" <nowayjose@dude.net> wrote:  
>>>with the exception of the last version of ACID I used (way back, I think  
>v.

>>>3) which did sound truly awful.<  
>>Don't hold your breath hoping ACID will sound any better. I DL'ed V6.0  
>and

>>it sounds pretty awful too. I'm going to run it using Rewire in cubase  
SX  
>3

>>and lightpipe it to Paris and see if it's the actual ACID audio engine  
or

>  
>>the summing. I've got a feeling it's the audio engine..just a  
>>feeling.....because I've also got Vegas here and it sucks too.

>>  
>>;o)

>>  
>>"TCB" <nobody@ishere.com> wrote in message news:45894947\$1@linux...

>>>  
>>> I'm not convinced I can hear any difference between native systems, with

>  
>>> the  
>>> exception of the last version of ACID I used (way back, I think v. 3)  
>  
>>> which  
>>> did sound truly awful. The real test on that one for me was the DAWSUM  
>CD  
>>> (which I purchased and dutifully scored because I was convinced 'summing'  
>>> was the real reason PARIS sounded so good) wherein I discovered that  
I  
>  
>>> could  
>>> barely tell one mix from the next even when hearing vastly different  
  
>>> systems.  
>>> Since then I am a skeptic, as opposed to a disbeliever, when I hear that  
>>> one piece of software sounds greatly better, or even different, than  
  
>>> another.  
>>> I'm not saying some people can't tell some pieces of software from other  
>>> pieces of software, I'm just saying I'm skeptical one system is 'bright'  
>>> or 'sharp' or anything else until someone can produce statistically  
>>> meaningful  
>>> results in an ABY test.  
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>>> One of the great things about that DAWSUM CD is it has let me use the  
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>>> that I like the most, without worrying too much about the sound. That  
>  
>>> would  
>>> be Ableton Live most of the time, with SX as a backup if the editing  
gets  
>>> more intense. For me that alone was worth the time I spent on the DAWSUM  
>>> CD.  
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>>> "LaMont" <jjdpro@ameritech.net> wrote:  
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>>>>Thad, you really can't hear the difference?? Maybe I own too many software  
>>>>DAWS thru the years.  
>>>>  
>>>>Starting on Logic Audio 3.0, then to Cakwalk, Pro Tools, DP, Paris,Acid,  
>>>>Neundo, Sonar, samplitude..  
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>>>>I can hear the diference with the same audio interface with the same  
wav

>>>>file(s)as oon as I import the file or files.  
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>>>>These days, depending on the genre I'm mising determines which DAW  
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>>>>I'll use.  
>>>>My circle of engineer and producer buddies all can hear the difference  
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>>>>somebody said, 'Mont, this is begging for Paris. Another track, the call  
>>>>was for Pro Tools. And another,Nuendo..  
>>>>I know BrianT feels and hears the same way in different DAW software.  
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>>>>>>>>Hey Neil,  
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>>>>>>>>>>All I'm saying is: All DAW software have their own unique sound.

>>>>>>>>>>Despite  
>>>>>>>>>>>what those lame summing test shows..

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>>>>>>>PT-HD has a very distinct sound. A very polished sound, with a nice  
>>> top  
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>>>>>>>but with full audio spectrum represented. Mixer/Summing buss can  
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>>>>>>>"Neil" <IUOIU@OIU.com> wrote:  
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>>>>>>>>  
>>>>>>>>"I'd disagree with you in this instance because I happen to think  
>>> the  
>>>>>>>Cubase  
>>>>>>>>ones DO sound better."  
>>>>>>>>  
>>>>>>>>Then that SSL Engineer does not know what they are doing with board.  
>>>>>>>>There's  
>>>>>>>>no way a mix coming off of that board SSL should sound better than  
>>>>a  
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>>>>>>>>engineer (me). And as far as whether or not I know how to use  
>>>>>>>>that particular board, I guess that would be a matter of  
>>>>>>>>your opinion. I don't think the SSL mixes are bad ones, I think  
>>>>>>>>they came out good; I just think that you can hear more detail  
>>>>>>>>in the ITB mixes in the examples I gave, and they have more  
>>>>>>>>wideband frequency content from top to bottom.  
>>>>>>>>  
>>>>>>>>Anyway, my point of that particular comparison wasn't to say  
>>>>>>>>"ITB mixes are better than using a large-format console that  
>>>>>>>>costs somewhere in the six-figure range", the point of it was to  
>>>>>>>>address a signal-chain suggestion that Paul had... he had  
>>>>>>>>suggested perhaps that I needed to pick up a few pieces of  
>>>>>>>>killer vintage gear, and I was just demonstrating that I think  
>>>>>>>>the various signal chain components that I have here are on par  
>>>>>>>>with most anything that can be found in heavy-hitter studios...  
>>>>>>>>we used probably around \$100k's worth of mics & pre's on the  
>>>>>>>>PTHD/SSL mixes, plus obviously you're looking at another  
>>>>>>>>roughly \$100k for that particular console (40-channel E-series,  
>>>>>>>>black EQ's, w/G-series Computer & Total Recall package), add in  
>>>>>>>>the PTHD, outboard gear & whatnot, and you end up with  
>>>>>>>>somewhere around a quarter-mil's worth of equipment involved in  
>>>>>>>>that project. The project done at my place was done with my  
>>>>>>>>gear, which certainly doesn't tally up to anywhere remotely  
>>>>>>>>close to that cost & none of it bears a "vintage" stamp, but it  
>>>>>>>>sounds competitive with the project that used all the heavy-  
>>>>>>>>hitter stuff.  
>>>>>>>>  
>>>>>>>>Neil



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>>>>>>>>>"ITB mixes are better than using a large-format console that



We I and other say.. We drop a stereo wav file in a given daw)(unity gain) using the same audio converter...We can hear the diference. And it's sonically obvious..

Lynns test is flawed because of the Roger Nicohls CD mastering problem. Things change when going to render to CD.

Hey some people on this earth can hear and see better than others..That's just a fact

"Dedric Terry" <dedric@echomg.com> wrote:

>Of course Paris sounds different on Lynn's sampler, that was audible, and

>there are technical reasons why Paris will always sound different, but I

>didn't like it better on the sampler CD, to be honest, though the  
>differences were subtle. Also, we weren't talking about Acid vs. Sonar

>specifically. I don't even bother with Acid as a DAW example - it's a loop

>app. Vegas is a video app that has had life as an audio app to some degree,

>but iMovie does audio as well, yet that doesn't really put it in the same

>category as professional DAW apps like Nuendo, PTHD, Sequoia, etc. I use

>Vegas for video, but not audio.

>

>On Lynn's sampler, Samplitude, Nuendo, Fairlight and the other natives don't

>sound different and aren't different in the unity gain examples

>(even the PTHD mix cancels with these). If you hear two files sounding

>differently that cancel to complete null, an audio difference isn't what  
you

>are hearing. When there are differences in non-unity gain mix summing

>tests, you have an extra variable to account for - how is the gain

>calculated? Gain

>is non-linear (power), not adding two numbers together. So how is pan law

>factored in, and where? Are your faders exactly the same, or 0.001dB

>variant?

>

>Also if you drop the same stereo file in two different pro audio apps and

>hear a difference, one of the two apps is defective. There is nothing

>happening with a stereo file playback when no gain change or plugins are

>active - just audio streaming to the driver from disk. If you hear a  
>difference there, I would be quickly trying to find out why. Something  
is  
>wrong.  
>  
>The point I am making is that these arguments usually come up as blanket  
  
>statements with no qualification of what exactly sounds  
>different, why it might, or solid well reasoned attempts to find out why,  
or  
>if there could be a real difference, or just a perceived one.  
>  
>Usually the "use your ears" comment comes up when there is no technical  
  
>rebuttal for when the science and good  
>ears agree. Of course "use your ears" first from a creative perspective,  
  
>but if you are making a technical, scientific statement, then such comments  
>aren't a good foundation to work from. It's a great motto, but a bit of  
a  
>cop out in a technical discussion.  
>  
>Regards,  
>Dedric  
>  
>"LaMont" <jjdpro@ameriech.net> wrote in message news:45897f73\$1@linux...  
>>  
>> Hey Dedric and Neil,  
>>  
>> I reason I think that the Summing CD test(good intentions) were lame was  
>> because.. If a person can;t hear the difference btw a stereo wav file  
  
>> that's  
>> in Acid vs Sonar really needs a hearing test.  
>>  
>> For reason of my music work, I have to work with different DAWs, so I'm  
  
>> very  
>> familiar with their sound qualities. My circle of producers and engineers  
>> talk about the daw sonics all the time. It's really no big deal anymore..  
>>  
>> The same logic applies when Roger Nichols (a few) years back in his  
>> article  
>> about master CD's and that he found out that 4 differnt CD burners yeilded  
>> differnt sonic results. Sure, he sated that Math is the Math :) but, his  
>> and the masering engineers Ears told them soemthing was different.  
>> Hummm???

>>  
>> Now, back to DAW sonics. I can hear the difference btw Paris and Nuendo  
vs  
>> Pro Tools, Logic audio.. There is no math to this, this is an ear  
>> thing..You  
>> either hear or you don't.. Simple.  
>> But, good ears can hear it. .  
>>  
>> I really think the problem is, noone want to no that their money that  
  
>> they've  
>> spent on a given DAW, has sonic limitations or shall we say, just  
>> different..  
>>  
>> I like that they all sound different. It's good to have choice when mixing  
>> a song. Some DAWs, depending on the genre will yield better or the desired  
>> results and than another.  
>> EX. I would not mix a Acoustic jazz record today with Paris..reason, I'm  
>> going for clarity at it's highest level.. For that project, It's either  
  
>> Neundo  
>> or Pro Tools and may Samplitude..Why should I fight with Paris's thick,  
  
>> gooy  
>> sonics, when I'm going for clarity. Well, Pro Tools and Nuendo/SX has  
that  
>> sound right out the gate.. Which makes my job a lot easier. simple. This  
>> is not tosay that I could not get the job done in Paris..i could..But,  
for  
>> that Acoutic Jazz project , the other 2 daws gives me what I'm looking  
  
>> for  
>> without even touching an eq..  
>>  
>> This is not all about math. As BrianT states: Use you ears..Forget the  
  
>> math..What  
>> does knowing the math do for you anyway? Nothing, it just proves that  
you  
>> know the math. Does not tell you diddly about the sonics.. Just ask Roger  
>> Nichols..  
>>  
>>  
>> "Dedric Terry" <d@nospam.net> wrote:  
>>>  
>>>I know we disagree here Lamont and that's totally cool, so I won't take  
>> this  
>>>beyond this one response, and this isn't really directed to you, but my

>> general  
>>> thoughts on the matter.  
>>>  
>>> In Neil's "defense" (not that he needs it), I and others have done this  
>> comparison  
>>> to death and the conclusion I've come to is that people are 80% influenced  
>>> by a change in environment (e.g. software interface) and 20% ears. Sorry  
>>> to say it, but the difference in sound between floating point DAWs is  
far  
>>> from real. It's just good, albeit unintentional marketing created by  
  
>>> users  
>>> and capitulated by manufacturers. Perceiving a "sound" in DAWs that in  
>> actuality  
>>> process data identically, is a bad reason to pick a DAW, but of course  
  
>>> there  
>>> is nothing wrong with thinking you hear a difference as long as it doesn't  
>>> become an unwritten law of engineering at large. Preferring to work with  
>>> one or the other, and "feeling" better about it for whatever reason is  
a  
>>> great reason to pick one DAW over another.  
>>>  
>>> There was a recent thread that Nuendo handled gain through groups  
>>> differently,  
>>> so I put Nuendo, Sonar 6 (both 32 and 64-bit engines) and Sequoia 8.3  
to  
>>> the test - identical tests, setup to the 1/100th of a dB identically and  
>>> came up with absolutely no difference, either audible or scientific.  
To  
>>> be honest, this was the one test where I could have said, yes there is  
an  
>>> understandable difference between DAWs in a simple math function, and  
the  
>>> only one in the DAW that actually might make sense, yet even that did  
not  
>>> exist. The reason - math is math. You can paint it red, blue, silver  
or  
>>> dull grey, but it's still the same math unless the programmer was high  
or  
>>> completely incompetent when they wrote the code.  
>>>  
>>> I thought it was entirely possible the original poster had found something  
>>> different in Nuendo, but when it came down to really understanding and  
  
>>> reproducing  
>>> what happens in DAW summing and gain structures accurately between each  
>> DAW,



>>>there was none, nada, nil. The assertion was completely squashed. This

>>>also

>>>showed me how easy it is for a wide range of professionals to misinterpret

>>>digital audio - whether hearing things, or just setting up a test with

a

>>>single missed variable that completely invalidates the whole process.

>>>

>>>If you hear a difference, great. I've thought I heard a difference doing

>>>similar comparisons, then changed my perspective (nothing else - not

>>>converters,

>>>nothing - just reset my expectations, and switched back and forth) and

>>>could

>>>hear no difference.

>>>

>>>Just leave some room for other opinions when you post yours on this

>>>subject

>>>since it is very obvious that hearing is not as universally objective

and

>>>identically referenced as everyone might like to believe, and is highly

>> visually

>>>and environmentally affected. Some will hear differences in DAWs. There

>>>are Cubase SX 3 users claiming Cubase 4 sounds different. Sigh. Then

>>>they

>>>realize they aren't even using the same project... or at least different

>>>EQs, or etc, etc....

>>>

>>>Say what you want about published summing tests, but Lynn's tests are

as

>>>accurate as it gets, and that bears out in the results (all floating point

>>>DAWs cancel and sound identical - if you are hearing a difference, you

are

>>>hearing things that aren't there, or you forgot to align their gain and

>> placement).

>>> I've worked with Lynn at least briefly enough to know his attention to

>> detail.

>>> In the same way people will disagree about PCs and Macs until neither

>>> exists,

>>>so will audio engineers disagree about DAWs. This is one debate that

will

>>>always exist as long as we have different ears, eyes, brains,... and

>>>opinions.

>>>

>>>

>>>What Neil has done is to prove that opinions are always going to differ

>> (i.e.  
>>>no consensus on the "best" mix of the ones posted). And in truth everyone  
>>>has a different perception of sound in general - not everyone wants to  
  
>>>hear  
>>>things the same way, so we judge "best" from very different perspectives.  
>>> There is no single gold standard. There are variations and mutated  
>>> combinations,  
>>>but all are subjective. That in and of itself implies very distinctly  
  
>>>that  
>>>people can and will even perceive the exact same sound differently if  
  
>>>presented  
>>>with any variable that changes the brain's interpretation, even if just  
>> a  
>>>visual distraction. Just change the lights in the room and see if you  
  
>>>perceive  
>>>a song differently played back exactly the same way. Or have a cat run  
>> across  
>>>a desk while listening. Whether you care to admit it or not, it is there,  
>>>and that is actually the beauty of how our sense interact to create  
>>>perception.  
>>> That may be our undoing with DAW comparison tests, but it's also what  
  
>>> keeps  
>>>music fresh and creative, when we allow it to.  
>>>  
>>>So my suggestion is to use what makes you most creative, even if it's  
just  
>>>a "feeling" working with that DAW gives you - be it the workflow, the  
GUI,  
>>>or even the name brand reputation. But, as we all know, if you can't  
make  
>>>most any material sound good on whatever DAW you choose, the DAW isn't  
the  
>>>problem.  
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>>>Regards,  
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>>>"Neil" <IUOIU@OIU.com> wrote:  
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>>>>That's interesting - all those DAW sonic interpretations, I  
>>>>mean... I haven't had a chance to use all of those, so it's  
>>>>good information.  
>>>>

>>>>I still don't understand why you consider my summing  
>>>>comparisons "lame", however - it was a fair set of tests;  
>>>>the same mix summed in different ways. Not trying to prove a  
>>>>point or to rig it so one sounded any better than the other - in  
>>>>fact, if you recall the thread, different people liked different  
>>>>summed versions for different reasons... there wasn't any one  
>>>>version that stood out as being "the one" that everyone felt  
>>>>sounded better. The only reason I didn't come right out & say  
>>>>right away which version was which is so that I didn't bias  
>>>>anyone's opinion beforehand by mentioning that... NOT to try  
>>>>& "hide" anything or "trick" anyone, as you accused me of  
>>>>  
>>>>Sheesh!  
>>>>  
>>>>Neil  
>>>>  
>>>>  
>>>>"Lamont" <jjdpro@ameritech.net> wrote:  
>>>>>  
>>>>>Hey Neil,  
>>>>>  
>>>>>All I'm saying is: All DAW software have their own unique sound.  
>>>>>Despite  
>>>>>what those lame summing test shows..  
>>>>>  
>>>>>PT-HD has a very distinct sound. A very polished sound, with a nice  
top  
>>>>>end,  
>>>>>but with full audio spectrum represented. Mixer/Summing buss can be  
  
>>>>>pushed,  
>>>>>but you have to watch it.  
>>>>>  
>>>>>Nuendo/SX: Has a very Clear, 2 dimension sound, that does not hype the  
>>>top  
>>>>>nor bottom end.  
>>>>>  
>>>>>Logic Audio: Very Broad- Aggressive sound, that really works for Rock  
>> and  
>>>>>R & B/Gospel mixes.  
>>>>>  
>>>>>Digital Performer: With their hardware, superb audio quality. Full  
>>>>>bodied  
>>>>>sound .  
>>>>>  
>>>>>Sonar: Very flat sounding. I would say that Sonar is your most vanilla  
>>>sound  
>>>>>DW on the market..

>>>>  
>>>>Samplitude : A little less top end than Pro Tools. Full bodied 3d  
>>>>sound..  
>>>>  
>>>>Paris: Dark sounding in comparison to the the other DAWs. But, has a  
3d  
>>>>sound  
>>>>quality that's full bodied.  
>>>>  
>>>>I feel that you asking SX to be something it's not with some analog  
  
>>>>summing.  
>>>>Especially for your genre of music..  
>>>>  
>>>>  
>>>>  
>>>>  
>>>>"Neil" <IUOIU@OIU.com> wrote:  
>>>>>  
>>>>>"Lamont" <jjdpro@ameritech.net> wrote:  
>>>>>>  
>>>>>>"I'd disagree with you in this instance because I happen to think  
the  
>>>>Cubase  
>>>>>>ones DO sound better."  
>>>>>>  
>>>>>>Then that SSL Engineer does not know what they are doing with board.  
>>>>There's  
>>>>>>no way a mix coming off of that board SSL should sound better than  
a  
>>>>ITB  
>>>>>>Cubase SX mix..  
>>>>>>  
>>>>>>Sorry, that just does not jive. That engineer does not know how to  
  
>>>>>>push  
>>>>>>he  
>>>>>>SSL or just not familiar with it.  
>>>>>>  
>>>>>>You're not really paying attention, are you? It was the same  
>>>>>>engineer (me). And as far as whether or not I know how to use  
>>>>>>that particular board, I guess that would be a matter of  
>>>>>>your opinion. I don't think the SSL mixes are bad ones, I think  
>>>>>>they came out good; I just think that you can hear more detail  
>>>>>>in the ITB mixes in the examples I gave, and they have more  
>>>>>>wideband frequency content from top to bottom.  
>>>>>>  
>>>>>>Anyway, my point of that particular comparison wasn't to say

>>>>>"ITB mixes are better than using a large-format console that  
>>>>>costs somewhere in the six-figure range", the point of it was to  
>>>>>address a signal-chain suggestion that Paul had... he had  
>>>>>suggested perhaps that I needed to pick up a few pieces of  
>>>>>killer vintage gear, and I was just demonstrating that I think  
>>>>>the various signal chain components that I have here are on par  
>>>>>with most anything that can be found in heavy-hitter studios...  
>>>>>we used probably around \$100k's worth of mics & pre's on the  
>>>>>PTHD/SSL mixes, plus obviously you're looking at another  
>>>>>roughly \$100k for that particular console (40-channel E-series,  
>>>>>black EQ's, w/G-series Computer & Total Recall package), add in  
>>>>>the PTHD, outboard gear & whatnot, and you end up with  
>>>>>somewhere around a quarter-mil's worth of equipment involved in  
>>>>>that project. The project done at my place was done with my  
>>>>>gear, which certainly doesn't tally up to anywhere remotely  
>>>>>close to that cost & none of it bears a "vintage" stamp, but it  
>>>>>sounds competitive with the project that used all the heavy-  
>>>>>hitter stuff.

>>>>>

>>>>>Neil

>>>>>

>>>>

>>>

>>

>

>

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [LaMont](#) on Thu, 21 Dec 2006 01:14:35 GMT

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---

Lol!!! :)

"TCB" <nobody@ishere.com> wrote:

>

>Well, hey, at least we can agree that Live sounds good.

>

>I'm really psyched for my Live/Scope setup. The Core Duo desktop is set up

>and running nicely (what a change from a three year old Athlon) so I'll have

>gobs of native f/x and instruments, UAD-1 plugs, and Scope synths/effects/mixing.

>Then I will officially be 100% at fault if I suck ;-)

>

>TCB

>

>"LaMont" <jjdpro@gmail.com> wrote:

>>  
>>Agreed..  
>>"TCB" <nobody@ishere.com> wrote:  
>>>  
>>>That's too bad. I think people have an instinctive thing against the sound  
>>>of Live as well, just because it also loops like ACID does. Live sounds  
>>like  
>>>a properly written native DAW when working with non time stretched tracks.  
>>>The sound quality on the stretched audio is amazing, all things considered,  
>>>but the non-stretched sound is indistinguishable from SX. Too bad the  
only  
>>>really truly awful sounding app has to bring down a perfectly nice sounding  
>>>one.  
>>>  
>>>TCB  
>>>  
>>>"DJ" <nowayjose@dude.net> wrote:  
>>>>>with the exception of the last version of ACID I used (way back, I think  
>>>>v.  
>>>>>3) which did sound truly awful.<  
>>>>Don't hold your breath hoping ACID will sound any better. I DL'ed V6.0  
>>>>and  
>>>>it sounds pretty awful too. I'm going to run it using Rewire in cubase  
>>SX  
>>>3  
>>>>and lightpipe it to Paris and see if it's the actual ACID audio engine  
>>or  
>>>  
>>>>the summing. I've got a feeling it's the audio engine..just a  
>>>>feeling.....because I've also got Vegas here and it sucks too.  
>>>>  
>>>>;o)  
>>>>  
>>>>"TCB" <nobody@ishere.com> wrote in message news:45894947\$1@linux...  
>>>>>  
>>>>> I'm not convinced I can hear any difference between native systems,  
>with  
>>>  
>>>>> the  
>>>>> exception of the last version of ACID I used (way back, I think v.  
3)  
>>>  
>>>>> which  
>>>>> did sound truly awful. The real test on that one for me was the DAWSUM  
>>>>CD  
>>>>> (which I purchased and dutifully scored because I was convinced 'summing'  
>>>>> was the real reason PARIS sounded so good) wherein I discovered that  
>>I

>>>  
>>>> could  
>>>> barely tell one mix from the next even when hearing vastly different  
>>  
>>>> systems.  
>>>> Since then I am a skeptic, as opposed to a disbeliever, when I hear  
>that  
>>>> one piece of software sounds greatly better, or even different, than  
>>  
>>>> another.  
>>>> I'm not saying some people can't tell some pieces of software from  
other  
>>>> pieces of software, I'm just saying I'm skeptical one system is 'bright'  
>>>> or 'sharp' or anything else until someone can produce statistically  
>  
>>>> meaningful  
>>>> results in an ABY test.  
>>>>  
>>>> One of the great things about that DAWSUM CD is it has let me use the  
>>>  
>>>> software  
>>>> that I like the most, without worrying too much about the sound. That  
>>>  
>>>> would  
>>>> be Ableton Live most of the time, with SX as a backup if the editing  
>>gets  
>>>> more intense. For me that alone was worth the time I spent on the DAWSUM  
>>>> CD.  
>>>>  
>>>> TCB  
>>>>  
>>>> "LaMont" <jjdpro@ameritech.net> wrote:  
>>>>>  
>>>>>Thad, you really can't hear the difference?? Maybe I own too many software  
>>>>>DAWS thru the years.  
>>>>>  
>>>>>Starting on Logic Audio 3.0, then to Cakwalk, Pro Tools, DP, Paris,Acid,  
>>>>>Neundo, Sonar, samplitude..  
>>>>>  
>>>>>I can hear the diference with the same audio interface with the same  
>>wav  
>>>>>file(s)as oon as I import the file or files.  
>>>>>  
>>>>>These days, depending on the genre I'm mising determines which DAW  
  
>>>>>software  
>>>>>I'll use.  
>>>>>My circle of engineer and producer buddies all can hear the difference

>>>in  
>>>>>a second. Just the other day, we were mixing this R&B(ish)Gospel track  
>>>and  
>>>>>somebody said, 'Mont, this is begging for Paris. Another track, the  
>call  
>>>>>was for Pro Tools. And another, Nuendo..  
>>>>>I know BrianT feels and hears the same way in different DAW software.  
>>>It's  
>>>>>really obvious..  
>>>>>  
>>>>>  
>>>>>"TCB" <nobody@ishere.com> wrote:  
>>>>>  
>>>>>>Which is why ABY testing uses expert listeners instead of scopes and  
>>>  
>>>>>>graphs.  
>>>>>>  
>>>>>>  
>>>>>>>I'm not saying you're wrong, esp. about ITB vs external summing. One  
>>>  
>>>>>>>would  
>>>>>>>expect that to sound at least slightly different. But I would be  
>>>>>>>absolutely  
>>>>>>>shocked if anyone could tell in a controlled ABY test whether they  
>were  
>>>>>>listening  
>>>>>>>to SX, Performer, of Sonar.  
>>>>>>>  
>>>>>>>"LaMont" <jjdpro@ameritech.net> wrote:  
>>>>>>>  
>>>>>>>>The only real test is with the ears and not scopes and graphs.  
>>>>>>>>  
>>>>>>>>>"TCB" <nobody@ishere.com> wrote:  
>>>>>>>>>  
>>>>>>>>>>I'd like to see this proven in a controlled ABY test.  
>>>>>>>>>>  
>>>>>>>>>>>"Lamont" <jjdpro@ameritech.net> wrote:  
>>>>>>>>>>>  
>>>>>>>>>>>>Hey Neil,  
>>>>>>>>>>>>  
>>>>>>>>>>>>>>All I'm saying is: All DAW software have their own unique sound.  
>>>  
>>>>>>>>>>>>>Despite  
>>>>>>>>>>>>>>>what those lame summing test shows..  
>>>>>>>>>>>>>>>  
>>>>>>>>>>>>>>>>>PT-HD has a very distinct sound. A very polished sound, with a  
>nice  
>>>>> top



>>>>>>>end,  
>>>>>>>but with full audio spectrum represented. Mixer/Summing buss can  
>>be  
>>>> pushed,  
>>>>>>>but you have to watch it.  
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>>>>>>>Nuendo/SX: Has a very Clear, 2 dimension sound, that does not hype  
>>>the  
>>>>>>>top  
>>>>>>>nor bottom end.  
>>>>>>>  
>>>>>>>Logic Audio: Very Broad- Aggressive sound, that really works for  
>>Rock  
>>>>>>>and  
>>>>>>>R & B/Gospel mixes.  
>>>>>>>  
>>>>>>>Digital Performer: With their hardware, superb audio quality. Full  
>>>  
>>>>>>>bodied  
>>>>>>>sound .  
>>>>>>>  
>>>>>>>Sonar: Very flat sounding. I would say that Sonar is your most  
vanilla  
>>>>>>>sound  
>>>>>>>DW on the market..  
>>>>>>>  
>>>>>>>Samplitude : A little less top end than Pro Tools. Full bodied  
3d  
>>>  
>>>>>>>sound..  
>>>>>>>  
>>>>>>>Paris: Dark sounding in comparison to the the other DAWs. But,  
has  
>>>a  
>>>>>3d  
>>>>>>>sound  
>>>>>>>quality that's full bodied.  
>>>>>>>  
>>>>>>>I feel that you asking SX to be something it's not with some analog  
>>>> summing.  
>>>>>>>Especially for your genre of music..  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>"Neil" <IUOIU@OIU.com> wrote:  
>>>>>>>  
>>>>>>>"Lamont" <jjdpro@ameritech.net> wrote:

>>>>>>>>>>  
>>>>>>>>>>>"I'd disagree with you in this instance because I happen to think  
>>>>> the  
>>>>>>>Cubase  
>>>>>>>>>ones DO sound better."  
>>>>>>>>>>  
>>>>>>>>>>>Then that SSL Engineer does not know what they are doing with  
>board.  
>>>>>>>There's  
>>>>>>>>>>>no way a mix coming off of that board SSL should sound better  
>than  
>>>>>>a  
>>>>>>>ITB  
>>>>>>>>>>>Cubase SX mix..  
>>>>>>>>>>  
>>>>>>>>>>>Sorry, that just does not jive. That engineer does not know how  
>>>to  
>>>>>>push  
>>>>>>>>>>he  
>>>>>>>>>>>SSL or just not familiar with it.  
>>>>>>>>>>  
>>>>>>>>>>>You're not really paying attention, are you? It was the same  
>>>>>>>>>>>engineer (me). And as far as whether or not I know how to use  
>>>>>>>>>>>that particular board, I guess that would be a matter of  
>>>>>>>>>>>your opinion. I don't think the SSL mixes are bad ones, I think  
>>>>>>>>>>>they came out good; I just think that you can hear more detail  
>>>>>>>>>>>in the ITB mixes in the examples I gave, and they have more  
>>>>>>>>>>>wideband frequency content from top to bottom.  
>>>>>>>>>>  
>>>>>>>>>>>Anyway, my point of that particular comparison wasn't to say  
>>>>>>>>>>>"ITB mixes are better than using a large-format console that  
>>>>>>>>>>>costs somewhere in the six-figure range", the point of it was  
>to  
>>>>>>>>>>>address a signal-chain suggestion that Paul had... he had  
>>>>>>>>>>>suggested perhaps that I needed to pick up a few pieces of  
>>>>>>>>>>>killer vintage gear, and I was just demonstrating that I think  
>>>>>>>>>>>the various signal chain components that I have here are on par  
>>>>>>>>>>>with most anything that can be found in heavy-hitter studios...  
>>>>>>>>>>>we used probably around \$100k's worth of mics & pre's on the  
>>>>>>>>>>>PTHD/SSL mixes, plus obviously you're looking at another  
>>>>>>>>>>>roughly \$100k for that particular console (40-channel E-series,  
>>>>>>>>>>>black EQ's, w/G-series Computer & Total Recall package), add in  
>>>>>>>>>>>the PTHD, outboard gear & whatnot, and you end up with  
>>>>>>>>>>>somewhere around a quarter-mil's worth of equipment involved in  
>>>>>>>>>>>that project. The project done at my place was done with my  
>>>>>>>>>>>gear, which certainly doesn't tally up to anywhere remotely  
>>>>>>>>>>>close to that cost & none of it bears a "vintage" stamp, but it  
>>>>>>>>>>>sounds competitive with the project that used all the heavy-

>>>>>>>>>hitter stuff.

>>>>>>>>>

>>>>>>>>>Neil

>>>>>>>>>

>>>>>>>>>

>>>>>>>>>

>>>>>>>>>

>>>>>>>>>

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>>>>>>>>>

>>>>>>>>>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Jamie K](#) on Thu, 21 Dec 2006 01:30:48 GMT

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---

To settle this, we're gonna have to get you two in the same room with multiple DAWs in a double blind test and see if you can hear a difference between the same exact stereo file playing back through the same monitoring chain from different DAWs.

Cheers,

-Jamie

[www.JamieKrutz.com](http://www.JamieKrutz.com)

LaMont wrote:

> See Dedic, everthing is this life is not expalnable. Although we would like  
> it to be  $2+2=4$ , the rality is that sometimes  $2+2=4.40$ ..Why, becuae the  
> the math is flawed. Why is the math flawed? Becuase we as humans are flawed.  
> Say what you will about the metric system, which is a great tool.But, sometimes  
> working in inches and 16ths, 3/4s works better.

>

> When a guy like Roger Nichols bangs his preverbial head around this issue  
> as to why his mix sound different being rendered from different and sometimes  
> the same cd mastering devices is expalnable, however the explanation does  
> not jive with the science.

> Are we to believe that the Science we have today about digital audio is  
> the the Last word?? No.. In the future, some new science will come along  
> and either rebuff our current science or enhance it.

>

> We I and other say.. We drop a stereo wav file in a given daw)(unity gain)  
> using the same audio converter...We can hear the diference. And it's sonically  
> obvious..

>  
> Lynns test is flawed because of the Roger Nicohls CD mastering problem. Things  
> change when going to render to CD.  
>  
> Hey some peole on this earth can hear and see better than others..That's  
> just a fact  
>  
> "Dedric Terry" <dedric@echomg.com> wrote:  
>> Of course Paris sounds different on Lynn's sampler, that was audible, and  
>  
>> there are technical reasons why Paris will always sound different, but I  
>  
>> didn't like it better on the sampler CD, to be honest, though the  
>> differences were subtle. Also, we weren't talking about Acid vs. Sonar  
>  
>> specifically. I don't even bother with Acid as a DAW example - it's a loop  
>  
>> app. Vegas is a video app that has had life as an audio app to some degree,  
>  
>> but iMovie does audio as well, yet that doesn't really put it in the same  
>  
>> category as professional DAW apps like Nuendo, PTHD, Sequoia, etc. I use  
>  
>> Vegas for video, but not audio.  
>>  
>> On Lynn's sampler, Samplitude, Nuendo, Fairlight and the other natives don't  
>  
>> sound different and aren't different in the unity gain examples  
>> (even the PTHD mix cancels with these). If you hear two files sounding  
>  
>> differently that cancel to complete null, an audio difference isn't what  
> you  
>> are hearing. When there are differences in non-unity gain mix summing  
>> tests, you have an extra variable to account for - how is the gain  
>> calculated? Gain  
>> is non-linear (power), not adding two numbers together. So how is pan law  
>  
>> factored in, and where? Are your faders exactly the same, or 0.001dB  
>> variant?  
>>  
>> Also if you drop the same stereo file in two different pro audio apps and  
>  
>> hear a difference, one of the two apps is defective. There is nothing  
>> happening with a stereo file playback when no gain change or plugins are  
>  
>> active - just audio streaming to the driver from disk. If you hear a  
>> difference there, I would be quickly trying to find out why. Something  
> is

>> wrong.  
>>  
>> The point I am making is that these arguments usually come up as blanket  
>  
>> statements with no qualification of what exactly sounds  
>> different, why it might, or solid well reasoned attempts to find out why,  
> or  
>> if there could be a real difference, or just a perceived one.  
>>  
>> Usually the "use your ears" comment comes up when there is no technical  
>  
>> rebuttal for when the science and good  
>> ears agree. Of course "use your ears" first from a creative perspective,  
>  
>> but if you are making a technical, scientific statement, then such comments  
>> aren't a good foundation to work from. It's a great motto, but a bit of  
> a  
>> cop out in a technical discussion.  
>>  
>> Regards,  
>> Dedic  
>>  
>> "LaMont" <jjdpro@ameriech.net> wrote in message news:45897f73\$1@linux...  
>>> Hey Dedic and Neil,  
>>>  
>>> I reason I think that the Summing CD test(good intentions) were lame was  
>>> because.. If a person can;t hear the difference btw a stereo wav file  
>  
>>> that's  
>>> in Acid vs Sonar really needs a hearing test.  
>>>  
>>> For reason of my music work, I have to work with different DAWs, so I'm  
>  
>>> very  
>>> familiar with their sound qualities. My circle of producers and engineers  
>>> talk about the daw sonics all the time. It's really no big deal anymore..  
>>>  
>>> The same logic applies when Roger Nichols (a few) years back in his  
>>> article  
>>> about master CD's and that he found out that 4 differnt CD burners yeilded  
>>> differnt sonic results. Sure, he sated that Math is the Math :) but, his  
>>> and the masering engineers Ears told them soemthing was different.  
>>> Hummm???  
>>>  
>>> Now, back to DAW sonics. I can hear the difference btw Paris and Nuendo  
> vs  
>>> Pro Tools, Logic audio.. There is no math to this, this is an ear  
>>> thing..You

>>> either hear or you don't.. Simple.  
>>> But, good ears can hear it. .  
>>>  
>>> I really think the problem is, noone want to no that their money that  
>  
>>> they've  
>>> spent on a given DAW, has sonic limitations or shall we say, just  
>>> different..  
>>>  
>>> I like that they all sound different. It's good to have choice when mixing  
>>> a song. Some DAWs, depending on the genre will yield better or the desired  
>>> results and than another.  
>>> EX. I would not mix a Acoustic jazz record today with Paris..reason, I'm  
>>> going for clarity at it's highest level.. For that project, It's either  
>  
>>> Nuendo  
>>> or Pro Tools and may Samplitude..Why should I fight with Paris's thick,  
>  
>>> gooy  
>>> sonics, when I'm going for clarity. Well, Pro Tools and Nuendo/SX has  
> that  
>>> sound right out the gate.. Which makes my job a lot easier. simple. This  
>>> is not tosay that I could not get the job done in Paris..i could..But,  
> for  
>>> that Acoutic Jazz project , the other 2 daws gives me what I'm looking  
>  
>>> for  
>>> without even touching an eq..  
>>>  
>>> This is not all about math. As BrianT states: Use you ears..Forget the  
>  
>>> math..What  
>>> does knowing the math do for you anyway? Nothing, it just proves that  
> you  
>>> know the math. Does not tell you diddly about the sonics.. Just ask Roger  
>>> Nichols..  
>>>  
>>>  
>>> "Dedric Terry" <d@nospam.net> wrote:  
>>>> I know we disagree here Lamont and that's totally cool, so I won't take  
>>> this  
>>>> beyond this one response, and this isn't really directed to you, but my  
>>> general  
>>>> thoughts on the matter.  
>>>>  
>>>> In Neil's "defense" (not that he needs it), I and others have done this  
>>> comparison  
>>>> to death and the conclusion I've come to is that people are 80% influenced

>>>> by a change in environment (e.g. software interface) and 20% ears. Sorry  
>>>> to say it, but the difference in sound between floating point DAWs is  
> far  
>>> >from real. It's just good, albeit unintentional marketing created by  
>  
>>>> users  
>>>> and capitalized by manufacturers. Perceiving a "sound" in DAWs that in  
>>> actuality  
>>>> process data identically, is a bad reason to pick a DAW, but of course  
>  
>>>> there  
>>>> is nothing wrong with thinking you hear a difference as long as it doesn't  
>>>> become an unwritten law of engineering at large. Preferring to work with  
>>>> one or the other, and "feeling" better about it for whatever reason is  
> a  
>>>> great reason to pick one DAW over another.  
>>>>  
>>>> There was a recent thread that Nuendo handled gain through groups  
>>>> differently,  
>>>> so I put Nuendo, Sonar 6 (both 32 and 64-bit engines) and Sequoia 8.3  
> to  
>>>> the test - identical tests, setup to the 1/100th of a dB identically and  
>>>> came up with absolutely no difference, either audible or scientific.  
> To  
>>>> be honest, this was the one test where I could have said, yes there is  
> an  
>>>> understandable difference between DAWs in a simple math function, and  
> the  
>>>> only one in the DAW that actually might make sense, yet even that did  
> not  
>>>> exist. The reason - math is math. You can paint it red, blue, silver  
> or  
>>>> dull grey, but it's still the same math unless the programmer was high  
> or  
>>>> completely incompetent when they wrote the code.  
>>>>  
>>>> I thought it was entirely possible the original poster had found something  
>>>> different in Nuendo, but when it came down to really understanding and  
>  
>>>> reproducing  
>>>> what happens in DAW summing and gain structures accurately between each  
>>> DAW,  
>>>> there was none, nada, nil. The assertion was completely squashed. This  
>  
>>>> also  
>>>> showed me how easy it is for a wide range of professionals to misinterpret  
>>>> digital audio - whether hearing things, or just setting up a test with  
> a

>>>> single missed variable that completely invalidates the whole process.  
>>>>  
>>>> If you hear a difference, great. I've thought I heard a difference doing  
>>>> similar comparisons, then changed my perspective (nothing else - not  
>>>> converters,  
>>>> nothing - just reset my expectations, and switched back and forth) and  
>  
>>>> could  
>>>> hear no difference.  
>>>>  
>>>> Just leave some room for other opinions when you post yours on this  
>>>> subject  
>>>> since it is very obvious that hearing is not as universally objective  
> and  
>>>> identically referenced as everyone might like to believe, and is highly  
>>> visually  
>>>> and environmentally affected. Some will hear differences in DAWs. There  
>>>> are Cubase SX 3 users claiming Cubase 4 sounds different. Sigh. Then  
>  
>>>> they  
>>>> realize they aren't even using the same project... or at least different  
>>>> EQs, or etc, etc....  
>>>>  
>>>> Say what you want about published summing tests, but Lynn's tests are  
> as  
>>>> accurate as it gets, and that bears out in the results (all floating point  
>>>> DAWs cancel and sound identical - if you are hearing a difference, you  
> are  
>>>> hearing things that aren't there, or you forgot to align their gain and  
>>> placement).  
>>>> I've worked with Lynn at least briefly enough to know his attention to  
>>> detail.  
>>>> In the same way people will disagree about PCs and Macs until neither  
>  
>>>> exists,  
>>>> so will audio engineers disagree about DAWs. This is one debate that  
> will  
>>>> always exist as long as we have different ears, eyes, brains,... and  
>>>> opinions.  
>>>>  
>>>>  
>>>> What Neil has done is to prove that opinions are always going to differ  
>>> (i.e.  
>>>> no consensus on the "best" mix of the ones posted). And in truth everyone  
>>>> has a different perception of sound in general - not everyone wants to  
>  
>>>> hear  
>>>> things the same way, so we judge "best" from very different perspectives.



>>>> There is no single gold standard. There are variations and mutated  
>>>> combinations,  
>>>> but all are subjective. That in and of itself implies very distinctly  
>  
>>>> that  
>>>> people can and will even perceive the exact same sound differently if  
>  
>>>> presented  
>>>> with any variable that changes the brain's interpretation, even if just  
>>> a  
>>>> visual distraction. Just change the lights in the room and see if you  
>  
>>>> perceive  
>>>> a song differently played back exactly the same way. Or have a cat run  
>>> across  
>>>> a desk while listening. Whether you care to admit it or not, it is there,  
>>>> and that is actually the beauty of how our sense interact to create  
>>>> perception.  
>>>> That may be our undoing with DAW comparison tests, but it's also what  
>  
>>>> keeps  
>>>> music fresh and creative, when we allow it to.  
>>>>  
>>>> So my suggestion is to use what makes you most creative, even if it's  
> just  
>>>> a "feeling" working with that DAW gives you - be it the workflow, the  
> GUI,  
>>>> or even the name brand reputation. But, as we all know, if you can't  
> make  
>>>> most any material sound good on whatever DAW you choose, the DAW isn't  
> the  
>>>> problem.  
>>>>  
>>>> Regards,  
>>>> Dedic  
>>>>  
>>>> "Neil" <IUOIU@OIU.com> wrote:  
>>>>> That's interesting - all those DAW sonic interpretations, I  
>>>>> mean... I haven't had a chance to use all of those, so it's  
>>>>> good information.  
>>>>>  
>>>>> I still don't understand why you consider my summing  
>>>>> comparisons "lame", however - it was a fair set of tests;  
>>>>> the same mix summed in different ways. Not trying to prove a  
>>>>> point or to rig it so one sounded any better than the other - in  
>>>>> fact, if you recall the thread, different people liked different  
>>>>> summed versions for different reasons... there wasn't any one  
>>>>> version that stood out as being "the one" that everyone felt

>>>>> sounded better. The only reason I didn't come right out & say  
>>>>> right away which version was which is so that I didn't bias  
>>>>> anyone's opinion beforehand by mentioning that... NOT to try  
>>>>> & "hide" anything or "trick" anyone, as you accused me of  
>>>>>  
>>>>> Sheesh!  
>>>>>  
>>>>> Neil  
>>>>>  
>>>>>  
>>>>> "Lamont" <jjdpro@ameritech.net> wrote:  
>>>>>> Hey Neil,  
>>>>>>  
>>>>>>> All I'm saying is: All DAW software have their own unique sound.  
>>>>>>> Despite  
>>>>>>> what those lame summing test shows..  
>>>>>>>  
>>>>>>> PT-HD has a very distinct sound. A very polished sound, with a nice  
> top  
>>>>>>> end,  
>>>>>>> but with full audio spectrum represented. Mixer/Summing buss can be  
>  
>>>>>>> pushed,  
>>>>>>> but you have to watch it.  
>>>>>>>  
>>>>>>> Nuendo/SX: Has a very Clear, 2 dimension sound, that does not hype the  
>>>> top  
>>>>>>> nor bottom end.  
>>>>>>>  
>>>>>>> Logic Audio: Very Broad- Aggressive sound, that really works for Rock  
>>>> and  
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>>>>>>> bodied  
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>>>>>>> Sonar: Very flat sounding. I would say that Sonar is your most vanilla  
>>>>> sound  
>>>>>>> DW on the market..  
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>>>>>>> Samplitude : A little less top end than Pro Tools. Full bodied 3d  
>>>>>>> sound..  
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>>>>>>> Paris: Dark sounding in comparison to the the other DAWs. But, has a  
> 3d  
>>>>>>> sound  
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>>>>>  
>>>>> I feel that you asking SX to be something it's not with some analog  
>  
>>>>> summing.  
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>>>>>  
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>>>>>>> You're not really paying attention, are you? It was the same  
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>>>>>>> your opinion. I don't think the SSL mixes are bad ones, I think  
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>>>>>>> "ITB mixes are better than using a large-format console that  
>>>>>>> costs somewhere in the six-figure range", the point of it was to  
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>>>>>>> killer vintage gear, and I was just demonstrating that I think  
>>>>>>> the various signal chain components that I have here are on par  
>>>>>>> with most anything that can be found in heavy-hitter studios...  
>>>>>>> we used probably around \$100k's worth of mics & pre's on the  
>>>>>>> PTHD/SSL mixes, plus obviously you're looking at another  
>>>>>>> roughly \$100k for that particular console (40-channel E-series,  
>>>>>>> black EQ's, w/G-series Computer & Total Recall package), add in

>>>>>> the PTHD, outboard gear & whatnot, and you end up with  
>>>>>> somewhere around a quarter-mill's worth of equipment involved in  
>>>>>> that project. The project done at my place was done with my  
>>>>>> gear, which certainly doesn't tally up to anywhere remotely  
>>>>>> close to that cost & none of it bears a "vintage" stamp, but it  
>>>>>> sounds competitive with the project that used all the heavy-  
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>>>>>>  
>>>>>> Neil  
>>  
>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Dedric Terry](#) on Thu, 21 Dec 2006 02:17:50 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

"LaMont" <jjdpro@ameritech.net> wrote in message news:4589d1aa\$1@linux...  
>  
> See Dedric, everthing is this life is not expalinable. Although we would  
> like  
> it to be  $2+2=4$ , the rality is that sometimes  $2+2=4.40$ ..Why, becuae the  
> the math is flawed. Why is the math flawed? Becuase we as humans are  
> flawed.

You can wax philosophical all you want, but I think you would find a strong argument with a lot of very knowledgeable engineers, programmers and mathematicians on that - my college professors in math, engineering and digital signal processing being among those. Saying that not everything is explainable is saying that software is partly unpredictable and has a mind and behavior of its' own. It doesn't in this case (no neural nets, or ai going on here). Sure, you can program audio processing differently when that is the goal, but you can easily determine when that happens, and when it doesn't.

I don't agree that just because a guy is well know that he has the last word on the issue.  
I also don't agree with your supposed assessment that we disagree because "some people hear better than others". You have no way of knowing what and how well I hear, or how well, or how baised and subjectively other engineers you quote might hear. When I have more time we'll put this to the test. I'll post something to listen to and

we'll find find out  
what is heard and what isn't.

Also, come on, 2+2 is never 4.40. That's not even in the ballpark of being a logical and reasonable analogy. We might as well claim that blue sounds better than green, or the sun only circles the earth when the man in the moon is making cheddar cheese.

You also threw in Roger Nichols' CD mastering test as a reason to discount Lynn's summing test, but that has nothing to do with pulling files off of the \*same\* CD, hearing, and watching them cancel to null, so that is a poor argument as well.

Lamont, I've read some very well respected engineers, RN being one of them, claim some absolute crap in this realm, and back it up with highly suspect comparisons. I'm also not the only one who has noticed this, but out of respect we hold our tongues and shake our heads, quietly trying to keep the rest of the audio community from succumbing to audio myths rather than practicing intelligent engineering. I don't know everything - far from it - but I do know what I hear, and how to connect it with what I see and what I do know.

Why do I use scientific comparisons such as phase cancellation and isolating variables to make my comparisons? To rule out perception, visual distraction, and preconceived ideas built by reading newsgroups, articles by "famous" engineers, and peer pressure. I don't disagree that DAWs can be designed to sound differently, but when they aren't, \*and\* we verify that they aren't, sorry, there is nothing left to be different other than the GUI, marketing and street hype.

Maybe someday I'll win a grammy or write a hit song for a ditzy pop starlet so my opinion will carry some weight. ;-)

In the mean time, just don't believe everything you read, and only half of what you hear.

Dedric

> Say what you will about the metric system, which is a great tool. But,

> sometimes  
> working in inches and 16ths, 3/4s works better.  
>  
> When a guy like Roger Nichols bangs his proverbial head around this issue  
> as to why his mix sound different being rendered from different and  
> sometimes  
> the same cd mastering devices is explainable, however the explanation does  
> not jive with the science.  
> Are we to believe that the Science we have today about digital audio is  
> the the Last word?? No.. In the future, some new science will come along  
> and either rebuff our current science or enhance it.  
>  
> We I and other say.. We drop a stereo wav file in a given daw)(unity gain)  
> using the same audio converter...We can hear the diference. And it's  
> sonically  
> obvious..  
>  
> Lynns test is flawed because of the Roger Nichohls CD mastering problem.  
> Things  
> change when going to render to CD.  
>  
> Hey some peole on this earth can hear and see better than others..That's  
> just a fact  
>  
> "Dedric Terry" <dedric@echomg.com> wrote:  
>>Of course Paris sounds different on Lynn's sampler, that was audible, and  
>  
>>there are technical reasons why Paris will always sound different, but I  
>  
>>didn't like it better on the sampler CD, to be honest, though the  
>>differences were subtle. Also, we weren't talking about Acid vs. Sonar  
>  
>>specifically. I don't even bother with Acid as a DAW example - it's a  
>>loop  
>  
>>app. Vegas is a video app that has had life as an audio app to some  
>>degree,  
>  
>>but iMovie does audio as well, yet that doesn't really put it in the same  
>  
>>category as professional DAW apps like Nuendo, PTHD, Sequoia, etc. I use  
>  
>>Vegas for video, but not audio.  
>>  
>>On Lynn's sampler, Samplitude, Nuendo, Fairlight and the other natives  
>>don't  
>  
>>sound different and aren't different in the unity gain examples

>>(even the PTHD mix cancels with these). If you hear two files sounding  
>  
>>differently that cancel to complete null, an audio difference isn't what  
> you  
>>are hearing. When there are differences in non-unity gain mix summing  
>>tests, you have an extra variable to account for - how is the gain  
>>calculated? Gain  
>>is non-linear (power), not adding two numbers together. So how is pan law  
>  
>>factored in, and where? Are your faders exactly the same, or 0.001dB  
>>variant?  
>>  
>>Also if you drop the same stereo file in two different pro audio apps and  
>  
>>hear a difference, one of the two apps is defective. There is nothing  
>>happening with a stereo file playback when no gain change or plugins are  
>  
>>active - just audio streaming to the driver from disk. If you hear a  
>>difference there, I would be quickly trying to find out why. Something  
> is  
>>wrong.  
>>  
>>The point I am making is that these arguments usually come up as blanket  
>  
>>statements with no qualification of what exactly sounds  
>>different, why it might, or solid well reasoned attempts to find out why,  
> or  
>>if there could be a real difference, or just a perceived one.  
>>  
>>Usually the "use your ears" comment comes up when there is no technical  
>  
>>rebuttal for when the science and good  
>>ears agree. Of course "use your ears" first from a creative perspective,  
>  
>>but if you are making a technical, scientific statement, then such  
>>comments  
>>aren't a good foundation to work from. It's a great motto, but a bit of  
> a  
>>cop out in a technical discussion.  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMont" <jjdpro@ameriech.net> wrote in message news:45897f73\$1@linux...  
>>>  
>>> Hey Dedric and Neil,  
>>>  
>>> I reason I think that the Summing CD test(good intentions) were lame was

>>> because.. If a person can;t hear the difference btw a stereo wav file  
>  
>>> that's  
>>> in Acid vs Sonar really needs a hearing test.  
>>>  
>>> For reason of my music work, I have to work with different DAWs, so I'm  
>  
>>> very  
>>> familiar with their sound qualities. My circle of producers and  
>>> engineers  
>>> talk about the daw sonics all the time. It's really no big deal  
>>> anymore..  
>>>  
>>> The same logic applies when Roger Nichols (a few) years back in his  
>>> article  
>>> about master CD's and that he found out that 4 differnt CD burners  
>>> yeilded  
>>> differnt sonic results. Sure, he sated that Math is the Math :) but, his  
>>> and the masering engineers Ears told them soemthing was different.  
>>> Hummm???  
>>>  
>>> Now, back to DAW sonics. I can hear the difference btw Paris and Nuendo  
> vs  
>>> Pro Tools, Logic audio.. There is no math to this, this is an ear  
>>> thing..You  
>>> either hear or you don't.. Simple.  
>>> But, good ears can hear it. .  
>>>  
>>> I really think the problem is, noone want to no that their money that  
>  
>>> they've  
>>> spent on a given DAW, has sonic limitations or shall we say, just  
>>> different..  
>>>  
>>> I like that they all sound different. It's good to have choice when  
>>> mixing  
>>> a song. Some DAWs, depending on the genre will yield better or the  
>>> desired  
>>> results and than another.  
>>> EX. I would not mix a Acoustic jazz record today with Paris..reason, I'm  
>>> going for clarity at it's highest level.. For that project, It's either  
>  
>>> Neundo  
>>> or Pro Tools and may Samplitude..Why should I fight with Paris's thick,  
>  
>>> gooy  
>>> sonics, when I'm going for clarity. Well, Pro Tools and Nuendo/SX has  
> that



>>> sound right out the gate.. Which makes my job a lot easier. simple. This  
>>> is not to say that I could not get the job done in Paris..i could..But,  
> for  
>>> that Acoustic Jazz project , the other 2 daws gives me what I'm looking  
>  
>>> for  
>>> without even touching an eq..  
>>>  
>>> This is not all about math. As BrianT states: Use your ears..Forget the  
>  
>>> math..What  
>>> does knowing the math do for you anyway? Nothing, it just proves that  
> you  
>>> know the math. Does not tell you diddly about the sonics.. Just ask  
>>> Roger  
>>> Nichols..  
>>>  
>>>  
>>> "Dedric Terry" <d@nospam.net> wrote:  
>>>>  
>>>>I know we disagree here Lamont and that's totally cool, so I won't take  
>>> this  
>>>>beyond this one response, and this isn't really directed to you, but my  
>>> general  
>>>>thoughts on the matter.  
>>>>  
>>>>In Neil's "defense" (not that he needs it), I and others have done this  
>>> comparison  
>>>>to death and the conclusion I've come to is that people are 80%  
>>>>influenced  
>>>>by a change in environment (e.g. software interface) and 20% ears.  
>>>>Sorry  
>>>>to say it, but the difference in sound between floating point DAWs is  
> far  
>>>>from real. It's just good, albeit unintentional marketing created by  
>  
>>>>users  
>>>>and capitalized by manufacturers. Perceiving a "sound" in DAWs that in  
>>> actuality  
>>>>process data identically, is a bad reason to pick a DAW, but of course  
>  
>>>>there  
>>>>is nothing wrong with thinking you hear a difference as long as it  
>>>>doesn't  
>>>>become an unwritten law of engineering at large. Preferring to work  
>>>>with  
>>>>one or the other, and "feeling" better about it for whatever reason is  
> a

>>>>great reason to pick one DAW over another.  
>>>>  
>>>>There was a recent thread that Nuendo handled gain through groups  
>>>>differently,  
>>>>so I put Nuendo, Sonar 6 (both 32 and 64-bit engines) and Sequoia 8.3  
> to  
>>>>the test - identical tests, setup to the 1/100th of a dB identically and  
>>>>came up with absolutely no difference, either audible or scientific.  
> To  
>>>>be honest, this was the one test where I could have said, yes there is  
> an  
>>>>understandable difference between DAWs in a simple math function, and  
> the  
>>>>only one in the DAW that actually might make sense, yet even that did  
> not  
>>>>exist. The reason - math is math. You can paint it red, blue, silver  
> or  
>>>>dull grey, but it's still the same math unless the programmer was high  
> or  
>>>>completely incompetent when they wrote the code.  
>>>>  
>>>>I thought it was entirely possible the original poster had found  
>>>>something  
>>>>different in Nuendo, but when it came down to really understanding and  
>  
>>>>reproducing  
>>>>what happens in DAW summing and gain structures accurately between each  
>>> DAW,  
>>>>there was none, nada, nil. The assertion was completely squashed. This  
>  
>>>>also  
>>>>showed me how easy it is for a wide range of professionals to  
>>>>misinterpret  
>>>>digital audio - whether hearing things, or just setting up a test with  
> a  
>>>>single missed variable that completely invalidates the whole process.  
>>>>  
>>>>If you hear a difference, great. I've thought I heard a difference  
>>>>doing  
>>>>similar comparisons, then changed my perspective (nothing else - not  
>>>>converters,  
>>>>nothing - just reset my expectations, and switched back and forth) and  
>  
>>>>could  
>>>>hear no difference.  
>>>>  
>>>>Just leave some room for other opinions when you post yours on this  
>>>>subject

>>>>since it is very obvious that hearing is not as universally objective  
> and  
>>>>identically referenced as everyone might like to believe, and is highly  
>>> visually  
>>>>and environmentally affected. Some will hear differences in DAWs.  
>>>>There  
>>>>are Cubase SX 3 users claiming Cubase 4 sounds different. Sigh. Then  
>  
>>>>they  
>>>>realize they aren't even using the same project... or at least different  
>>>>EQs, or etc, etc....  
>>>>  
>>>>Say what you want about published summing tests, but Lynn's tests are  
> as  
>>>>accurate as it gets, and that bears out in the results (all floating  
>>>>point  
>>>>DAWs cancel and sound identical - if you are hearing a difference, you  
> are  
>>>>hearing things that aren't there, or you forgot to align their gain and  
>>> placement).  
>>>> I've worked with Lynn at least briefly enough to know his attention to  
>>> detail.  
>>>> In the same way people will disagree about PCs and Macs until neither  
>  
>>>> exists,  
>>>>so will audio engineers disagree about DAWs. This is one debate that  
> will  
>>>>always exist as long as we have different ears, eyes, brains,... and  
>>>>opinions.  
>>>>  
>>>>  
>>>>What Neil has done is to prove that opinions are always going to differ  
>>> (i.e.  
>>>>no consensus on the "best" mix of the ones posted). And in truth  
>>>>everyone  
>>>>has a different perception of sound in general - not everyone wants to  
>  
>>>>hear  
>>>>things the same way, so we judge "best" from very different  
>>>>perspectives.  
>>>> There is no single gold standard. There are variations and mutated  
>>>> combinations,  
>>>>but all are subjective. That in and of itself implies very distinctly  
>  
>>>>that  
>>>>people can and will even perceive the exact same sound differently if  
>  
>>>>presented

>>>>with any variable that changes the brain's interpretation, even if just  
>>> a  
>>>>visual distraction. Just change the lights in the room and see if you  
>  
>>>>perceive  
>>>>a song differently played back exactly the same way. Or have a cat run  
>>> across  
>>>>a desk while listening. Whether you care to admit it or not, it is  
>>>>there,  
>>>>and that is actually the beauty of how our sense interact to create  
>>>>perception.  
>>>> That may be our undoing with DAW comparison tests, but it's also what  
>  
>>>> keeps  
>>>>music fresh and creative, when we allow it to.  
>>>>  
>>>>So my suggestion is to use what makes you most creative, even if it's  
> just  
>>>>a "feeling" working with that DAW gives you - be it the workflow, the  
> GUI,  
>>>>or even the name brand reputation. But, as we all know, if you can't  
> make  
>>>>most any material sound good on whatever DAW you choose, the DAW isn't  
> the  
>>>>problem.  
>>>>  
>>>>Regards,  
>>>>Dedric  
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>>>>"Neil" <IUOIU@OIU.com> wrote:  
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>>>>>>sounds competitive with the project that used all the heavy-  
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>>>>>>

>>>>>>Neil

>>>>>>

>>>>>

>>>>

>>>

>>

>>

>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Nil](#) on Thu, 21 Dec 2006 02:23:18 GMT

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---

"LaMont" <jjdpro@ameritech.net> wrote:

>

>Lynns test is flawed because of the Roger Nicohls CD mastering  
>problem. Things change when going to render to CD.

I don't know that that makes those tests flawed - you're talking about another step being inserted into the process. The additional step of mastering presents a whole different set of issues unto itself.... doesn't necessarily mean that tests done on steps involved prior to mastering are automatically invalid.

>Hey some people on this earth can hear and see better than  
>others..That's just a fact

Let's separate the esoteric from the mundane here... I, for one, am not necessarily interested in only those who can hear better, I'm interested in those with average hearing and "untrained" ears, too. Do I have "good ears"? Yeah, I guess. "Golden Ears"? Probably not. Yet, in the comparison files I did, I think its all safe to say we were ALL reduced to an equal footing with those of average hearing & "untrained ears", simply because they were rendered to an mp3 format, that's incapable of reproducing the frequency range & fidelity of the original files... yet EVERYONE heard a difference between one clip & another. Again, some liked one version or another for different reasons, but my point is: there was indeed a perceivable difference between them, even though we

were all reduced to a lesser set of capabilities, hearing-wise, than if we all had the original wav files to listen to.

THIS is what I'm talking about - not something that only makes a difference to the "Golden Ears" types, but something that enhances the listening pleasure to everyone, even the average Joe who may listen to it. I don't know that subtle differences between one Native DAW & another - whether they really exist or not - are going to make this kind of level of change in what each contributes to a given mix. I've said before that when it comes to tracking, it's all about the convertors, when it comes to mixing, it's all about the summing... maybe that's too broad of an empirical statement to be 100% accurate, but I think there's a lot of truth to it.

I also don't know that whether two files "null" to 100% or not is the only test of if "a" must therefore sound just like "b"... let's face it, if something nulls, all it means is that every peak is equal in amplitude... but what's going on BELOW the peaks? What does it sound like at 200hz @ 5db down from the peak at that frequency, for example? What is something DOING to the sound at perhaps a lower (but still audible) level, as opposed to at what amplitude is it outputting the sound is something that a null test can't always address, IMO.

So I guess I've made some points supporting both sides of the argument... fight on! lol

Neil

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Dedric Terry](#) on Thu, 21 Dec 2006 02:33:46 GMT  
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"Neil" <IUOIU@OIU.com> wrote in message news:4589e206\$1@linux...

> I also don't know that whether two files "null" to 100% or not  
> is the only test of if "a" must therefore sound just  
> like "b"... let's face it, if something nulls, all it means is  
> that every peak is equal in amplitude... but what's going on  
> BELOW the peaks? What does it sound like at 200hz @ 5db down  
> from the peak at that frequency, for example? What is something

Neil, the digital signal is represented by more than peak amplitude in order to represent modulation, period and phase of the waveform, so phase cancellation



has to compare more than peaks. Pull up a 44.1k, 24-bit file in Cool Edit or Audition and zoom - you'll see sample points all along the wave for anything below 20kHz.

All of those sample points have to cancel for a phase invert test to cancel completely.

The point at which we lose any resolution is the last bit, and only when that bit is change.

When comparing two copies of the same file, or identical files, neither with any gain change,

with one inverted, we aren't changing any bits, unless the audio app is severely flawed, so

even quantization noise is out. Even in tests in Nuendo changing the gain of a file and making

up that gain later, and comparing it to a phase inverted copy of that file shows that only

quantization noise below -144dB remains, and only a few peaks

reach -136dB (which is the point at which we see deviation in the last bit due to truncation

in the gain change process).

Dedric

> DOING to the sound at perhaps a lower (but still audible)  
> level, as opposed to at what amplitude is it outputting the  
> sound is something that a null test can't always address, IMO.

>

> So I guess I've made some points supporting both sides of the  
> argument... fight on! lol

>

> Neil

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [Dedric Terry](#) on Thu, 21 Dec 2006 03:45:16 GMT

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>

> How far does it go in # of samples per second & difference in  
> db for each one before you can hear it? We don't really know,  
> do we? Who's done that test? No one. Ever.

Well, that's what the software is doing when adding a phase inverted file to it's original - inverting

each word (24 or 16 bit) at each sample point in the audio file, and comparing them to the same

sample position in the non-inverted file (e.g. one by one, 44,100 of them

every second).

So, yes, we've all done exactly that, everytime we do a phase invert test and bounce the output to 32-bit floating point, or watch it on a realtime analyzer set to read below -144dB, which is the end of where 24-bit can represent. A null is nothing showing up even below that level. If you zoom in on the analyzer you will see single sample peaks on a phase cancellation test difference file, so even if one shows up, you can see it. The tests I did were completely blank down to -200 dB (far below the last bit). It's safe to say there is no difference, even in quantization noise, which by technical rights, is considered below the level of "cancellation" in such tests.

As far as the question of how much, or rather how little change can we hear - that is certainly been debated. But that's where the scientific side comes into play (when our ears mislead us too easily). If you cancel it in software, you probably aren't hearing a difference in reality. If software math is that unreliable, then you would never be able to recall a mix and run down a "duplicate" - even without random variables such as reverb or delay, it wouldn't sound even close to the same.

Regards,  
Dedric

"Nei" <IUOIU@OIU.com> wrote in message news:4589f623\$1@linux...

> At 44,1000 sample points per second, I'll bet you can have  
> PLENNNTY of samples that "miss" or don't cancel completely &  
> still get a "null".  
>  
> What is the sound of one sample clapping?  
>  
> How about two?  
>  
> How about twenty seven samples, all roughly evenly-spaced  
> across the couse of a second... can you hear that if the  
> difference between those 27 samples is an average of couple of  
> db each?  
>  
> How far does it go in # of samples per second & difference in  
> db for each one before you can hear it? We don't really know,  
> do we? Who's done that test? No one. Ever.  
>  
>

> Neil

---

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by Nil on Thu, 21 Dec 2006 03:49:07 GMT

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"Dedric Terry" <dedric@echomg.com> wrote:

>

>"Neil" <IUOIU@OIU.com> wrote in message news:4589e206\$1@linux...

>

>> I also don't know that whether two files "null" to 100% or not

>> is the only test of if "a" must therefore sound just

>> like "b"... let's face it, if something nulls, all it means is

>> that every peak is equal in amplitude... but what's going on

>> BELOW the peaks? What does it sound like at 200hz @ 5db down

>> from the peak at that frequency, for example? What is something

>

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>20kHz.

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db each?

How far does it go in # of samples per second & difference in

db for each one before you can hear it? We don't really know, do we? Who's done that test? No one. Ever.

Neil

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Dedric Terry](#) on Thu, 21 Dec 2006 06:52:14 GMT  
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---

Lamont,

If you had read my post you would know that I do use my ears, and have used pretty much every DAW in this thread. You would also have read that I always recommend ears first, and have in several other threads. My ears are what I base my decisions on exclusively. You obviously don't understand the process of comparative testing or you would have understood (as I stated) that the "scopes and graphs" as you call them, come after the ears to confirm and/or put a clearer face on the "I think it sounds like this" perception. To be clear, since you seem to be missing this point, this "testing" is for the purpose of understanding what's behind the tools we use, and sorting out fact from myth - not for making mixing decisions.

You have offered nothing other than your opinion in broad, emotionally based comments throughout this thread with no specifics to back up your claim. You asserted a technical claim with "use your ears" and "software has a sound" instead of a firm grasp of what is actually being discussed. I and others have proven your blanket suppositions wrong in other situations several times, but it isn't worth rehashing here given the direction and lack of objectivity this discussion is taking. You hear what you hear and that's fine, but I don't appreciate your condescending tone here, so this will be my last post on this topic here. Good luck!

Dedric

"LaMont" <jjdpro@gmail.com> wrote in message news:458a22bc\$1@linux...  
>  
> I'm sorry Dedric, but your statements below are full of hot Scientific hot  
> air balonga..

>  
> You should always trust your ears, and not some stupid math. This is  
> music,  
> not a science project..Get the wax out and listen with your ears instead  
> of your scopes and graphs.. And, while your at it, how about acually  
> working  
> with differnt DAW software to actually hear the difference. Your  
> conclusions  
> that it's all "perception" is hogwash..  
>  
> And if you read RN's piece on CD mastering, you'd know he was stuck on  
> math  
> as well, seeing as he's an Electical Engineer(EE).Software as a sound.  
>  
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> As far as the question of how much, or rather how little change can we  
> hear  
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> been debated. But that's where the scientific side comes into play (when  
> our ears mislead us too easily).  
> If you cancel it in software, you probably aren't hearing a difference in  
>  
> reality. If software math is that unreliable, then you would never be able  
> to recall a mix and run down a "duplicate" - even without random variables  
> such as reverb or delay, it wouldn't sound even close to the same.  
>  
>  
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> "Dedric Terry" <dedric@echomg.com> wrote:  
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>>The tests I did were completely blank down to -200 dB (far below the last  
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>>Regards,  
>>Dedric  
>>  
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>>> across the course of a second... can you hear that if the  
>>> difference between those 27 samples is an average of couple of  
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>>>

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>>>  
>>> Neil  
>>  
>>  
>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [LaMontt](#) on Thu, 21 Dec 2006 06:59:24 GMT  
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---

I'm sorry Detric, but your statements below are full of hot Scientific hot air balonga..

You should always trust your ears, and not some stupid math. This is music, not a science project..Get the wax out and listen with your ears instead of your scopes and graphs.. And, while your at it, how about acually working with differnt DAW software to actually hear the difference. Your conclusions that it's all "perception" is hogwash..

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"Detric Terry" <[dedric@echomg.com](mailto:dedric@echomg.com)> wrote:

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>  
>Regards,  
>Dedric  
>  
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>  
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>> still get a "null".  
>>



>> What is the sound of one sample clapping?  
>>  
>> How about two?  
>>  
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>> db each?  
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>> do we? Who's done that test? No one. Ever.  
>>  
>>  
>> Neil  
>  
>

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Neil](#) on Thu, 21 Dec 2006 13:53:46 GMT  
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"Dedric Terry" <[dedric@echomg.com](mailto:dedric@echomg.com)> wrote:  
>The tests I did were completely blank down to -200 dB (far below the last  
  
>bit). It's safe to say there is no difference, even in  
>quantization noise, which by technical rights, is considered below the level  
  
>of "cancellation" in such tests.

I'm not necessarily talking about just the first bit or the last bit, but also everything in between... what happens on bit #12, for example? Everything on bit #12 should be audible, but in an a/b test what if there are differences in what bits #8 through #12 sound like, but the amplitude is still the same on both files at that point, you'll get a null, right? Extrapolate that out somewhat & let's say there are differences in bits #8 through #12 on sample points 3, 17, 1,000, 4,523, 7,560, etc, etc through 43,972... Now this is breaking things down well beyond what I think can be measured, if I'm not mistaken (I don't know of any way we could extract JUST that information from each file & play it back for an a/b test; but would not that be enough to have to "null-able" files that do actually sound somewhat different?

I guess what I'm saying is that since each sample in a musical track or full song file doesn't represent a pure, simple set of

content like a sample of a sine wave would - there's a whole world of harmonic structure in each sample of a song file, and I think (although I'll admit - I can't "prove") that there is plenty of room for some variables between the first bit & the last bit while still allowing for a null test to be successful.

No? Am I wacked out of my mind?

Neil

---

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)

Posted by [TCB](#) on Thu, 21 Dec 2006 15:06:38 GMT

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If you think data can't be written consistently, down to the last bit, over and over on a CD you better check to see that your Social Security Number, bank balances, credit card transactions, and paychecks are changing. Because they need to if that's what you believe.

TCB

"LaMont" <jjdpro@ameritech.net> wrote:

>

>See Detric, everthing is this life is not expalinable. Although we would like

>it to be  $2+2=4$ , the rality is that sometimes  $2+2=4.40$ ..Why, becuae the >the math is flawed. Why is the math flawed? Becuase we as humans are flawed.

>Say what you will about the metric system, which is a great tool.But, sometimes >working in inches and 16ths, 3/4s works better.

>

>When a guy like Roger Nichols bangs his preverbial head around this issue >as to why his mix sound different being rendered from different and sometimes >the same cd mastering devices is expalinable, however the explanation does >not jive with the science.

>Are we to believe that the Science we have today about digital audio is >the the Last word?? No.. In the future, some new science will come along >and either rebuff our current science or enhance it.

>

>We I and other say.. We drop a stereo wav file in a given daw)(unity gain) >using the same audio converter...We can hear the diference. And it's sonically >obvious..

>

>Lynns test is flawed because of the Roger Nichohls CD mastering problem. Things

>change when going to render to CD.

>

>Hey some people on this earth can hear and see better than others..That's

>just a fact  
>  
>"Dedric Terry" <dedric@echomg.com> wrote:  
>>Of course Paris sounds different on Lynn's sampler, that was audible, and  
>  
>>there are technical reasons why Paris will always sound different, but  
I  
>  
>>didn't like it better on the sampler CD, to be honest, though the  
>>differences were subtle. Also, we weren't talking about Acid vs. Sonar  
>  
>>specifically. I don't even bother with Acid as a DAW example - it's a  
loop  
>  
>>app. Vegas is a video app that has had life as an audio app to some degree,  
>  
>>but iMovie does audio as well, yet that doesn't really put it in the same  
>  
>>category as professional DAW apps like Nuendo, PTHD, Sequoia, etc. I use  
>  
>>Vegas for video, but not audio.  
>>  
>>On Lynn's sampler, Samplitude, Nuendo, Fairlight and the other natives  
don't  
>  
>>sound different and aren't different in the unity gain examples  
>>(even the PTHD mix cancels with these). If you hear two files sounding  
>  
>>differently that cancel to complete null, an audio difference isn't what  
>you  
>>are hearing. When there are differences in non-unity gain mix summing  
  
>>tests, you have an extra variable to account for - how is the gain  
>>calculated? Gain  
>>is non-linear (power), not adding two numbers together. So how is pan  
law  
>  
>>factored in, and where? Are your faders exactly the same, or 0.001dB  
>>variant?  
>>  
>>Also if you drop the same stereo file in two different pro audio apps and  
>  
>>hear a difference, one of the two apps is defective. There is nothing  
  
>>happening with a stereo file playback when no gain change or plugins are  
>  
>>active - just audio streaming to the driver from disk. If you hear a  
>>difference there, I would be quickly trying to find out why. Something

>is  
>>wrong.  
>>  
>>The point I am making is that these arguments usually come up as blanket  
>  
>>statements with no qualification of what exactly sounds  
>>different, why it might, or solid well reasoned attempts to find out why,  
>or  
>>if there could be a real difference, or just a perceived one.  
>>  
>>Usually the "use your ears" comment comes up when there is no technical  
>  
>>rebuttal for when the science and good  
>>ears agree. Of course "use your ears" first from a creative perspective,  
>  
>>but if you are making a technical, scientific statement, then such comments  
>>aren't a good foundation to work from. It's a great motto, but a bit of  
>a  
>>cop out in a technical discussion.  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMont" <jjdpro@ameriech.net> wrote in message news:45897f73\$1@linux...  
>>>  
>>> Hey Dedric and Neil,  
>>>  
>>> I reason I think that the Summing CD test(good intentions) were lame  
was  
>>> because.. If a person can;t hear the difference btw a stereo wav file  
>  
>>> that's  
>>> in Acid vs Sonar really needs a hearing test.  
>>>  
>>> For reason of my music work, I have to work with different DAWs, so I'm  
>  
>>> very  
>>> familiar with their sound qualities. My circle of producers and engineers  
>>> talk about the daw sonics all the time. It's really no big deal anymore..  
>>>  
>>> The same logic applies when Roger Nichols (a few) years back in his  
>>> article  
>>> about master CD's and that he found out that 4 differnt CD burners yeilded  
>>> differnt sonic results. Sure, he sated that Math is the Math :) but,  
his  
>>> and the masering engineers Ears told them soemthing was different.  
>>> Hummm???

>>> Now, back to DAW sonics. I can hear the difference btw Paris and Nuendo  
>vs  
>>> Pro Tools, Logic audio.. There is no math to this, this is an ear  
>>> thing..You  
>>> either hear or you don't.. Simple.  
>>> But, good ears can hear it. .  
>>>  
>>> I really think the problem is, noone want to no that their money that  
>  
>>> they've  
>>> spent on a given DAW, has sonic limitations or shall we say, just  
>>> different..  
>>>  
>>> I like that they all sound different. It's good to have choice when mixing  
>>> a song. Some DAWs, depending on the genre will yield better or the desired  
>>> results and than another.  
>>> EX. I would not mix a Acoustic jazz record today with Paris..reason,  
I'm  
>>> going for clarity at it's highest level.. For that project, It's either  
>  
>>> Neundo  
>>> or Pro Tools and may Samplitude..Why should I fight with Paris's thick,  
>  
>>> gooy  
>>> sonics, when I'm going for clarity. Well, Pro Tools and Nuendo/SX has  
>that  
>>> sound right out the gate.. Which makes my job a lot easier. simple. This  
>>> is not tosay that I could not get the job done in Paris..i could..But,  
>for  
>>> that Acoutic Jazz project , the other 2 daws gives me what I'm looking  
>  
>>> for  
>>> without even touching an eq..  
>>>  
>>> This is not all about math. As BrianT states: Use you ears..Forget the  
>  
>>> math..What  
>>> does knowing the math do for you anyway? Nothing, it just proves that  
>you  
>>> know the math. Does not tell you diddly about the sonics.. Just ask Roger  
>>> Nichols..  
>>>  
>>>  
>>> "Dedric Terry" <d@nospam.net> wrote:  
>>>>  
>>>>I know we disagree here Lamont and that's totally cool, so I won't take  
>>> this  
>>>>beyond this one response, and this isn't really directed to you, but

my  
>>> general  
>>>> thoughts on the matter.  
>>>>  
>>>> In Neil's "defense" (not that he needs it), I and others have done this  
>>> comparison  
>>>> to death and the conclusion I've come to is that people are 80% influenced  
>>>> by a change in environment (e.g. software interface) and 20% ears. Sorry  
>>>> to say it, but the difference in sound between floating point DAWs is  
> far  
>>>> from real. It's just good, albeit unintentional marketing created by  
>  
>>>> users  
>>>> and capitalized by manufacturers. Perceiving a "sound" in DAWs that  
> in  
>>> actuality  
>>>> process data identically, is a bad reason to pick a DAW, but of course  
>  
>>>> there  
>>>> is nothing wrong with thinking you hear a difference as long as it doesn't  
>>>> become an unwritten law of engineering at large. Preferring to work  
> with  
>>>> one or the other, and "feeling" better about it for whatever reason is  
> a  
>>>> great reason to pick one DAW over another.  
>>>>  
>>>> There was a recent thread that Nuendo handled gain through groups  
>>>> differently,  
>>>> so I put Nuendo, Sonar 6 (both 32 and 64-bit engines) and Sequoia 8.3  
> to  
>>>> the test - identical tests, setup to the 1/100th of a dB identically  
> and  
>>>> came up with absolutely no difference, either audible or scientific.  
  
> To  
>>>> be honest, this was the one test where I could have said, yes there is  
> an  
>>>> understandable difference between DAWs in a simple math function, and  
> the  
>>>> only one in the DAW that actually might make sense, yet even that did  
> not  
>>>> exist. The reason - math is math. You can paint it red, blue, silver  
> or  
>>>> dull grey, but it's still the same math unless the programmer was high  
> or  
>>>> completely incompetent when they wrote the code.  
>>>>  
>>>> I thought it was entirely possible the original poster had found something

>>>>different in Nuendo, but when it came down to really understanding and  
>  
>>>>reproducing  
>>>>what happens in DAW summing and gain structures accurately between each  
>>> DAW,  
>>>>there was none, nada, nil. The assertion was completely squashed. This  
>  
>>>>also  
>>>>showed me how easy it is for a wide range of professionals to misinterpret  
>>>>digital audio - whether hearing things, or just setting up a test with  
>a  
>>>>single missed variable that completely invalidates the whole process.  
>>>>  
>>>>If you hear a difference, great. I've thought I heard a difference doing  
>>>>similar comparisons, then changed my perspective (nothing else - not  
  
>>>>converters,  
>>>>nothing - just reset my expectations, and switched back and forth) and  
>  
>>>>could  
>>>>hear no difference.  
>>>>  
>>>>Just leave some room for other opinions when you post yours on this  
>>>>subject  
>>>>since it is very obvious that hearing is not as universally objective  
>and  
>>>>identically referenced as everyone might like to believe, and is highly  
>>> visually  
>>>>and environmentally affected. Some will hear differences in DAWs. There  
>>>>are Cubase SX 3 users claiming Cubase 4 sounds different. Sigh. Then  
>  
>>>>they  
>>>>realize they aren't even using the same project... or at least different  
>>>>EQs, or etc, etc....  
>>>>  
>>>>Say what you want about published summing tests, but Lynn's tests are  
>as  
>>>>accurate as it gets, and that bears out in the results (all floating  
point  
>>>>DAWs cancel and sound identical - if you are hearing a difference, you  
>are  
>>>>hearing things that aren't there, or you forgot to align their gain and  
>>> placement).  
>>>> I've worked with Lynn at least briefly enough to know his attention  
to  
>>> detail.  
>>>> In the same way people will disagree about PCs and Macs until neither  
>

>>>> exists,  
>>>>so will audio engineers disagree about DAWs. This is one debate that  
>will  
>>>>always exist as long as we have different ears, eyes, brains,... and  
  
>>>>opinions.  
>>>>  
>>>>  
>>>>What Neil has done is to prove that opinions are always going to differ  
>>> (i.e.  
>>>>no consensus on the "best" mix of the ones posted). And in truth everyone  
>>>>has a different perception of sound in general - not everyone wants to  
>  
>>>>hear  
>>>>things the same way, so we judge "best" from very different perspectives.  
>>>> There is no single gold standard. There are variations and mutated  
  
>>>> combinations,  
>>>>but all are subjective. That in and of itself implies very distinctly  
>  
>>>>that  
>>>>people can and will even perceive the exact same sound differently if  
>  
>>>>presented  
>>>>with any variable that changes the brain's interpretation, even if just  
>>> a  
>>>>visual distraction. Just change the lights in the room and see if you  
>  
>>>>perceive  
>>>>a song differently played back exactly the same way. Or have a cat run  
>>> across  
>>>>a desk while listening. Whether you care to admit it or not, it is there,  
>>>>and that is actually the beauty of how our sense interact to create  
>>>>perception.  
>>>> That may be our undoing with DAW comparison tests, but it's also what  
>  
>>>> keeps  
>>>>music fresh and creative, when we allow it to.  
>>>>  
>>>>So my suggestion is to use what makes you most creative, even if it's  
>just  
>>>>a "feeling" working with that DAW gives you - be it the workflow, the  
>GUI,  
>>>>or even the name brand reputation. But, as we all know, if you can't  
>make  
>>>>most any material sound good on whatever DAW you choose, the DAW isn't  
>the  
>>>>problem.



>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>"Neil" <IUOIU@OIU.com> wrote:  
>>>>>  
>>>>>That's interesting - all those DAW sonic interpretations, I  
>>>>>mean... I haven't had a chance to use all of those, so it's  
>>>>>good information.  
>>>>>  
>>>>>I still don't understand why you consider my summing  
>>>>>comparisons "lame", however - it was a fair set of tests;  
>>>>>the same mix summed in different ways. Not trying to prove a  
>>>>>point or to rig it so one sounded any better than the other - in  
>>>>>fact, if you recall the thread, different people liked different  
>>>>>summed versions for different reasons... there wasn't any one  
>>>>>version that stood out as being "the one" that everyone felt  
>>>>>sounded better. The only reason I didn't come right out & say  
>>>>>right away which version was which is so that I didn't bias  
>>>>>anyone's opinion beforehand by mentioning that... NOT to try  
>>>>>& "hide" anything or "trick" anyone, as you accused me of  
>>>>>  
>>>>>Sheesh!  
>>>>>  
>>>>>Neil  
>>>>>  
>>>>>  
>>>>>"Lamont" <jjdpro@ameritech.net> wrote:  
>>>>>>  
>>>>>>Hey Neil,  
>>>>>>  
>>>>>>All I'm saying is: All DAW software have their own unique sound.  
>>>>>>Despite  
>>>>>>what those lame summing test shows..  
>>>>>>  
>>>>>>PT-HD has a very distinct sound. A very polished sound, with a nice  
>top  
>>>>>>end,  
>>>>>>but with full audio spectrum represented. Mixer/Summing buss can be  
>  
>>>>>>pushed,  
>>>>>>but you have to watch it.  
>>>>>>  
>>>>>>Nuendo/SX: Has a very Clear, 2 dimension sound, that does not hype  
the  
>>>>top  
>>>>>>nor bottom end.  
>>>>>>

>>>>>Logic Audio: Very Broad- Aggressive sound, that really works for Rock  
>>> and  
>>>>>R & B/Gospel mixes.  
>>>>>  
>>>>>Digital Performer: With their hardware, superb audio quality. Full  
  
>>>>>bodied  
>>>>>sound .  
>>>>>  
>>>>>Sonar: Very flat sounding. I would say that Sonar is your most vanilla  
>>>>sound  
>>>>>DW on the market..  
>>>>>  
>>>>>Samplitude : A little less top end than Pro Tools. Full bodied 3d  
>>>>>sound..  
>>>>>  
>>>>>Paris: Dark sounding in comparison to the the other DAWs. But, has  
a  
>3d  
>>>>>sound  
>>>>>quality that's full bodied.  
>>>>>  
>>>>>I feel that you asking SX to be something it's not with some analog  
>  
>>>>>summing.  
>>>>>Especially for your genre of music..  
>>>>>  
>>>>>  
>>>>>  
>>>>>  
>>>>>"Neil" <IUOIU@OIU.com> wrote:  
>>>>>>  
>>>>>>"Lamont" <jjdpro@ameritech.net> wrote:  
>>>>>>>  
>>>>>>>"I'd disagree with you in this instance because I happen to think  
>the  
>>>>>Cubase  
>>>>>>>ones DO sound better."  
>>>>>>>  
>>>>>>>Then that SSL Engineer does not know what they are doing with board.  
>>>>There's  
>>>>>>>no way a mix coming off of that board SSL should sound better than  
>a  
>>>>ITB  
>>>>>>>Cubase SX mix..  
>>>>>>>  
>>>>>>>Sorry, that just does not jive. That engineer does not know how to  
>

>>>>>>>push  
>>>>>>>he  
>>>>>>>SSL or just not familiar with it.  
>>>>>>>  
>>>>>>>You're not really paying attention, are you? It was the same  
>>>>>>>engineer (me). And as far as whether or not I know how to use  
>>>>>>>that particular board, I guess that would be a matter of  
>>>>>>>your opinion. I don't think the SSL mixes are bad ones, I think  
>>>>>>>they came out good; I just think that you can hear more detail  
>>>>>>>in the ITB mixes in the examples I gave, and they have more  
>>>>>>>wideband frequency content from top to bottom.  
>>>>>>>  
>>>>>>>Anyway, my point of that particular comparison wasn't to say  
>>>>>>>"ITB mixes are better than using a large-format console that  
>>>>>>>costs somewhere in the six-figure range", the point of it was to  
>>>>>>>address a signal-chain suggestion that Paul had... he had  
>>>>>>>suggested perhaps that I needed to pick up a few pieces of  
>>>>>>>killer vintage gear, and I was just demonstrating that I think  
>>>>>>>the various signal chain components that I have here are on par  
>>>>>>>with most anything that can be found in heavy-hitter studios...  
>>>>>>>we used probably around \$100k's worth of mics & pre's on the  
>>>>>>>PTHD/SSL mixes, plus obviously you're looking at another  
>>>>>>>roughly \$100k for that particular console (40-channel E-series,  
>>>>>>>black EQ's, w/G-series Computer & Total Recall package), add in  
>>>>>>>the PTHD, outboard gear & whatnot, and you end up with  
>>>>>>>somewhere around a quarter-mil's worth of equipment involved in  
>>>>>>>that project. The project done at my place was done with my  
>>>>>>>gear, which certainly doesn't tally up to anywhere remotely  
>>>>>>>close to that cost & none of it bears a "vintage" stamp, but it  
>>>>>>>sounds competitive with the project that used all the heavy-  
>>>>>>>hitter stuff.  
>>>>>>>  
>>>>>>>Neil  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>

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Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Jamie K](#) on Thu, 21 Dec 2006 17:13:04 GMT  
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Because digital audio is simply individual amplitude samples taken at regular increments, if two tracks (sets of sample numbers) cancel out

completely they are, by definition, identical at every sample point.

Simple as that.

The music we hear is recreated from the sample point numbers when they are converted back to analog. As we know, sound carried through the air is an analog phenomenon.

The world of harmonic structure we hear comes from the combination of waveforms at different frequencies used in the music. The ability of a series of simple amplitude samples to accurately recreate such combined frequency information is determined by the frequency of the regular increments - the sample rate - how often an amplitude measurement is recorded.

Nyquist suggests using at least 2x the highest frequency you want to reproduce. But as long as the systems you are comparing are using the same sample rate, that part of the equation is removed as a variable.

The quality of the A to D and D to A converters plays a part in what we hear, but those stages can be removed as variables depending on what and how you test - for example by comparing the same digital file bounced digitally from different DAWs.

Cheers,  
-Jamie  
[www.JamieKrutz.com](http://www.JamieKrutz.com)

Neil wrote:

> "Dedric Terry" <[dedric@echomg.com](mailto:dedric@echomg.com)> wrote:  
>> The tests I did were completely blank down to -200 dB (far below the last  
>  
>> bit). It's safe to say there is no difference, even in  
>> quantization noise, which by technical rights, is considered below the level  
>  
>> of "cancellation" in such tests.  
>  
> I'm not necessarily talking about just the first bit or the  
> last bit, but also everything in between... what happens on bit  
> #12, for example? Everything on bit #12 should be audible, but  
> in an a/b test what if there are differences in what bits #8  
> through #12 sound like, but the amplitude is still the same on  
> both files at that point, you'll get a null, right? Extrapolate  
> that out somewhat & let's say there are differences in bits #8  
> through #12 on sample points 3, 17, 1,000, 4,523, 7,560, etc,  
> etc through 43,972... Now this is breaking things down well

> beyond what I think can be measured, if I'm not mistaken (I  
> dn't know of any way we could extract JUST that information  
> from each file & play it back for an a/b test; but would not  
> that be enough to have to "null-able" files that do actually  
> sound somewhat different?  
>  
> I guess what I'm saying is that since each sample in a musical  
> track or full song file doesn't represent a pure, simple set of  
> content like a sample of a sine wave would - there's a whole  
> world of harmonic structure in each sample of a song file, and  
> I think (although I'll admit - I can't "prove") that there is  
> plenty of room for some variables between the first bit & the  
> last bit while still allowing for a null test to be successful.  
>  
> No? Am I wacked out of my mind?  
>  
> Neil  
>  
>

---

---

Subject: Re: Neil's Dilemma (was: looking for De-esser plugin)  
Posted by [Dedric Terry](#) on Fri, 22 Dec 2006 05:16:50 GMT  
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---

Hi Neil,

Jamie is right. And you aren't wacked out - you are thinking this through in a reasonable manner, but coming to the wrong conclusion - easy to do given how confusing digital audio can be. Each word represents an amplitude point on a single curve that is changing over time, and can vary with a speed up to the Nyquist frequency (as Jamie described). The complex harmonic content we hear is actually the frequency modulation of a single waveform, that over a small amount of time creates the sound we translate - we don't really hear a single sample at a time, but thousands of samples at a time (1 sample alone could at most represent a single positive or negative peak of a 22,050Hz waveform).

If one bit doesn't cancel, esp. if it's a higher order bit than number 24, you may hear, and will see that easily, and the higher the bit in the dynamic range (higher order) the more audible the difference. Since each bit is 6dB of dynamic range, you can extrapolate how "loud" that bit's impact will be if there is a variation.

Now, obviously if we are talking about 1 sample in a 44.1k rate song, then it simply be a click (only audible if it's a high enough order bit) instead of an obvious musical difference, but that should never happen in a phase cancellation test between identical files higher than bit 24, unless there are clock sync problems, driver issues, or the DAW is an early alpha version. :-)

By definition of what DAWs do during playback and record, every audio stream has the same point in time (judged by the timeline) played back sample accurately, one word at a time, at whatever sample rate we are using. A phase cancellation test uses that fact to compare two audio files word for word (and hence bit for bit since each bit of a 24-bit word would be at the same bit slot in each 24-bit word). Assuming they are aligned to the same start point, sample accurately, and both are the same set of sample words at each sample point, bit for bit, and one is phase inverted, they will cancel through all 24 bits. For two files to cancel completely for the duration of the file, each and every bit in each word must be the exact opposite of that same bit position in a word at the same sample point. This is why zooming in on an FFT of the full difference file is valuable as it can show any differences in the lower order bits that wouldn't be audible. So even if there is no audible difference, the visual followup will show if the two files truly cancel even a levels below hearing, or outside of a frequency change that we will perceive.

When they don't cancel, usually there will be way more than 1 bit difference - it's usually one or more bits in the words for thousands of samples. From a musical standpoint this is usually in a frequency range (low freq, or high freq most often) - that will show up as the difference between them, and that usually happens due to some form of processing difference between the files, such as EQ, compression, frequency dependant gain changes, etc. That is what I believe you are thinking through, but when talking about straight summing with no gain change (or known equal gain changes), we are only looking at linear, one for one comparisons between the two files' frequency representations.

Regards,  
Dedric

> Neil wrote:

>> "Dedric Terry" <dedric@echomg.com> wrote:

>>> The tests I did were completely blank down to -200 dB (far below the

>>> last

>>  
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>>> level  
>>  
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>>  
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>> that be enough to have to "null-able" files that do actually  
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>> I think (although I'll admit - I can't "prove") that there is  
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>> last bit while still allowing for a null test to be successful.  
>>  
>> No? Am I wacked out of my mind?  
>>  
>> Neil  
>>

---

Subject: Re: (No subject)  
Posted by [Nil](#) on Fri, 22 Dec 2006 07:05:35 GMT  
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---

Dedric - first of all, great explanation - esp. your 2nd paragraph. Next, let's take a look at something in the form of the best "graph" I can do in this NG's format... let's assume that each dot in the simple graph below is a sample point on a segment of a waveform, and let's further assume that each "I" below represents four bits (I don't want to make it too vertically large, for ease of reading) - so we're dealing with a 16-bit wav file, with the 5th "dot" from the start point on

the left being a full-amplitude, zero-db-line 16 bit sample.

Now.... really, all I have to do to get a "null" is to have the amplitude match at each "dot" on the waveform, yes? This, of course, is a very simplistic graphic example, so bear with me... but if I have each "dot" matching in amplitude & therefore can get a null, what about the bits & content thereof in between the extremes between the maxes & zero-line crossings? Are you saying that there can be no variables in sound between those sections that would still result in a null? What about all the "l"s that represent bits in between the maxes & the minimums?

```

      .
     .l.
    .lll. What about the stuff in here?
   .lllll. ....or in here????
  ..lllllll.
-----
      .lllllll.
     .lllll. Again, what about this region?
    .lll. ... or this region?
     .l.
      .

```

Neil

---

---

Subject: Re: (No subject)  
Posted by [Dedric Terry](#) on Fri, 22 Dec 2006 08:24:20 GMT  
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---

Neil,

Actually what you are showing with the l's is the power of the waveform (area under the curve), not the bits. Only the curve itself is the actual amplitude of the wave. The amplitude as represented in 16 bit words would be shown on the y-axis as 65535 steps, and only represent the vertical dimension, or amplitude of a specific point in time, not the area under it. The x-axis is of course time - one dot per sample point, each sample point is represented one 16-bit word, stored at that point in time. Each word is used to define where on the y-axis (how far from 0 volts amplitude) that dot appears - 0000 0000 0000 0000 of course would be the 0 amplitude point. An amplitude of 0 volts would equate to a dB power of -infinity in the digital realm if



we have an infinite number of bits to subdivide the y axis with, but in reality 0 is effectively -144dB for 24-bit audio and -96dB for 16 bit.

Since we work with levels in dB in a DAW we start to think of waveforms as being defined by that quantity, but when the y axis is in dB, it's really telling us the power of that signal around a point in time (area under the curve over an average distance), not the amplitude.

There aren't additional points or content beneath the outline you drew. It's a bit non-intuitive, but think of audio as only existing as a function of a change in time and the concept makes more sense. Regardless of how complex the actual music is, there is still only a single waveform that reaches our ears from a single source - e.g. a single amplitude point at a given point in time. What we "hear" is how that waveform changes up and down, over a certain time period.

Regards,  
Dedric

"Neil" <IUOIU@OIU.com> wrote in message news:458b75af\$1@linux...

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>  
>  
> .  
> . I .

> . III . What about the stuff in here?  
> . IIIII . .....or in here????  
> . IIIIIII .  
> -----  
> . IIIIIII .  
> . IIIII . Again, what about this region?  
> . III . ... or this region?  
> . I .  
> .  
> .  
> Neil

---

---

Subject: Re: (No subject)...What's up under the hood?  
Posted by [LaMont](#) on Fri, 22 Dec 2006 15:16:53 GMT  
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---

Okay...

I guess what I'm saying is this:

-Is it possible that diferent DAW manufactuers "code" their app differently for sound results.

I the answer is yes, then,the real task is to discover or rather un-cover what's say: Motu's vision of summing, versus Digidesign, versus Steinberg and so on..

What's under the hood. To me and others,when Digi re-coded their summing engine, it was obvious that Pro Tools has an obvious top end (8k-10k) bump. Where as Steinberg's summing is very neutral.

"Dedric Terry" <dedric@echomg.com> wrote:

>Hi Neil,

>

>Jamie is right. And you aren't wacked out - you are thinking this through

>in a reasonable manner, but coming to the wrong

>conclusion - easy to do given how confusing digital audio can be. Each word

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>>> Neil  
>>>  
>

---

Subject: Re: (No subject)...What's up inder the hood?  
Posted by [Dedric Terry](#) on Fri, 22 Dec 2006 16:08:55 GMT  
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---

"LaMont" <jjdpro@ameritech.net> wrote in message news:458be8d5\$1@linux...  
>  
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> I guess what I'm saying is this:  
>  
> -Is it possible that diferent DAW manufactuers "code" their app  
> differently  
> for sound results.

Of course it is \*possible\* to do this, but only if the DAW has a specific sound shaping purpose beyond normal summing/mixing. Users talk about wanting developers to add a "Neve sound" or "API sound" option to summing engines, but that's really impractical given the amount of dsp required to make a decent emulation (with convolution, dynamic EQ functions, etc). For sake of not eating up all cpu processing, that could likely only surface as is a built in EQ, which no one wants universally in summing, and anyone can add at will already.

So it hasn't happened yet and isn't likely to as it detours from the basic tenant of audio recording - recreate what comes in as accurately as possible.

What Digi did in recoding their summing engine was try to recover some of the damage done by the 24-bit buss in Mix systems. Motorola 56k dsps are 24-bit fixed point chips and I think the new generation (321?) still is, but they use double words now for 48-bits). And though plugins could process at 48-bit by doubling up and using upper and lower 24-bit words for 48-bit outputs, the buss between chips was 24-bits, so they had to dither to 24-bits after every plugin. The mixer (if I recall correctly) also had a 24-bit buss, so what Digi did is to add a dither stage to the mixer to prevent this constant truncation of data. 24-bits isn't enough to cover summing for more than a few tracks without losing information in the 16-bit world, and in the 24-bit world some information will be lost, at least at the lowest levels.

Adding a dither stage (though I think they did more than that - perhaps implement a 48-bit double word stage as well), simply smoothed over the truncation that was happening, but it didn't solve the problem, so with HD they went to a double-word path - throughout I believe, including the path between chips. I believe the chips are still 24-bit, but by doubling up the processing (yes at a cost of twice the overhead), they get a 48-bit engine. This not only provided better headroom, but greater resolution. Higher bit depths subdivide the amplitude with greater resolution, and that's really where we get the definition of dynamic range - by lowering the signal to quantization noise ratio.

With DAWs that use 32-bit floating point math all the way through, the only reason for altering the summing is by error, and that's an error that would actually be hard to make and get past a very basic alpha stage of testing. There is a small difference in fixed point math and floating point math, or at least a theoretical difference in how it affects audio in certain cases, but not necessarily in the result for calculating gain in either for the same audio file. Where any differences might show up is complicated, and I believe only appear at levels below 24-bit (or in headroom with tracks pushed beyond 0dBFS), or when/if there are any differences in where each amplitude level is quantized.

Obviously there can be differences if the DAW has to use varying bit depths throughout a single summing path to accommodate hardware as well as software summing, since there may be truncation or rounding along the way, but that impacts the lowest bit level, and hence - spacial reproduction, reverb tails perhaps, and "depth", not the levels most music so the differences are most

often more subtle than not. But most modern DAWs have eliminated those "rough edges" in the math by increasing the bit depth to accommodate normal summing required for mixing audio.

So with Lynn's unity gain summing test (A files on the CD I believe), DAWs were never asked to sum beyond 24-bits, at least not on the upper end of the dynamic range, so everything that could represent 24-bits accurately would cancel. The only ones that didn't were ones that had a different bit depth and/or gain structure whether hybrid or native (e.g. Paris' subtracting 20dB from tracks and adding it to the buss). In this case, PTHD cancelled (when I tested it) with Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed vs. 32-bit float wasn't a factor.

When trying other tests, even when adding and subtracting gain, Nuendo, Sequoia and Sonar cancel - both audibly and visually at inaudible levels, which only proves that one isn't making an error when calculating basic gain. Since a dB is well defined, and the math to add gain is simple, they shouldn't. The fact that they all use 32-bit float all the way through eliminates a difference in data structure as well, and this just verifies that. There was a time that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor went, but it's 32-bit float all the way through now just as Sonar, Nuendo/Cubase, Samplitude/Sequoia, DP, Audition (I presume at least). I don't know what Acid or Live use. Saw promotes a fixed point engine, but I don't know if it is still 24-bit, or now 48 bit. That was an intentional choice by the developer, but he's the only one I know of that stuck with 24-bit for summing intentionally, esp. after the Digi Mix system mixer incident.

Long answer, but to sum up, it is certainly physically \*possible\* for a developer to code something differently intentionally, but not in reality likely since it would be breaking some basic fixed point or floating point math rules. Where the differences really showed up in the past is with PT Mix systems where the limitation was really significant - e.g. 24 bit with truncation at several stages.

That really isn't such an issue anymore. Given the differences in workflow, missing something in workflow or layout differences is easy enough to do (e.g. Sonar doesn't have group and busses the way Nuendo does, as it's outputs are actually driver outputs, not software busses, so in Sonar, busses are actually outputs, and sub busses are actually busses in Nuendo. There are no, or at least I haven't found the equivalent of a Nuendo group in Sonar - that affects the results of some tests (though not basic summing) if not taken into account, but when taken into account, they work exactly the same way).

So at least when talking about apps with 32-bit float all the way through, it's safe to say (since it has been proven) that summing isn't different unless there is an error somewhere, or variation in how the user duplicates the same mix in two different apps.

Imho, that's actually a very good thing - approaching a more consistent basis for recording and mixing from which users can make all of the decisions as to how the final product will sound and not be required to decide when purchasing a pricey console, and have to focus their business on clients who want "that sound". I believe we are actually closer to the pure definition of recording now than we once were.

Regards,  
Dedric

>  
> I the answer is yes, then, the real task is to discover or rather un-cover  
> what's say: Motu's vision of summing, versus Digidesign, versus Steinberg  
> and so on..  
>  
> What's under the hood. To me and others, when Digi re-coded their summing  
> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
> bump.  
> Where as Steinberg's summing is very neutral.  
>  
> "Dedric Terry" <dedric@echomg.com> wrote:  
>>Hi Neil,  
>>  
>>Jamie is right. And you aren't wacked out - you are thinking this through  
>  
>>in a reasonable manner, but coming to the wrong  
>>conclusion - easy to do given how confusing digital audio can be. Each  
> word  
>>represents an amplitude  
>>point on a single curve that is changing over time, and can vary with a  
>  
>>speed up to the Nyquist frequency (as Jamie described).  
>>The complex harmonic content we hear is actually the frequency modulation  
> of  
>>a single waveform,  
>>that over a small amount of time creates the sound we translate - we don't  
>  
>>really hear a single sample at a time,  
>>but thousands of samples at a time (1 sample alone could at most represent



> a  
>>single positive or negative peak  
>>of a 22,050Hz waveform).  
>>  
>>If one bit doesn't cancel, esp. if it's a higher order bit than number 24,  
>  
>>you may hear, and will see that easily,  
>>and the higher the bit in the dynamic range (higher order) the more  
>>audible  
>  
>>the difference.  
>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>that  
>  
>>bit's impact will be  
>>if there is a variation.  
>>  
>>Now, obviously if we are talking about 1 sample in a 44.1k rate song, then  
>  
>>it simply be a  
>>click (only audible if it's a high enough order bit) instead of an obvious  
>  
>>musical difference, but that should never  
>>happen in a phase cancellation test between identical files higher than  
> bit  
>>24, unless there are clock sync problems,  
>>driver issues, or the DAW is an early alpha version. :-)  
>>  
>>By definition of what DAWs do during playback and record, every audio  
>>stream  
>  
>>has the same point in time (judged by the timeline)  
>>played back sample accurately, one word at a time, at whatever sample  
>>rate  
>  
>>we are using. A phase cancellation test uses that  
>>fact to compare two audio files word for word (and hence bit for bit since  
>  
>>each bit of a 24-bit word would  
>>be at the same bit slot in each 24-bit word). Assuming they are aligned  
> to  
>>the same start point, sample  
>>accurately, and both are the same set of sample words at each sample  
>>point,  
>  
>>bit for bit, and one is phase inverted,  
>>they will cancel through all 24 bits. For two files to cancel completely  
>

>>for the duration of the file, each and every bit in each word  
>>must be the exact opposite of that same bit position in a word at the same  
>  
>>sample point. This is why zooming in on an FFT  
>>of the full difference file is valuable as it can show any differences in  
>  
>>the lower order bits that wouldn't be audible. So even if  
>>there is no audible difference, the visual followup will show if the two  
>  
>>files truly cancel even a levels below hearing, or  
>>outside of a frequency change that we will perceive.  
>>  
>>When they don't cancel, usually there will be way more than 1 bit  
>>difference - it's usually one or more bits in the words for  
>>thousands of samples. From a musical standpoint this is usually in a  
>>frequency range (low freq, or high freq most often) - that will  
>>show up as the difference between them, and that usually happens due to  
> some  
>>form of processing difference between the files,  
>>such as EQ, compression, frequency dependant gain changes, etc. That is  
> what  
>>I believe you are thinking through, but when  
>>talking about straight summing with no gain change (or known equal gain  
>  
>>changes), we are only looking at linear, one for one  
>>comparisons between the two files' frequency representations.  
>>  
>>Regards,  
>>Dedric  
>>  
>>> Neil wrote:  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>> The tests I did were completely blank down to -200 dB (far below the  
>  
>>>>> last  
>>>>>  
>>>>> bit). It's safe to say there is no difference, even in  
>>>>> quantization noise, which by technical rights, is considered below the  
>  
>>>>> level  
>>>>>  
>>>>> of "cancellation" in such tests.  
>>>>>  
>>>>> I'm not necessarily talking about just the first bit or the  
>>>>> last bit, but also everything in between... what happens on bit  
>>>>> #12, for example? Everything on bit #12 should be audible, but  
>>>>> in an a/b test what if there are differences in what bits #8  
>>>>> through #12 sound like, but the amplitude is still the same on

>>>> both files at that point, you'll get a null, right? Extrapolate  
>>>> that out somewhat & let's say there are differences in bits #8  
>>>> through #12 on sample points 3, 17, 1,000, 4,523, 7,560, etc,  
>>>> etc through 43,972... Now this is breaking things down well  
>>>> beyond what I think can be measured, if I'm not mistaken (I  
>>>> dn't know of any way we could extract JUST that information  
>>>> from each file & play it back for an a/b test; but would not  
>>>> that be enough to have to "null-able" files that do actually  
>>>> sound somewhat different?  
>>>>  
>>>> I guess what I'm saying is that since each sample in a musical  
>>>> track or full song file doesn't represent a pure, simple set of  
>>>> content like a sample of a sine wave would - there's a whole  
>>>> world of harmonic structure in each sample of a song file, and  
>>>> I think (although I'll admit - I can't "prove") that there is  
>>>> plenty of room for some variables between the first bit & the  
>>>> last bit while still allowing for a null test to be successful.  
>>>>  
>>>> No? Am I wacked out of my mind?  
>>>>  
>>>> Neil  
>>>>  
>>  
>

---

Subject: Re: (No subject)  
Posted by [TCB](#) on Fri, 22 Dec 2006 16:31:46 GMT  
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Neil,

You're using an analog waveform that is leading you to think incorrectly about sampling. This is (very roughly) how it would look if you're working with 16 bit samples.

```
0101010101010101
0101010111011101
0101110111010101
0101111111010100
0101110101111101
0111011101111101
0111110101110101
0100010111000100
0100011101010101
0001011100010101
0000010111111100
0001000001010111
```

0100000111110101  
0111011101010000  
0101011101000000  
0101011111000101  
0101010101010101

The easiest way to think of how the sampler works is that it looks at the incoming voltage to the converter and asks 'Is this in the top or bottom half of the possible amplitudes I can measure.' If it's in the top half it writes a 1, if it's in the bottom half, it writes a zero. The next bit asks, 'Now that I know which half of my measurable voltage I'm looking at, is the voltage in the top half of that half or the bottom half?' That's bit number two. Then it's on to, 'Now that I know what quarter it's in, is it in the top or bottom half of that quarter?' And so on sixteen times giving it a resolution of 2 to the sixteenth power.

In other words, asking if the bits under the sample would sound is like asking how the road would drive if it were 30 feet underground.

Now then, to get back to the original argument, people like me (and I think Dedric but I'll let him speak for himself) get a little hacked off when someone says, 'you have to use your ears' when it's possible using various computer tools to check exactly how many of those samples match in two given files. The nulling trick is just a very easy way to get a quick read on one aspect, which is to answer the question 'do these two files match?' But there are others and I've used them. And the sameness between properly written (by which I mean lacking in serious bugs) audio applications is startling and their differences so minor that other errors (analog cables, dust on the speaker cone, humidity and temperature in the room) are far more likely to cause a difference.

Personally I think this all stems from romanticism about music and the purity of art. I have yet to hear someone tell me they need financial calculations down to 25 decimal points. They need them done to (at most) five decimal points because the smallest commonly used financial divisor is the basis point, or one one hundredth of a penny. So internally you calculate to five decimal places and round up or down from there and get on with your life. As geeky as finance guys can get, nobody ever says, 'You know, Thad, that last basis point just isn't really punchy enough for this deal. LBO guys need really punchy returns, so can you run that calculation out a few more bits to get a punchier basis point?' Scientists are also extremely careful to keep 'false precision' out of their calculations, so if one instrument will measure to four decimal points and the others will measure to 12 they understand that everything the higher resolution instruments measure beyond four accurate decimal points is worthless. They usually won't even record the data to be sure they don't claim greater precision than they have, because that's considered a horribly embarrassing junior high school mistake. But musicians and audio engineers think that just because the data is sound data

somehow it enters a nebulous zone where that last one hundredth of a penny can be punchier. Hey, if it gets you through the day, that's fine by me, but there are things about digital audio that can be proven true or false using the data. For things that can't be proven true or false with the data itself there is ABY testing, which is a controlled way to use the most precise audio measuring instruments available (our ears, at least until bats will wear headphones) to see if things sound different. When it's not in the data, and it's not in the ABY, I say it doesn't exist.

TCB

"Neil" <IUOIU@OIU.com> wrote:

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>  
>  
> . I .  
> . I I I . What about the stuff in here?  
> . I I I I I . ....or in here????  
> . I I I I I I I .  
>-----  
> . I I I I I I I .  
> . I I I I I . Again, what about this region?  
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> . I .  
> .  
>  
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Subject: Re: (No subject)

Posted by [LaMont](#) on Fri, 22 Dec 2006 16:46:47 GMT

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---

Thad, I assume that you are referring to me (using your ears).

Look, I think we are talking about two different things here:

1) Digital data

2) Software (DAWS) coding

You and Dedric have been concentrating on the laws of Digital audio. That's fine. But, I'm talking about the Software that we use to decode our digital audio.

Like my previous post states, are we saying that DAW software can't be written for certain sonic results?

"TCB" <nobody@ishere.com> wrote:

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>In other words, asking if the bits under the sample would sound is like  
asking

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>>-----

>> . I I I I I I I I .

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>>

>>

>>Neil

>



Subject: Re: (No subject)

Posted by [TCB](#) on Fri, 22 Dec 2006 17:25:04 GMT

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Actually, I wasn't referring specifically to you, I hear similar things all the time all over the place. The first time I went through this on this forum a couple of years ago was the Great CD Burning Speed Debate. In that one Derek and I came up with about a gazillion ways to show that you could rip-burn-rip-burn over and over again at all kinds of different speeds and wind up with exactly the same data or audio CD. And I mean the same as in I slurped the whole audio file \*as a string\* into perl and checked the samples. Having done that, and thereby proven beyond a shadow of a doubt, I was told, roughly, that clearly I couldn't hear well enough for these esoteric discussions. 'Use your ears, dude.'

So, it is possible to write a DAW with a filter on the master bus? Yes, of course it is. Why anyone would want to do such a thing is beyond me since there are conventions that are pretty much constant throughout the digital audio world about how signals should be mixed together. So if DAW X is a little more present in the second to the top octave (I think you mentioned one being so) I would call that either a bug or mistaken perception. If I could do the export file, flip polarity trick and the files didn't null I'd say, 'Interesting, let's be sure my test is good. Is there an EQ on a track in one mix and not the other? Is there a group track that is doubling the guitars in one mix and not the other?' If, on the other hand, the tracks did null I'd say, 'Hmmmmmm, maybe I'm hearing a difference where there isn't one.'

Lastly, and this is just a quirk for me, I find it odd that musicians and audio engineers are so disinterested in taking seriously expert opinion. This is rampant in the audiophile world where off the record the engineers themselves will tell you they're not sure the \$3k speaker cables they used to hook up their new speaker line makes any difference. But with Neil, for example, his mixes are 20 times better than mine for that kind of music. If he gave me advice and opinion I would take it very seriously. But for some reason when people like me and Detric, who have developed extensive knowledge into how computers work, are very often brushed off very quickly. Detric isn't even a jerk about, while I'm a jerk about it only sometimes, so I find that reaction to be, well, odd. But like I said, whatever gets ya through the day, I'm not looking for converts and nobody is paying me to post here.

TCB

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>

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>>>

>>>

>>> .I.

>>> .III. What about the stuff in here?

>>> .IIII. ....or in here????

>>>.IIIIII.

>>>-----

>>> .IIIIII.

>>> .IIII. Again, what about this region?

>>> .III. ... or this region?

>>> .I.

>>> .

>>>

>>>Neil

>>

>

---

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Subject: Re: (No subject)

Posted by [erlilo](#) on Fri, 22 Dec 2006 17:48:26 GMT

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---

.....It seems you all have forgot to talk about the difference with listening from different monitors, with different "room problems", that is summing the results to our ears as a last instance.....

Erling

"LaMont" <jjdpro@ameritech.net> skrev i melding news:458c0fc6\$1@linux...

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Posted by [LaMont](#) on Fri, 22 Dec 2006 18:03:02 GMT  
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Subject: Re: (No subject)  
Posted by [Neil](#) on Fri, 22 Dec 2006 18:21:29 GMT  
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>to post here.

First of all, thanks for the compliment, and secondly, I hope I haven't come across as one of those who brushes off the facts stated by those more knowledgeable than I with regard to the technical aspects of all this stuff - I guess I'm part of the "Use your ears, but also pay attention to the data" crowd. I'm the first one to acknowledge that I don't understand some of the more technical elements of the digiworld, and it appears that my interpretations of how certain things work in the digital realm are/were flawed... so, despite the fact that you're not paid to post here, I thank you & Detric & others for

getting into the detail you have... some of it's over my head, admittedly, but you've explained it clearly enough to where I "get it" a little bit better.

Neil

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Subject: Re: (No subject)...What's up inder the hood?

Posted by [LaMont](#) on Fri, 22 Dec 2006 18:24:16 GMT

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---

Dedric good post..

However, I have PT-M-Powered/M-audio 410 interface for my laptop and it has that same sound (no eq, zero fader) that HD does. I know their use the same 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero fader)..results. different sonic character.

PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm just taking about a stereo wav file nulled with no eq..nothing ..zilch..nada..

Now, there are devices (keyboards, dum machines) on the market today that have a Master Buss Compressor and EQ set to on with the top end notched up. Why? because it gives their product an competitive advantageover the competition.. Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.

So, why would'nt a DAW manufactuer code in an extra (ooommf) to make their DAW sound better. Especially, given the "I hate Digital Summing" crowd? And, If I'm a DAW manufactuer, what would give my product a sonic edge over the competition?

We live in the "louder is better" audio world these days, so a DAW that can catch my attention 'sonically" will probaly will get the sell. That's what happend to me back in 1997 when I heard Paris. I was floored!!! Still to this day, nothing has floored me like that "Road House Blues Demo" I heard on Paris.

Was it the hardware ? was it the software. I remember talking with Edmund at the 2000 winter Namm, and told me that he & Steve set out to reproduce the sonics of big buck analog board (eq's) and all.. And, summing was a big big issue for them because they (ID) thought that nobody has gotten it(summing) right. And by right, they meant, behaved like a console with a wide lane for all of those tracks..

"Dedric Terry" <[dedric@echomg.com](mailto:dedric@echomg.com)> wrote:



>"LaMont" <jjdpro@ameritech.net> wrote in message news:458be8d5\$1@linux...  
>>  
>> Okay...  
>> I guess what I'm saying is this:  
>>  
>> -Is it possible that diferent DAW manufactuers "code" their app  
>> differently  
>> for sound results.  
>  
>Of course it is \*possible\* to do this, but only if the DAW has a specific  
  
>sound shaping purpose  
>beyond normal summing/mixing. Users talk about wanting developers to add  
>a  
>"Neve sound" or "API sound" option to summing engines,  
>but that's really impractical given the amount of dsp required to make a  
  
>decent emulation (with convolution, dynamic EQ functions,  
>etc). For sake of not eating up all cpu processing, that could likely only  
  
>surface as is a built in EQ, which  
>no one wants universally in summing, and anyone can add at will already.  
>  
>So it hasn't happened yet and isn't likely to as it detours from the basic  
  
>tenant of audio recording - recreate what comes in as  
>accurately as possible.  
>  
>What Digi did in recoding their summing engine was try to recover some  
>of the damage done by the 24-bit buss in Mix systems. Motorola 56k dsp's  
>are  
>24-bit fixed point chips and I think  
>the new generation (321?) still is, but they use double words now for  
>48-bits). And though plugins could process at 48-bit by  
>doubling up and using upper and lower 24-bit words for 48-bit outputs, the  
  
>buss  
>between chips was 24-bits, so they had to dither to 24-bits after every  
  
>plugin. The mixer (if I recall correctly) also  
>had a 24-bit buss, so what Digi did is to add a dither stage to the mixer  
>to  
>prevent this  
>constant truncation of data. 24-bits isn't enough to cover summing for  
>more  
>than a few tracks without  
>losing information in the 16-bit world, and in the 24-bit world some  
>information will be lost, at least at the lowest levels.

>  
>Adding a dither stage (though I think they did more than that - perhaps  
>implement a 48-bit double word stage as well),  
>simply smoothed over the truncation that was happening, but it didn't solve  
  
>the problem, so with HD  
>they went to a double-word path - throughout I believe, including the path  
  
>between chips. I believe the chips  
>are still 24-bit, but by doubling up the processing (yes at a cost of twice  
  
>the overhead), they get a 48-bit engine.  
>This not only provided better headroom, but greater resolution. Higher  
bit  
>depths subdivide the amplitude with greater resolution, and that's  
>really where we get the definition of dynamic range - by lowering the signal  
  
>to quantization noise ratio.  
>  
>With DAWs that use 32-bit floating point math all the way through, the only  
  
>reason for altering the summing  
>is by error, and that's an error that would actually be hard to make and  
get  
>past a very basic alpha stage of testing.  
>There is a small difference in fixed point math and floating point math,  
or  
>at least a theoretical difference in how it affects audio  
>in certain cases, but not necessarily in the result for calculating gain  
in  
>either for the same audio file. Where any differences might show up is  
  
>complicated, and I believe only appear at levels below 24-bit (or in  
>headroom with tracks pushed beyond 0dBFS), or when/if  
>there are any differences in where each amplitude level is quantized.  
>  
>Obviously there can be differences if the DAW has to use varying bit depths  
  
>throughout a single summing path to accommodate hardware  
>as well as software summing, since there may be truncation or rounding along  
  
>the way, but that impacts the lowest bit  
>level, and hence - spacial reproduction, reverb tails perhaps, and "depth",  
  
>not the levels most music so the differences are most  
>often more subtle than not. But most modern DAWs have eliminated those

>"rough edges" in the math by increasing the bit depth to accomodate normal

>summing required for mixing audio.

>

>So with Lynn's unity gain summing test (A files on the CD I believe), DAWs

>were never asked to sum beyond 24-bits,

>at least not on the upper end of the dynamic range, so everything that could

>represent 24-bits accurately would cancel. The only ones

>that didn't were ones that had a different bit depth and/or gain structure

>whether hybrid or native

>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss). In

>this case, PTHD cancelled (when I tested it) with

>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed vs.

>32-bit float wasn't a factor.

>

>When trying other tests, even when adding and subtracting gain, Nuendo,

>Sequoia and Sonar cancel - both audibly and

>visually at inaudible levels, which only proves that one isn't making an

>error when calculating basic gain. Since a dB is well defined,

>and the math to add gain is simple, they shouldn't. The fact that they

all

>use 32-bit float all the way through eliminates a difference

>in data structure as well, and this just verifies that. There was a time

>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor went,

>but it's 32-bit float all the way through now just as Sonar, Nuendo/Cubase,

>Samplitude/Sequoia, DP, Audition (I presume at least).

>I don't know what Acid or Live use. Saw promotes a fixed point engine,

but

>I don't know if it is still 24-bit, or now 48 bit.

>That was an intentional choice by the developer, but he's the only one I

>know of that stuck with 24-bit for summing

>intentionally, esp. after the Digi Mix system mixer incident.

>

>Long answer, but to sum up, it is certainly physically \*possible\* for a

>developer to code something differently intentionally, but not

>in reality likely since it would be breaking some basic fixed point or

>floating point math rules. Where the differences really

>showed up in the past is with PT Mix systems where the limitation was really

>significant - e.g. 24 bit with truncation at several stages.

>

>That really isn't such an issue anymore. Given the differences in workflow,

>missing something in workflow or layout differences

>is easy enough to do (e.g. Sonar doesn't have group and busses the way

>Nuendo does, as it's outputs are actually driver outputs,

>not software busses, so in Sonar, busses are actually outputs, and sub

>busses are actually busses in Nuendo. There are no,

>or at least I haven't found the equivalent of a Nuendo group in Sonar -

that

>affects the results of some tests (though not basic

>summing) if not taken into account, but when taken into account, they work

>exactly the same way).

>

>So at least when talking about apps with 32-bit float all the way through,

>it's safe to say (since it has been proven) that summing isn't different

>unless

>there is an error somewhere, or variation in how the user duplicates the

>same mix in two different apps.

>

>Imho, that's actually a very good thing - approaching a more consistent

>basis for recording and mixing from which users can make all

>of the decisions as to how the final product will sound and not be required

>to decide when purchasing a pricey console, and have to

>focus their business on clients who want "that sound". I believe we are

>actually closer to the pure definition of recording now than

>we once were.

>

>Regards,

>Dedric

>

>

>>

>> I the answer is yes, then, the real task is to discover or rather un-cover

>> what's say: Motu's vision of summing, versus Digidesign, versus Steinberg

>> and so on..

>>

>> What's under the hood. To me and others, when Digi re-coded their summing

>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)

>> bump.

>> Where as Steinberg's summing is very neutral.

>>

>> "Dedric Terry" <dedric@echomg.com> wrote:

>>>Hi Neil,

>>>

>>>Jamie is right. And you aren't wacked out - you are thinking this through

>>

>>>in a reasonable manner, but coming to the wrong

>>>conclusion - easy to do given how confusing digital audio can be. Each

>> word

>>>represents an amplitude

>>>point on a single curve that is changing over time, and can vary with

a

>>

>>>speed up to the Nyquist frequency (as Jamie described).

>>>The complex harmonic content we hear is actually the frequency modulation

>> of

>>>a single waveform,

>>>that over a small amount of time creates the sound we translate - we don't

>>

>>>really hear a single sample at a time,

>>>but thousands of samples at a time (1 sample alone could at most represent

>> a

>>>single positive or negative peak

>>>of a 22,050Hz waveform).

>>>

>>>If one bit doesn't cancel, esp. if it's a higher order bit than number

24,

>>

>>>you may hear, and will see that easily,

>>>and the higher the bit in the dynamic range (higher order) the more

>>>audible

>>

>>>the difference.

>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"

>>>that

>>

>>>bit's impact will be

>>>if there is a variation.

>>>

>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,

then

>>

>>>it simply be a

>>>click (only audible if it's a high enough order bit) instead of an obvious  
>>  
>>>musical difference, but that should never  
>>>happen in a phase cancellation test between identical files higher than  
>> bit  
>>>24, unless there are clock sync problems,  
>>>driver issues, or the DAW is an early alpha version. :-)  
>>>  
>>>By definition of what DAWs do during playback and record, every audio  
  
>>>stream  
>>  
>>>has the same point in time (judged by the timeline)  
>>>played back sample accurately, one word at a time, at whatever sample  
  
>>>rate  
>>  
>>>we are using. A phase cancellation test uses that  
>>>fact to compare two audio files word for word (and hence bit for bit since  
>>  
>>>each bit of a 24-bit word would  
>>>be at the same bit slot in each 24-bit word). Assuming they are aligned  
>> to  
>>>the same start point, sample  
>>>accurately, and both are the same set of sample words at each sample  
>>>point,  
>>  
>>>bit for bit, and one is phase inverted,  
>>>they will cancel through all 24 bits. For two files to cancel completely  
>>  
>>>for the duration of the file, each and every bit in each word  
>>>must be the exact opposite of that same bit position in a word at the  
same  
>>  
>>>sample point. This is why zooming in on an FFT  
>>>of the full difference file is valuable as it can show any differences  
in  
>>  
>>>the lower order bits that wouldn't be audible. So even if  
>>>there is no audible difference, the visual followup will show if the two  
>>  
>>>files truly cancel even a levels below hearing, or  
>>>outside of a frequency change that we will perceive.  
>>>  
>>>When they don't cancel, usually there will be way more than 1 bit  
>>>difference - it's usually one or more bits in the words for  
>>>thousands of samples. From a musical standpoint this is usually in a  
>>>frequency range (low freq, or high freq most often) - that will

>>>show up as the difference between them, and that usually happens due to  
>> some  
>>>form of processing difference between the files,  
>>>such as EQ, compression, frequency dependant gain changes, etc. That is  
>> what  
>>>I believe you are thinking through, but when  
>>>talking about straight summing with no gain change (or known equal gain  
>>  
>>>changes), we are only looking at linear, one for one  
>>>comparisons between the two files' frequency representations.  
>>>  
>>>Regards,  
>>>Dedric  
>>>  
>>>> Neil wrote:  
>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>> The tests I did were completely blank down to -200 dB (far below the  
>>  
>>>>>> last  
>>>>>>  
>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>> quantization noise, which by technical rights, is considered below  
the  
>>  
>>>>>> level  
>>>>>>  
>>>>>> of "cancellation" in such tests.  
>>>>>>  
>>>>>> I'm not necessarily talking about just the first bit or the  
>>>>>> last bit, but also everything in between... what happens on bit  
>>>>>> #12, for example? Everything on bit #12 should be audible, but  
>>>>>> in an a/b test what if there are differences in what bits #8  
>>>>>> through #12 sound like, but the amplitude is still the same on  
>>>>>> both files at that point, you'll get a null, right? Extrapolate  
>>>>>> that out somewhat & let's say there are differences in bits #8  
>>>>>> through #12 on sample points 3, 17, 1,000, 4,523, 7,560, etc,  
>>>>>> etc through 43,972... Now this is breaking things down well  
>>>>>> beyond what I think can be measured, if I'm not mistaken (I  
>>>>>> don't know of any way we could extract JUST that information  
>>>>>> from each file & play it back for an a/b test; but would not  
>>>>>> that be enough to have to "null-able" files that do actually  
>>>>>> sound somewhat different?  
>>>>>>  
>>>>>> I guess what I'm saying is that since each sample in a musical  
>>>>>> track or full song file doesn't represent a pure, simple set of  
>>>>>> content like a sample of a sine wave would - there's a whole  
>>>>>> world of harmonic structure in each sample of a song file, and  
>>>>>> I think (although I'll admit - I can't "prove") that there is

>>>> plenty of room for some variables between the first bit & the  
>>>> last bit while still allowing for a null test to be successful.  
>>>>  
>>>> No? Am I wacked out of my mind?  
>>>>  
>>>> Neil  
>>>>  
>>>  
>>  
>  
>

---

---

Subject: Re: (No subject)  
Posted by [Jamie K](#) on Fri, 22 Dec 2006 18:46:56 GMT  
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---

True, every part of the signal chain is important. But I don't think anyone here is assuming otherwise.

For testing purposes, the monitors and room can be eliminated as a variable by using the same monitors and room when auditioning the output of several DAWs. And clamp your head into the exact same position. :^)

The idea is to design any test so that all variables except the DAWs are eliminated. Then, if there is a difference, it can only be because the DAWs handle audio files differently. And if there is no difference, they handle audio files identically.

Cheers,  
-Jamie  
[www.JamieKruz.com](http://www.JamieKruz.com)

erlilo wrote:

> ....It seems you all have forgot to talk about the difference with listening  
> from different monitors, with different "room problems", that is summing the  
> results to our ears as a last instance.....  
>  
> Erling  
>  
>  
> "LaMont" <[jjdpro@ameritech.net](mailto:jjdpro@ameritech.net)> skrev i melding news:458c0fc6\$1@linux...  
>> Thad,  
>> I think your points are valid. However I think the reason most Recording  
>> engineers don't like to talk Audio science, is because of the  
>> "unexplainable"  
>> anomolies that occurr with sound. Matters not if it's digital or analog,



>> but rather how does it sound..  
>>  
>> We need factions like AES who discuss such theoretical and new ideas and  
>> advancements in audio reproduction. However, once the science down, then  
>> comes the art of it all.. Music is still the reason for whatwe are  
>> discussing.  
>> Music is emotional, yet is a science as well.  
>>  
>> For your camp to continue to de-value the human side (use your ears) of  
>> the  
>> equation is not right as well.  
>>  
>> I think both sides are right, but the science campers cannot speak to a  
>> guy  
>> who's main tool is his "ears" and not a scope.  
>>  
>>  
>> "TCB" <nobody@ishere.com> wrote:  
>>> Actually, I wasn't referring specifically to you, I hear similar things  
>> all  
>>> the time all over the place. The first time I went through this on this  
>> forum  
>>> a couple of years ago was the Great CD Burning Speed Debate. In that one  
>>> Derek and I came up with about a gazillion ways to show that you could  
>>> rip-burn-rip-burn  
>>> over and over again at all kinds of different speeds and wind up with  
>>> exactly  
>>> the same data or audio CD. And I mean the same as in I slurped the whole  
>>> audio file \*as a string\* into perl and checked the samples. Having done  
>> that,  
>>> and thereby proven beyond a shadow of a doubt, I was told, roughly, that  
>>> clearly I couldn't hear well enough for these esoteric discussions. 'Use  
>>> your ears, dude.'  
>>>  
>>> So, it is possible to write a DAW with a filter on the master bus? Yes,  
>> of  
>>> course it is. Why anyone would want to do such a thing is beyond me since  
>>> there are conventions that are pretty much constant throughout the digital  
>>> audio world about how signals should be mixed together. So if DAW X is a  
>>> little more present in the second to the top octave (I think you mentioned  
>>> one being so) I would call that either a bug or mistaken perception. If  
>> I  
>>> could do the export file, flip polarity trick and the files didn't null  
>> I'd  
>>> say, 'Interesting, let's be sure my test is good. Is there an EQ on a  
>>> track  
>>> in one mix and not the other? Is there a group track that is doubling the  
>>> guitars in one mix and not the other?' If, on the other hand, the tracks

>>> did null I'd say, 'Hmmmmmm, maybe I'm hearing a difference where there  
>>> isn't  
>>> one.'  
>>>  
>>> Lastly, and this is just a quirk for me, I find it odd that musicians and  
>>> audio engineers are so disinterested in taking seriously expert opinion.  
>>> This is rampant in the audiophile world where off the record the engineers  
>>> themselves will tell you they're not sure the \$3k speaker cables they used  
>>> to hook up their new speaker line makes any difference. But with Neil, for  
>>> example, his mixes are 20 times better than mine for that kind of music.  
>>> If he gave me advice and opinion I would take it very seriously. But for  
>>> some reason when people like me and Detric, who have developed extensive  
>>> knowledge into how computers work, are very often brushed off very  
>>> quickly.  
>>> Detric isn't even a jerk about, while I'm a jerk about it only sometimes,  
>>> so I find that reaction to be, well, odd. But like I said, whatever gets  
>>> ya through the day, I'm not looking for converts and nobody is paying me  
>>> to post here.  
>>>  
>>> TCB  
>>>  
>>> "LaMont" <jjdpro@ameritech.net> wrote:  
>>>> Thad, I assume that you are referring to me (using your ears).  
>>>>  
>>>> Look, I think we are talking about two different things here:  
>>>>  
>>>> 1) Digital data  
>>>>  
>>>> 2) Software (DAWS) coding  
>>>>  
>>>> You and Detric have been concentrating on the laws of Digital audio.  
>>>> That's  
>>>> fine. But, I'm talking about the Software that we use to decode our  
>>>> digital  
>>>> audio.  
>>>>  
>>>> Like my previous post states, are we saying that DAW software can't be  
>> written  
>>>> for certain sonic results?  
>>>>  
>>>>  
>>>> "TCB" <nobody@ishere.com> wrote:  
>>>>> Neil,  
>>>>>  
>>>>> You're using an analog waveform that is leading you to think incorrectly  
>>>>> about sampling. This is (very roughly) how it would look if you're  
>>>>> working  
>>>>> with 16 bit samples.

```
>>>>
>>>> 0101010101010101
>>>> 0101010111011101
>>>> 0101110111010101
>>>> 0101111111010100
>>>> 0101110101111101
>>>> 0111011101111101
>>>> 0111110101110101
>>>> 0100010111000100
>>>> 0100011101010101
>>>> 0001011100010101
>>>> 0000010111111100
>>>> 0001000001010111
>>>> 0100000111110101
>>>> 0111011101010000
>>>> 0101011101000000
>>>> 0101011111000101
>>>> 0101010101010101
```

```
>>>>
>>>> The easiest way to think of how the sampler works is that it looks at
>> the
>>>> incoming voltage to the converter and asks 'Is this in the top or bottom
>>>> half of the possible amplitudes I can measure.' If it's in the top half
>>>> it
>>>> writes a 1, if it's in the bottom half, it writes a zero. The next bit
>>> asks,
>>>> 'Now that I know which half of my measurable voltage I'm looking at, is
>>>> the
>>>> voltage in the top half of that half or the bottom half?' That's bit
>>>> number
>>>> two. Then it's on to, 'Now that I know what quarter it's it, is it in
>> the
>>>> top or bottom half of that quarter?' And so on sixteen time giving it
>>> a
>>>> resolution
>>>> of 2 to the sixteenth power.
>>>>
>>>> In other words, asking if the bits under the sample would sound is like
>>>> asking
>>>> how the road would drive if it were 30 feet underground.
>>>>
>>>> Now then, to get back to the original argument, people like me (and I
>>> think
>>>> Dedric but I'll let him speak for himself) get a little hacked off when
>>>> someone
>>>> says, 'you have to use your ears' when it's possible using various
>>>> computer
>>>> tools to check exactly how many of those samples match in two given
```

>>>> files.  
>>>> The nulling trick is just a very easy way to get a quick read on one  
>>>> aspect,  
>>>> which is to answer the question 'do these two files match?' But there  
>> are  
>>>> others and I've used them. And the sameness between properly written (by  
>>>> which I mean lacking in serious bugs) audio applications is startling  
>> and  
>>>> their differences so minor that other errors (analog cables, dust on the  
>>>> speaker cone, humidity and temperature in the room) are far more likely  
>>>> to  
>>>> cause a difference.  
>>>>  
>>>> Personally I think this all stems from romanticism about music and the  
>>> purity  
>>>> of art. I have yet to hear someone tell me they need financial  
>>>> calculations  
>>>> down to 25 decimal points. They need them done to (at most) five decimal  
>>>> points because the smallest commonly used financial divisor is the basis  
>>>> point, or one one hundredth of a penny. So internally you calculate to  
>>> five  
>>>> decimal places and round up or down from there and get on with your  
>>>> life.  
>>>> As geeky as finance guys can get, nobody ever says, 'You know, Thad,  
>>>> that  
>>>> last basis point just isn't really punchy enough for this deal. LBO guys  
>>>> need really punchy returns, so can you run that calculation out a few  
>>> more  
>>>> bits to get a punchier basis point?' Scientists are also extremely  
>>>> careful  
>>>> to keep 'false precision' out of their calculations, so if one  
>>>> instrument  
>>>> will measure to four decimal points and the others will measure to 12  
>>> they  
>>>> understand that everything the higher resolution instruments measure  
>>>> beyond  
>>>> four accurate decimal points is worthless. They usually won't even  
>>>> record  
>>>> the data to be sure they don't claim greater precision than they have,  
>>> because  
>>>> that's considered a horribly embarrassing junior high school mistake.  
>>> But  
>>>> musicians and audio engineers think that just because the data is sound  
>>>> data  
>>>> somehow it enters a nebulous zone where that last one hundredth of a  
>>>> penny  
>>>> can be punchier. Hey, if it gets you through the day, that's fine by me,  
>>>> but there are things about digital audio that can be proven true or

```

>>>>> false
>>>>> using the data. For things that can't be proven true or false with the
>>>>> data
>>>>> itself there is ABY testing, which is a controlled way to use the most
>>>>> precise
>>>>> audio measuring instruments available (our ears, at least until bats
>>>>> will
>>>>> wear headphones) to see if things sound different. When it's not in the
>>>>> data,
>>>>> and it's not in the ABY, I say it doesn't exist.
>>>>>
>>>>> TCB
>>>>>
>>>>> "Neil" <IUOIU@OIU.com> wrote:
>>>>>> Deduc - first of all, great explanation - esp. your 2nd
>>>>>> paragraph. Next, let's take a look at something in the form of
>>>>>> the best "graph" I can do in this NG's format... let's assume
>>>>>> that each dot in the simple graph below is a sample point on a
>>>>>> segment of a waveform, and let's further assume that each "I"
>>>>>> below represents four bits (I don't want to make it too
>>>>>> vertically large, for ease of reading) - so we're dealing with
>>>>>> a 16-bit wav file, with the 5th "dot" from the start point on
>>>>>> the left being a full-amplitude, zero-db-line 16 bit sample.
>>>>>>
>>>>>> Now.... really, all I have to do to get a "null" is to have the
>>>>>> amplitude match at each "dot" on the waveform, yes? This, of
>>>>>> course, is a very simplistic graphic example, so bear with
>>>>>> me... but if I have each "dot" matching in amplitude &
>>>>>> therefore can get a null, what about the bits & content thereof
>>>>>> in between the extremes between the maxes & zero-line
>>>>>> crossings? Are you saying that there can be no variables in
>>>>>> sound between those sections that would still result in a null?
>>>>>> What about all the "I"s that represent bits in between the
>>>>>> maxes & the minimums?
>>>>>>
>>>>>> .
>>>>>> . I .
>>>>>> . I I I . What about the stuff in here?
>>>>>> . I I I I I . .....or in here????
>>>>>> . I I I I I I I .
>>>>>> -----
>>>>>> . I I I I I I I .
>>>>>> . I I I I I . Again, what about this region?
>>>>>> . I I I . ... or this region?
>>>>>> . I .
>>>>>> .
>>>>>>
>>>>>> Neil

```

>  
>

---

Subject: Re: (No subject)  
Posted by [TCB](#) on Fri, 22 Dec 2006 20:07:26 GMT  
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First of all, I don't represent a 'camp.' Second, music is emotional for us, not the computer. The computer doesn't care if it's calculating reverb tails or running SQL queries. So there are some things about digital audio that we can say are true or false absolutely, or to a certain predictable degree of error. To argue against those things with the 'use your ears' argument is as useful as arguing about gravity, and whether you believe in gravity or not you still ain't gonna fall up when you jump off the park bench. For the rest, I've never said here or anywhere that ears shouldn't be used, but only that claims should be backed up by repeatable, statistically significant results in careful tests. So 'everybody who can hear will hear this' doesn't cut it for me. 'We did this test under these conditions and these were the results' does.

TCB

"LaMont" <jjdpro@ameritech.net> wrote:

>  
>Thad,  
>I think your points are valid. However I think the reason most Recording  
>engineers don't like to talk Audio science, is because of the "unexplainable"  
>anomalies that occur with sound. Matters not if it's digital or analog,  
>but rather how does it sound..  
>  
>We need factions like AES who discuss such theoretical and new ideas and  
>advancements in audio reproduction. However, once the science down, then  
>comes the art of it all.. Music is still the reason for what we are discussing.  
>Music is emotional, yet is a science as well.  
>  
>For your camp to continue to de-value the human side (use your ears) of  
the  
>equation is not right as well.  
>  
>I think both sides are right, but the science campers cannot speak to a  
guy  
>who's main tool is his "ears" and not a scope.  
>  
>  
>"TCB" <nobody@ishere.com> wrote:  
>>  
>>Actually, I wasn't referring specifically to you, I hear similar things

>all  
>>the time all over the place. The first time I went through this on this  
>forum  
>>a couple of years ago was the Great CD Burning Speed Debate. In that one  
>>Derek and I came up with about a gazillion ways to show that you could  
rip-burn-rip-burn  
>>over and over again at all kinds of different speeds and wind up with exactly  
>>the same data or audio CD. And I mean the same as in I slurped the whole  
>>audio file \*as a string\* into perl and checked the samples. Having done  
>that,  
>>and thereby proven beyond a shadow of a doubt, I was told, roughly, that  
>>clearly I couldn't hear well enough for these esoteric discussions. 'Use  
>>your ears, dude.'  
>>  
>>So, it is possible to write a DAW with a filter on the master bus? Yes,  
>of  
>>course it is. Why anyone would want to do such a thing is beyond me since  
>>there are conventions that are pretty much constant throughout the digital  
>>audio world about how signals should be mixed together. So if DAW X is  
>a  
>>little more present in the second to the top octave (I think you mentioned  
>>one being so) I would call that either a bug or mistaken perception. If  
>I  
>>could do the export file, flip polarity trick and the files didn't null  
>I'd  
>>say, 'Interesting, let's be sure my test is good. Is there an EQ on a track  
>>in one mix and not the other? Is there a group track that is doubling the  
>>guitars in one mix and not the other?' If, on the other hand, the tracks  
>>did null I'd say, 'Hmmmmmm, maybe I'm hearing a difference where there  
isn't  
>>one.'  
>>  
>>Lastly, and this is just a quirk for me, I find it odd that musicians and  
>>audio engineers are so disinterested in taking seriously expert opinion.  
>>This is rampant in the audiophile world where off the record the engineers  
>>themselves will tell you they're not sure the \$3k speaker cables they used  
>>to hook up their new speaker line makes any difference. But with Neil,  
for  
>>example, his mixes are 20 times better than mine for that kind of music.  
>>If he gave me advice and opinion I would take it very seriously. But for  
>>some reason when people like me and Dedric, who have developed extensive  
>>knowledge into how computers work, are very often brushed off very quickly.  
>>Dedric isn't even a jerk about, while I'm a jerk about it only sometimes,  
>>so I find that reaction to be, well, odd. But like I said, whatever gets  
>>ya through the day, I'm not looking for converts and nobody is paying me  
>>to post here.  
>>  
>>TCB

>>  
>>"LaMont" <jjdpro@ameritech.net> wrote:  
>>>  
>>>Thad, I assume that you are referring to me (using your ears).  
>>>  
>>>Look, I think we are talking about two different things here:  
>>>  
>>>1) Digital data  
>>>  
>>>2) Software (DAWS) coding  
>>>  
>>>You and Dedic have been concentrating on the laws of Digital audio.  
That's  
>>>fine. But, I'm talking about the Software that we use to decode our digital  
>>>audio.  
>>>  
>>>Like my previous post states, are we saying that DAW software can't be  
>written  
>>>for certain sonic results?  
>>>  
>>>  
>>>"TCB" <nobody@ishere.com> wrote:  
>>>>  
>>>>Neil,  
>>>>  
>>>>You're using an analog waveform that is leading you to think incorrectly  
>>>>about sampling. This is (very roughly) how it would look if you're working  
>>>>with 16 bit samples.  
>>>>  
>>>>0101010101010101  
>>>>0101010111011101  
>>>>0101110111010101  
>>>>0101111111010100  
>>>>0101110101111101  
>>>>0111011101111101  
>>>>0111110101110101  
>>>>0100010111000100  
>>>>0100011101010101  
>>>>0001011100010101  
>>>>0000010111111100  
>>>>0001000001010111  
>>>>0100000111110101  
>>>>0111011101010000  
>>>>0101011101000000  
>>>>0101011111000101  
>>>>0101010101010101  
>>>>  
>>>>The easiest way to think of how the sampler works is that it looks at



>the  
>>>>incoming voltage to the converter and asks 'Is this in the top or bottom  
>>>>half of the possible amplitudes I can measure.' If it's in the top half  
>>>it  
>>>>writes a 1, if it's in the bottom half, it writes a zero. The next bit  
>>asks,  
>>>>'Now that I know which half of my measurable voltage I'm looking at,  
is  
>>>the  
>>>>voltage in the top half of that half or the bottom half?' That's bit  
number  
>>>>two. Then it's on to, 'Now that I know what quarter it's it, is it in  
>the  
>>>>top or bottom half of that quarter?' And so on sixteen time giving it  
>a  
>>>resolution  
>>>>of 2 to the sixteenth power.  
>>>>  
>>>>In other words, asking if the bits under the sample would sound is like  
>>>asking  
>>>>how the road would drive if it were 30 feet underground.  
>>>>  
>>>>Now then, to get back to the original argument, people like me (and I  
>think  
>>>>Dedric but I'll let him speak for himself) get a little hacked off when  
>>>someone  
>>>>says, 'you have to use your ears' when it's possible using various computer  
>>>>tools to check exactly how many of those samples match in two given files.  
>>>>The nulling trick is just a very easy way to get a quick read on one  
aspect,  
>>>>which is to answer the question 'do these two files match?' But there  
>are  
>>>>others and I've used them. And the sameness between properly written  
(by  
>>>>which I mean lacking in serious bugs) audio applications is startling  
>and  
>>>>their differences so minor that other errors (analog cables, dust on  
the  
>>>>speaker cone, humidity and temperature in the room) are far more likely  
>>>to  
>>>>cause a difference.  
>>>>  
>>>>Personally I think this all stems from romanticism about music and the  
>>purity  
>>>>of art. I have yet to hear someone tell me they need financial calculations  
>>>>down to 25 decimal points. They need them done to (at most) five decimal  
>>>>points because the smallest commonly used financial divisor is the basis  
>>>>point, or one one hundredth of a penny. So internally you calculate to

>>five  
>>>>decimal places and round up or down from there and get on with your life.  
>>>>As geeky as finance guys can get, nobody ever says, 'You know, Thad,  
that  
>>>>last basis point just isn't really punchy enough for this deal. LBO guys  
>>>>need really punchy returns, so can you run that calculation out a few  
>more  
>>>>bits to get a punchier basis point?' Scientists are also extremely careful  
>>>>to keep 'false precision' out of their calculations, so if one instrument  
>>>>will measure to four decimal points and the others will measure to 12  
>they  
>>>>understand that everything the higher resolution instruments measure  
beyond  
>>>>four accurate decimal points is worthless. They usually won't even record  
>>>>the data to be sure they don't claim greater precision than they have,  
>>because  
>>>>that's considered a horribly embarrassing junior high school mistake.  
>But  
>>>>musicians and audio engineers think that just because the data is sound  
>>>>data  
>>>>somehow it enters a nebulous zone where that last one hundredth of a  
penny  
>>>>can be punchier. Hey, if it gets you through the day, that's fine by  
me,  
>>>>but there are things about digital audio that can be proven true or false  
>>>>using the data. For things that can't be proven true or false with the  
>>data  
>>>>itself there is ABY testing, which is a controlled way to use the most  
>>precise  
>>>>audio measuring instruments available (our ears, at least until bats  
will  
>>>>wear headphones) to see if things sound different. When it's not in the  
>>>>data,  
>>>>and it's not in the ABY, I say it doesn't exist.  
>>>>  
>>>>TCB  
>>>>  
>>>>"Neil" <IUOIU@OIU.com> wrote:  
>>>>>  
>>>>>Dedric - first of all, great explanation - esp. your 2nd  
>>>>>paragraph. Next, let's take a look at something in the form of  
>>>>>the best "graph" I can do in this NG's format... let's assume  
>>>>>that each dot in the simple graph below is a sample point on a  
>>>>>segment of a waveform, and let's futher assume that each "I"  
>>>>>below represents four bits (I don't want to make it too  
>>>>>vertically large, for ease of reading) - so we're dealing with  
>>>>>a 16-bit wav file, with the 5th "dot" from the start point on  
>>>>>the left being a full-amplitude, zero-db-line 16 bit sample.

>>>>  
>>>>Now.... really, all I have to do to get a "null" is to have the  
>>>>amplitude match at each "dot" on the waveform, yes? This, of  
>>>>course, is a very simplistic graphic example, so bear with  
>>>>me... but if I have each "dot" matching in amplitude &  
>>>>therefore can get a null, what about the bits & content thereof  
>>>>in between the extremes between the maxes & zero-line  
>>>>crossings? Are you saying that there can be no variables in  
>>>>sound between those sections that would still result in a null?  
>>>>What about all the "I"s that represent bits in between the  
>>>>maxes & the minimums?  
>>>>  
>>>>  
>>>> .  
>>>> . I .  
>>>> . III . What about the stuff in here?  
>>>> . IIIII . ....or in here????  
>>>> . IIIIIII .  
>>>>-----  
>>>> . IIIIIII .  
>>>> . IIIII . Again, what about this region?  
>>>> . III . ... or this region?  
>>>> . I .  
>>>> .  
>>>>  
>>>>Neil  
>>>>  
>>>  
>>  
>

Subject: Re: (No subject)  
Posted by [chuck duffy](#) on Fri, 22 Dec 2006 20:24:03 GMT  
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"TCB" <nobody@ishere.com> wrote:

"As geeky as finance guys can get, nobody ever says, 'You know, Thad, that last basis point just isn't really punchy enough for this deal. LBO guys need really punchy returns, so can you run that calculation out a few more bits to get a punchier basis point?'"

Don't be so sure. A long, long time ago I wrote some "summing" code for a general ledger. One of the outputs of the system was an income statement.

A long discussion ensued, amongst some very bright people, about where to do the rounding. There were many camps.

Were we to round the individual transactions within a GL number, and sum these?

Were we to sum the individual transactions unrounded, then round the total of the GL number?

Were we to sum the unrounded GL numbers associated with a specific income statement line, then round that total?

People are funny.

Chuck

---

Subject: Re: (No subject)  
Posted by [TCB](#) on Fri, 22 Dec 2006 21:18:13 GMT  
[View Forum Message](#) <> [Reply to Message](#)

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But were the totals warm and punchy? If so, then you did the summing right.

Seriously, though, it can matter when this kind of rounding takes place. A lot of times it's getting statements from custodial banks to match what's internal, and they might round differently than the logic of the internal database. And if you're running, say, \$19 billion plus those rounding errors can add up to more than the cost of a smoothie or two. Still, in contrast to audio people the finance types are interested in managing inevitable imprecision instead of finding precision where there really is none. At least usually they are . . .

TCB

"chuck duffy" <c@c.com> wrote:

>

>"TCB" <nobody@ishere.com> wrote:

>

>"As geeky as finance guys can get, nobody ever says, 'You know, Thad, that  
>last basis point just isn't really punchy enough for this deal. LBO guys  
>need really punchy returns, so can you run that calculation out a few more  
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>  
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>  
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>statement line, then round that total?  
>  
>People are funny.  
>  
>Chuck  
>  
>

---

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Subject: Re: (No subject)...What's up under the hood?  
Posted by [Dedric Terry](#) on Fri, 22 Dec 2006 21:57:20 GMT  
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Lamont - what is the output chain you are using for each app when comparing the file in Nuendo vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)? Since these can't use the same output driver, you would have to depend on the D/A being the same, but clocking will be different unless you have a master clock, and both interfaces are locking with the same accuracy. This was one of the issues that came up at Lynn Fuston's D/A converter shootout - when do you lock to external clock and incur the resulting jitter, and when do you trust the internal clock - and if you do lock externally, how good is the PLL in the slave device? These issues can cause audible changes in the top end that have nothing to do with the software itself. If you say that PTHD through the same converter output as Nuendo (via? RME? Lynx?) using the same master clock, sounds different playing a single audio file, then I take your word for it. I can't tell you why that is happening - only that an audible difference really shouldn't happen due to the software alone - not with a single audio file, esp. since I've heard and seen PTHD audio cancel with native DAWs. Just passing a single 16 or 24 bit track down the buss to the output driver should be, and usually is, completely transparent, bit for bit.

The same audio file played through the same converters should only sound different if something in the chain is different - be it clocking, gain or some degree of unintended, errant dsp processing. Every DAW should pass a single audio file without altering a single bit. That's a basic level of accuracy we should always expect of any DAW. If that accuracy isn't there, you can be sure a heavy mix will be altered in ways you didn't intend, even though you would end up mixing with that factor in place (e.g. you still mix for what you want to hear regardless of what the platform does to each audio track or channel).

In fact you should be able to send a stereo audio track out SPDIF or lightpipe to another DAW, record it bring the recorded file back in, line them up to the first bit, and have them cancel on and inverted phase test. I did this with Nuendo and Cubase 4 on separate machines just to be sure my master clocking and slave sync was accurate - it worked perfectly.

Also be sure there isn't a variation in the gain even by 0.1 dB between the two. There shouldn't and I wouldn't expect there to be one. Also could PT be set for a different pan law? Shouldn't make a difference even if comparing two mono panned files to their stereo interleaved equivalent, but for sake of completeness it's worth checking as well. A variation in the output chain, be it drivers, audio card card, or converters would be the most likely culprit here.

The reason DAW manufacturers wouldn't add any sonic "character" intentionally is that the ultimate goal from day one with recording has been to accurately reproduce what we hear. We developed a musical penchant for sonic character because the hardware just wasn't accurate, and what it did often sent us down new creative paths - even if by force - and we decided it was preferred that way.

Your point about what goes into the feature presets to sell synths is right for sure, but synths are about character and getting that "perfect piano" or crystal clear bell pad, or fat punchy bass without spending a mint on development, adding 50G onboard sample libraries, or costing \$15k, so what they lack in actual synthesis capabilities, they make up with EQ and effects on

the output. That's been the case for years, at least since we had effects on synths at least. But even with modern synths such as the Fantom, Tritons, etc, which are great synths all around, of course the coolest, widest and biggest patches will make the biggest impression - so in come the EQs, limiters, comps, reverbs, chorus, etc. The best way to find out if a synth is really good is to bypass all effects and see what happens. Most are pretty good these days, but about half the time, there are presets that fall completely flat in fx bypass.

DAWs aren't designed to put a sonic fingerprint on a sound the way synths are - they are designed to \*not\* add anything - to pass through what we create as users, with no alteration (or as little as possible) beyond what we add with intentional processing (EQ, comps, etc). Developers would find no pride in hearing that their DAW sounds anything different than whatever is being played back in it, and the concept is contrary to what AES and IEEE proceedings on the issue propose in general digital audio discussions, white papers, etc.

What ID ended up doing with Paris (at least from what I gather per Chuck's findings - so correct me if I'm missing part of the equation Chuck), is drop the track gain by 20dB or so, then added it back at the master buss to create the effect of headroom (probably because the master buss is really summing on the card, and they have more headroom there than on the tracks where native plugins might be used). I don't know if Paris passed 32-bit float files to the EDS card, but sort of doubt it. I think Chuck has clarified this at one point, but don't recall the answer.

Also what Paris did is use a greater bit depth on the hardware than ProTools did - at the time PT was just bring Mix+ systems to market, or they had been out for a year or two (if I have my timeline right) - they were 24-bit fixed all the way through. Logic and Cubase were native DAWs, but native was still too slow to compete with hardware hybrids. Paris trumped them all by running 32-bit float natively (not new really, but better than sticking to 24-bit) and 56 or so bits in hardware instead of going to Motorola DSPs at 24. The onboard effects were also a step up from anything out there, so the demo did sound good. I don't recall which, but one of the demos, imho, wasn't so good (some

sloppy production and vocals in spots, IIRC), so I only listened to it once. ;-)

Coupled with the gain drop and buss makeup, this all gave it a "headroom" no one else had. With very nice onboard effects, Paris jumped ahead of anything else out there easily, and still respectably holds its' own today in that department.

Most demos I hear (when I listen to them) vary in quality, usually not so great in some area. But if a demo does sound great, then it at least says that the product is capable of at least that level of performance, and it can only help improve a prospective buyer's impression of it.

Regards,  
Dedric

"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...

>  
> Dedric good post..  
>  
> However, I have PT-M-Powered/M-audio 410 interface for my laptop and it  
> has  
> that same sound (no eq, zero fader) that HD does. I know their use the  
> same  
> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
> fader)..results.  
> different sonic character.  
>  
> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm just  
> taking about a stereo wav file nulled with no eq..nothing ..zilch..nada..  
>  
> Now, there are devices (keyboards, dum machines) on the market today that  
> have a Master Buss Compressor and EQ set to on with the top end notched  
> up.  
> Why? because it gives their product an competitive advantageover the  
> competition..  
> Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>  
> So, why would'nt a DAW manufactuer code in an extra (oommf) to make their  
> DAW sound better. Especially, given the "I hate Digital Summing" crowd?  
> And,  
> If I'm a DAW manufactuer, what would give my product a sonic edge over the  
> competition?  
>  
> We live in the "louder is better" audio world these days, so a DAW that  
> can



> catch my attention 'sonically" will probaly will get the sell. That's what  
> happend to me back in 1997 when I heard Paris. I was floored!!! Still to  
> this day, nothing has floored me like that "Road House Blues Demo" I heard  
> on Paris.  
>  
> Was it the hardware ? was it the software. I remember talking with Edmund  
> at the 2000 winter Namm, and told me that he & Steve set out to reproduce  
> the sonics of big buck analog board (eq's) and all.. And, summing was a  
> big  
> big issue for them because they (ID) thought that nobody has gotten  
> it(summing)  
> right. And by right, they meant, behaved like a console with a wide lane  
> for all of those tracks..  
>  
>  
>  
>  
> "Dedric Terry" <dedric@echomg.com> wrote:  
>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458be8d5\$1@linux...  
>>>  
>>> Okay...  
>>> I guess what I'm saying is this:  
>>>  
>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>> differently  
>>> for sound results.  
>>  
>>Of course it is \*possible\* to do this, but only if the DAW has a specific  
>  
>>sound shaping purpose  
>>beyond normal summing/mixing. Users talk about wanting developers to add  
> a  
>>"Neve sound" or "API sound" option to summing engines,  
>>but that's really impractical given the amount of dsp required to make a  
>  
>>decent emulation (with convolution, dynamic EQ functions,  
>>etc). For sake of not eating up all cpu processing, that could likely  
>>only  
>  
>>surface as is a built in EQ, which  
>>no one wants universally in summing, and anyone can add at will already.  
>>  
>>So it hasn't happened yet and isn't likely to as it detours from the basic  
>  
>>tenant of audio recording - recreate what comes in as  
>>accurately as possible.  
>>  
>>What Digi did in recoding their summing engine was try to recover some

>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k dsps  
> are  
>>24-bit fixed point chips and I think  
>>the new generation (321?) still is, but they use double words now for  
>>48-bits). And though plugins could process at 48-bit by  
>>doubling up and using upper and lower 24-bit words for 48-bit outputs, the  
>  
>>buss  
>>between chips was 24-bits, so they had to dither to 24-bits after every  
>  
>>plugin. The mixer (if I recall correctly) also  
>>had a 24-bit buss, so what Digi did is to add a dither stage to the mixer  
> to  
>>prevent this  
>>constant truncation of data. 24-bits isn't enough to cover summing for  
> more  
>>than a few tracks without  
>>losing information in the 16-bit world, and in the 24-bit world some  
>>information will be lost, at least at the lowest levels.  
>>  
>>Adding a dither stage (though I think they did more than that - perhaps  
>  
>>implement a 48-bit double word stage as well),  
>>simply smoothed over the truncation that was happening, but it didn't  
>>solve  
>  
>>the problem, so with HD  
>>they went to a double-word path - throughout I believe, including the path  
>  
>>between chips. I believe the chips  
>>are still 24-bit, but by doubling up the processing (yes at a cost of  
>>twice  
>  
>>the overhead), they get a 48-bit engine.  
>>This not only provided better headroom, but greater resolution. Higher  
> bit  
>>depths subdivide the amplitude with greater resolution, and that's  
>>really where we get the definition of dynamic range - by lowering the  
>>signal  
>  
>>to quantization noise ratio.  
>>  
>>With DAWs that use 32-bit floating point math all the way through, the  
>>only  
>  
>>reason for altering the summing  
>>is by error, and that's an error that would actually be hard to make and  
> get

>>past a very basic alpha stage of testing.  
>>There is a small difference in fixed point math and floating point math,  
> or  
>>at least a theoretical difference in how it affects audio  
>>in certain cases, but not necessarily in the result for calculating gain  
> in  
>>either for the same audio file. Where any differences might show up is  
>  
>>complicated, and I believe only appear at levels below 24-bit (or in  
>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>there are any differences in where each amplitude level is quantized.  
>>  
>>Obviously there can be differences if the DAW has to use varying bit  
>>depths  
>  
>>throughout a single summing path to accommodate hardware  
>>as well as software summing, since there may be truncation or rounding  
>>along  
>  
>>the way, but that impacts the lowest bit  
>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>"depth",  
>  
>>not the levels most music so the differences are most  
>>often more subtle than not. But most modern DAWs have eliminated those  
>  
>>"rough edges" in the math by increasing the bit depth to accommodate normal  
>  
>>summing required for mixing audio.  
>>  
>>So with Lynn's unity gain summing test (A files on the CD I believe), DAWs  
>  
>>were never asked to sum beyond 24-bits,  
>>at least not on the upper end of the dynamic range, so everything that  
>>could  
>  
>>represent 24-bits accurately would cancel. The only ones  
>>that didn't were ones that had a different bit depth and/or gain structure  
>  
>>whether hybrid or native  
>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss). In  
>  
>>this case, PTHD cancelled (when I tested it) with  
>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed vs.  
>  
>>32-bit float wasn't a factor.  
>>  
>>When trying other tests, even when adding and subtracting gain, Nuendo,

>  
>>Sequoia and Sonar cancel - both audibly and  
>>visually at inaudible levels, which only proves that one isn't making an  
>  
>>error when calculating basic gain. Since a dB is well defined,  
>>and the math to add gain is simple, they shouldn't. The fact that they  
> all  
>>use 32-bit float all the way through eliminates a difference  
>>in data structure as well, and this just verifies that. There was a time  
>  
>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor went,  
>>but it's 32-bit float all the way through now just as Sonar,  
>>Nuendo/Cubase,  
>  
>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
> but  
>>I don't know if it is still 24-bit, or now 48 bit.  
>>That was an intentional choice by the developer, but he's the only one I  
>  
>>know of that stuck with 24-bit for summing  
>>intentionally, esp. after the Digi Mix system mixer incident.  
>>  
>>Long answer, but to sum up, it is certainly physically \*possible\* for a  
>  
>>developer to code something differently intentionally, but not  
>>in reality likely since it would be breaking some basic fixed point or  
>>floating point math rules. Where the differences really  
>>showed up in the past is with PT Mix systems where the limitation was  
>>really  
>  
>>significant - e.g. 24 bit with truncation at several stages.  
>>  
>>That really isn't such an issue anymore. Given the differences in  
>>workflow,  
>  
>>missing something in workflow or layout differences  
>>is easy enough to do (e.g. Sonar doesn't have group and busses the way  
>>Nuendo does, as it's outputs are actually driver outputs,  
>>not software busses, so in Sonar, busses are actually outputs, and sub  
>>busses are actually busses in Nuendo. There are no,  
>>or at least I haven't found the equivalent of a Nuendo group in Sonar -  
> that  
>>affects the results of some tests (though not basic  
>>summing) if not taken into account, but when taken into account, they work  
>  
>>exactly the same way).  
>>

>>So at least when talking about apps with 32-bit float all the way through,  
>  
>>it's safe to say (since it has been proven) that summing isn't different  
>  
>>unless  
>>there is an error somewhere, or variation in how the user duplicates the  
>  
>>same mix in two different apps.  
>>  
>>Imho, that's actually a very good thing - approaching a more consistent  
>  
>>basis for recording and mixing from which users can make all  
>>of the decisions as to how the final product will sound and not be  
>>required  
>  
>>to decide when purchasing a pricey console, and have to  
>>focus their business on clients who want "that sound". I believe we are  
>  
>>actually closer to the pure definition of recording now than  
>>we once were.  
>>  
>>Regards,  
>>Dedric  
>>  
>>  
>>> I the answer is yes, then,the real task is to discover or rather  
>>> un-cover  
>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>> Steinberg  
>>> and so on..  
>>>  
>>> What's under the hood. To me and others,when Digi re-coded their summing  
>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>  
>>> bump.  
>>> Where as Steinberg's summing is very neutral.  
>>>  
>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>Hi Neil,  
>>>>  
>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>through  
>>>>  
>>>>in a reasonable manner, but coming to the wrong  
>>>>conclusion - easy to do given how confusing digital audio can be. Each  
>>> word  
>>>>represents an amplitude

>>>>point on a single curve that is changing over time, and can vary with  
> a  
>>>  
>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>The complex harmonic content we hear is actually the frequency  
>>>>modulation  
>>> of  
>>>>a single waveform,  
>>>>that over a small amount of time creates the sound we translate - we  
>>>>don't  
>>>  
>>>>really hear a single sample at a time,  
>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>represent  
>>> a  
>>>>single positive or negative peak  
>>>>of a 22,050Hz waveform).  
>>>>  
>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
> 24,  
>>>  
>>>>you may hear, and will see that easily,  
>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>audible  
>>>  
>>>>the difference.  
>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>  
>>>>that  
>>>  
>>>>bit's impact will be  
>>>>if there is a variation.  
>>>>  
>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
> then  
>>>  
>>>>it simply be a  
>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>obvious  
>>>  
>>>>musical difference, but that should never  
>>>>happen in a phase cancellation test between identical files higher than  
>>> bit  
>>>>24, unless there are clock sync problems,  
>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>  
>>>>By definition of what DAWs do during playback and record, every audio  
>

>>>>stream  
>>>  
>>>>has the same point in time (judged by the timeline)  
>>>>played back sample accurately, one word at a time, at whatever sample  
>  
>>>>rate  
>>>  
>>>>we are using. A phase cancellation test uses that  
>>>>fact to compare two audio files word for word (and hence bit for bit  
>>>>since  
>>>  
>>>>each bit of a 24-bit word would  
>>>>be at the same bit slot in each 24-bit word). Assuming they are aligned  
>>> to  
>>>>the same start point, sample  
>>>>accurately, and both are the same set of sample words at each sample  
>>>>point,  
>>>  
>>>>bit for bit, and one is phase inverted,  
>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>completely  
>>>  
>>>>for the duration of the file, each and every bit in each word  
>>>>must be the exact opposite of that same bit position in a word at the  
> same  
>>>  
>>>>sample point. This is why zooming in on an FFT  
>>>>of the full difference file is valuable as it can show any differences  
> in  
>>>  
>>>>the lower order bits that wouldn't be audible. So even if  
>>>>there is no audible difference, the visual followup will show if the two  
>>>  
>>>>files truly cancel even a levels below hearing, or  
>>>>outside of a frequency change that we will perceive.  
>>>>  
>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>difference - it's usually one or more bits in the words for  
>>>>thousands of samples. From a musical standpoint this is usually in a  
>>>>frequency range (low freq, or high freq most often) - that will  
>>>>show up as the difference between them, and that usually happens due to  
>>> some  
>>>>form of processing difference between the files,  
>>>>such as EQ, compression, frequency dependant gain changes, etc. That is  
>>> what  
>>>>I believe you are thinking through, but when  
>>>>talking about straight summing with no gain change (or known equal gain  
>>>

>>>>changes), we are only looking at linear, one for one  
>>>>comparisons between the two files' frequency representations.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>> Neil wrote:  
>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>> The tests I did were completely blank down to -200 dB (far below the  
>>>>>>>  
>>>>>>> last  
>>>>>>>  
>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>> quantization noise, which by technical rights, is considered below  
> the  
>>>>>>>  
>>>>>>> level  
>>>>>>>  
>>>>>>> of "cancellation" in such tests.  
>>>>>>>  
>>>>>>> I'm not necessarily talking about just the first bit or the  
>>>>>>> last bit, but also everything in between... what happens on bit  
>>>>>>> #12, for example? Everything on bit #12 should be audible, but  
>>>>>>> in an a/b test what if there are differences in what bits #8  
>>>>>>> through #12 sound like, but the amplitude is still the same on  
>>>>>>> both files at that point, you'll get a null, right? Extrapolate  
>>>>>>> that out somewhat & let's say there are differences in bits #8  
>>>>>>> through #12 on sample points 3, 17, 1,000, 4,523, 7,560, etc,  
>>>>>>> etc through 43,972... Now this is breaking things down well  
>>>>>>> beyond what I think can be measured, if I'm not mistaken (I  
>>>>>>> don't know of any way we could extract JUST that information  
>>>>>>> from each file & play it back for an a/b test; but would not  
>>>>>>> that be enough to have to "null-able" files that do actually  
>>>>>>> sound somewhat different?  
>>>>>>>  
>>>>>>> I guess what I'm saying is that since each sample in a musical  
>>>>>>> track or full song file doesn't represent a pure, simple set of  
>>>>>>> content like a sample of a sine wave would - there's a whole  
>>>>>>> world of harmonic structure in each sample of a song file, and  
>>>>>>> I think (although I'll admit - I can't "prove") that there is  
>>>>>>> plenty of room for some variables between the first bit & the  
>>>>>>> last bit while still allowing for a null test to be successful.  
>>>>>>>  
>>>>>>> No? Am I wacked out of my mind?  
>>>>>>>  
>>>>>>> Neil  
>>>>>>>  
>>>>>>>  
>>>>>>>



>>>  
>>  
>>  
>

---

---

Subject: Re: (No subject)...What's up under the hood?  
Posted by [LaMont](#) on Sat, 23 Dec 2006 02:14:37 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Dedric, my simple test is simple..  
Using the same audio interface, with the same stereo file..null-ed to zero..No  
eq, for fx. Master fader on zero..

Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that I have  
referenced before.. The sound coming from PT-M has a nice top end , where  
as Neundo has a nice flatter sound quality.  
Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..

Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using the  
192 interface.  
Same results..But adding Logic audio's sound ..(Broad, thick)

Somethings going on.

Chucks post about how paris handles audio is a theory..Only Edmund can truly  
give us the goods on what's really what..

I disagree that manufactuers don;t set out o put a sonic print on their products.  
I think they do.

I have been fortunate to work on some digital mixers and I can tell you that  
each one has their own sound. The Sony Dmx-100 was modeled after SSL 4000g  
(like it's Big Brother).And you what? That board (Dmx-100) sound very warm  
and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
Dm2000(version 1.x) which has a very Clean, neutral sound..However, some  
complained that it was tooo Vanila and thus, Yamaha add a version 2.0 which  
added Vintage type Eq's, modeled analog input gain saturation fx too give  
the user a choice Btw Clean and Neutral vs sonic Character.

So, if digital conoles can be given a sonic character, why not a software  
mixer?

The truth is, there are some folks who want a neutral mixer and then there  
are others who want a sonic footprint imparted. and these can be coded in  
the digital realm.

The appllies with the manufactuers. They too have their vision on what They  
think and want their product to sound.

I love reading on gearslutz the posts from Plugin developers and their interpretations and opinions about what makes their Neve 1073 Eq better and what goes into making their version sound like it does.. Each Developer has a different vision as to what the Neve 1073 should sound like. And yet they all sound good , but slightly different.

You stated that you use Vegas. Well as you know, Vegas has a very generic sound..Just plain and simple. But, i bet you can tell the difference on your system when you play that same file in Nuendo (No, fx, eq, null-edzerro).. ???

"Dedric Terry" <dedric@echomg.com> wrote:

>Lamont - what is the output chain you are using for each app when comparing

>the file in Nuendo

>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?

>Since these can't use the same output driver, you would have to depend on

>the D/A being

>the same, but clocking will be different unless you have a master clock, and

>both interfaces

>are locking with the same accuracy. This was one of the issues that came up

>at Lynn Fuston's

>D/A converter shootout - when do you lock to external clock and incur the

>resulting jitter,

>and when do you trust the internal clock - and if you do lock externally,

>how good is the PLL

>in the slave device? These issues can cause audible changes in the top end

>that have nothing to do

>with the software itself. If you say that PTHD through the same converter

>output as Nuendo (via? RME?

>Lynx?) using the same master clock, sounds different playing a single audio

>file, then I take your word

>for it. I can't tell you why that is happening - only that an audible

>difference really shouldn't happen due

>to the software alone - not with a single audio file, esp. since I've heard

>and seen PTHD audio cancel with

>native DAWs. Just passing a single 16 or 24 bit track down the buss to the

>output driver should  
>be, and usually is, completely transparent, bit for bit.  
>  
>The same audio file played through the same converters should only sound  
  
>different if something in  
>the chain is different - be it clocking, gain or some degree of unintended,  
  
>errant dsp processing. Every DAW should  
>pass a single audio file without altering a single bit. That's a basic level  
  
>of accuracy we should always  
>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
  
>mix will be altered in ways you  
>didn't intend, even though you would end up mixing with that factor in place  
  
>(e.g. you still mix for what  
>you want to hear regardless of what the platform does to each audio track  
>or  
>channel).  
>  
>In fact you should be able to send a stereo audio track out SPDIF or  
>lightpipe to another DAW, record it  
>bring the recorded file back in, line them up to the first bit, and have  
  
>them cancel on and inverted phase  
>test. I did this with Nuendo and Cubase 4 on separate machines just to  
>be  
>sure my master clocking and  
>slave sync was accurate - it worked perfectly.  
>  
>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>the  
>two. There shouldn't  
>and I wouldn't expect there to be one. Also could PT be set for a different  
  
>pan law? Shouldn't make a  
>difference even if comparing two mono panned files to their stereo  
>interleaved equivalent, but for sake  
>of completeness it's worth checking as well. A variation in the output  
  
>chain, be it drivers, audio card  
>card, or converters would be the most likely culprit here.  
>  
>The reason DAW manufacturers wouldn't add any sonic "character"  
>intentionally is that the  
>ultimate goal from day one with recording has been to accurately reproduce

>what we hear.  
>We developed a musical penchant for sonic character because the hardware

>just wasn't accurate,  
>and what it did often sent us down new creative paths - even if by force  
-  
>and we decided it was  
>preferred that way.  
>  
>Your point about what goes into the feature presets to sell synths is right

>for sure, but synths are about  
>character and getting that "perfect piano" or crystal clear bell pad, or  
fat  
>punchy bass without spending  
>a mint on development, adding 50G onboard sample libraries, or costing \$15k,

>so what they  
>lack in actual synthesis capabilities, they make up with EQ and effects  
on  
>the output. That's been the case  
>for years, at least since we had effects on synths at least. But even with

>modern synths such as the Fantom,  
>Tritons, etc, which are great synths all around, of course the coolest,

>widest and biggest patches  
>will make the biggest impression - so in come the EQs, limiters, comps,

>reverbs, chorus, etc. The best  
>way to find out if a synth is really good is to bypass all effects and see

>what happens. Most are pretty  
>good these days, but about half the time, there are presets that fall  
>completely flat in fx bypass.  
>  
>DAWs aren't designed to put a sonic fingerprint on a sound the way synths

>are - they are designed  
>to \*not\* add anything - to pass through what we create as users, with no

>alteration (or as little as possible)  
>beyond what we add with intentional processing (EQ, comps, etc). Developers

>would find no pride  
>in hearing that their DAW sounds anything different than whatever is being

>played back in it,  
>and the concept is contrary to what AES and IEEE proceedings on the issue

>propose in general  
>digital audio discussions, white papers, etc.  
>  
>What ID ended up doing with Paris (at least from what I gather per Chuck's

>findings - so correct me if I'm missing part of the equation Chuck),  
>is drop the track gain by 20dB or so, then added it back at the master buss

>to create the effect of headroom (probably  
>because the master buss is really summing on the card, and they have more

>headroom there than on the tracks  
>where native plugins might be used). I don't know if Paris passed 32-bit

>float files to the EDS card, but sort of  
>doubt it. I think Chuck has clarified this at one point, but don't recall

>the answer.  
>  
>Also what Paris did is use a greater bit depth on the hardware than ProTools

>did - at the time PT was just  
>bring Mix+ systems to market, or they had been out for a year or two (if  
I  
>have my timeline right) - they  
>were 24-bit fixed all the way through. Logic and Cubase were native DAWs,

>but native was still too slow  
>to compete with hardware hybrids. Paris trumped them all by running 32-bit

>float natively (not new really, but  
>better than sticking to 24-bit) and 56 or so bits in hardware instead of

>going to Motorola DSPs at 24.  
>The onboard effects were also a step up from anything out there, so the  
demo  
>did sound good.  
>I don't recall which, but one of the demos, imho, wasn't so good (some  
>sloppy production and  
>vocals in spots, IIRC), so I only listened to it once. ;-)  
>  
>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
no  
>one else had. With very nice  
>onboard effects, Paris jumped ahead of anything else out there easily, and

>still respectably holds its' own today  
>in that department.  
>  
>Most demos I hear (when I listen to them) vary in quality, usually not so  
  
>great in some area. But if a demo does  
>sound great, then it at least says that the product is capable of at least  
  
>that level of performance, and it can  
>only help improve a prospective buyer's impression of it.  
>  
>Regards,  
>Dedric  
>  
>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>  
>> Dedric good post..  
>>  
>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and it  
  
>> has  
>> that same sound (no eq, zero fader) that HD does. I know their use the  
  
>> same  
>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>> fader)..results.  
>> different sonic character.  
>>  
>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm just  
>> taking about a stereo wav file nulled with no eq..nothing ..zilch..nada..  
>>  
>> Now, there are devices (keyboards, dum machines) on the market today that  
>> have a Master Buss Compressor and EQ set to on with the top end notched  
  
>> up.  
>> Why? because it gives their product an competitive advantageover the  
>> competition..  
>> Ex: Yamaha's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>  
>> So, why would'nt a DAW manufactuer code in an extra (oommf) to make their  
>> DAW sound better. Especially, given the "I hate Digital Summing" crowd?  
  
>> And,  
>> If I'm a DAW manufactuer, what would give my product a sonic edge over  
the  
>> competition?  
>>

>> We live in the "louder is better" audio world these days, so a DAW that

>> can

>> catch my attention 'sonically" will probaly will get the sell. That's what

>> happend to me back in 1997 when I heard Paris. I was floored!!! Still to

>> this day, nothing has floored me like that "Road House Blues Demo" I heard

>> on Paris.

>>

>> Was it the hardware ? was it the software. I remember talking with Edmund

>> at the 2000 winter Namm, and told me that he & Steve set out to reproduce

>> the sonics of big buck analog board (eq's) and all.. And, summing was a

>> big

>> big issue for them because they (ID) thought that nobody has gotten

>> it(summing)

>> right. And by right, they meant, behaved like a console with a wide lane

>> for all of those tracks..

>>

>>

>>

>>

>> "Dedric Terry" <dedric@echomg.com> wrote:

>>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458be8d5\$1@linux...

>>>>

>>>> Okay...

>>>> I guess what I'm saying is this:

>>>>

>>>> -Is it possible that diferent DAW manufactuers "code" their app

>>>> differently

>>>> for sound results.

>>>>

>>>>Of course it is \*possible\* to do this, but only if the DAW has a specific

>>>>

>>>>sound shaping purpose

>>>>beyond normal summing/mixing. Users talk about wanting developers to add

>> a

>>>"Neve sound" or "API sound" option to summing engines,

>>>but that's really impractical given the amount of dsp required to make a

>>

>>>decent emulation (with convolution, dynamic EQ functions,

>>>etc). For sake of not eating up all cpu processing, that could likely

>>>>only

>>

>>>surface as is a built in EQ, which  
>>>no one wants universally in summing, and anyone can add at will already.  
>>>  
>>>So it hasn't happened yet and isn't likely to as it detours from the basic  
>>  
>>>tenant of audio recording - recreate what comes in as  
>>>accurately as possible.  
>>>  
>>>What Digi did in recoding their summing engine was try to recover some  
>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k dsp  
>> are  
>>>24-bit fixed point chips and I think  
>>>the new generation (321?) still is, but they use double words now for  
>>>48-bits). And though plugins could process at 48-bit by  
>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
the  
>>  
>>>buss  
>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>  
>>>plugin. The mixer (if I recall correctly) also  
>>>had a 24-bit buss, so what Digi did is to add a dither stage to the mixer  
>> to  
>>>prevent this  
>>>constant truncation of data. 24-bits isn't enough to cover summing for  
>> more  
>>>than a few tracks without  
>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>information will be lost, at least at the lowest levels.  
>>>  
>>>Adding a dither stage (though I think they did more than that - perhaps  
>>  
>>>implement a 48-bit double word stage as well),  
>>>simply smoothed over the truncation that was happening, but it didn't  
  
>>>solve  
>>  
>>>the problem, so with HD  
>>>they went to a double-word path - throughout I believe, including the  
path  
>>  
>>>between chips. I believe the chips  
>>>are still 24-bit, but by doubling up the processing (yes at a cost of  
  
>>>twice  
>>  
>>>the overhead), they get a 48-bit engine.  
>>>This not only provided better headroom, but greater resolution. Higher



>> bit  
>>>depths subdivide the amplitude with greater resolution, and that's  
>>>really where we get the definition of dynamic range - by lowering the

>>>signal  
>>  
>>>to quantization noise ratio.  
>>>  
>>>With DAWs that use 32-bit floating point math all the way through, the

>>>only  
>>  
>>>reason for altering the summing  
>>>is by error, and that's an error that would actually be hard to make and  
>> get  
>>>past a very basic alpha stage of testing.  
>>>There is a small difference in fixed point math and floating point math,  
>> or  
>>>at least a theoretical difference in how it affects audio  
>>>in certain cases, but not necessarily in the result for calculating gain  
>> in  
>>>either for the same audio file. Where any differences might show up is  
>>  
>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>there are any differences in where each amplitude level is quantized.  
>>>  
>>>Obviously there can be differences if the DAW has to use varying bit  
>>>depths  
>>  
>>>throughout a single summing path to accommodate hardware  
>>>as well as software summing, since there may be truncation or rounding

>>>along  
>>  
>>>the way, but that impacts the lowest bit  
>>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>>"depth",  
>>  
>>>not the levels most music so the differences are most  
>>>often more subtle than not. But most modern DAWs have eliminated those  
>>  
>>>"rough edges" in the math by increasing the bit depth to accommodate normal  
>>  
>>>summing required for mixing audio.  
>>>  
>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
DAWs

>>  
>>>were never asked to sum beyond 24-bits,  
>>>at least not on the upper end of the dynamic range, so everything that  
  
>>>could  
>>  
>>>represent 24-bits accurately would cancel. The only ones  
>>>that didn't were ones that had a different bit depth and/or gain structure  
>>  
>>>whether hybrid or native  
>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
In  
>>  
>>>this case, PTHD cancelled (when I tested it) with  
>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
vs.  
>>  
>>>32-bit float wasn't a factor.  
>>>  
>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>  
>>>Sequoia and Sonar cancel - both audibly and  
>>>visually at inaudible levels, which only proves that one isn't making  
an  
>>  
>>>error when calculating basic gain. Since a dB is well defined,  
>>>and the math to add gain is simple, they shouldn't. The fact that they  
>> all  
>>>use 32-bit float all the way through eliminates a difference  
>>>in data structure as well, and this just verifies that. There was a time  
>>  
>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor went,  
>>>but it's 32-bit float all the way through now just as Sonar,  
>>>Nuendo/Cubase,  
>>  
>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>> but  
>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>That was an intentional choice by the developer, but he's the only one  
I  
>>  
>>>know of that stuck with 24-bit for summing  
>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>  
>>>Long answer, but to sum up, it is certainly physically \*possible\* for  
a  
>>

>>>developer to code something differently intentionally, but not  
>>>in reality likely since it would be breaking some basic fixed point or  
>>>floating point math rules. Where the differences really  
>>>showed up in the past is with PT Mix systems where the limitation was

>>>really  
>>  
>>>significant - e.g. 24 bit with truncation at several stages.  
>>>  
>>>That really isn't such an issue anymore. Given the differences in  
>>>workflow,  
>>  
>>>missing something in workflow or layout differences  
>>>is easy enough to do (e.g. Sonar doesn't have group and busses the way  
>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>not software busses, so in Sonar, busses are actually outputs, and sub  
>>>busses are actually busses in Nuendo. There are no,  
>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
-  
>> that  
>>>affects the results of some tests (though not basic  
>>>summing) if not taken into account, but when taken into account, they  
work  
>>  
>>>exactly the same way).  
>>>  
>>>So at least when talking about apps with 32-bit float all the way through,  
>>  
>>>it's safe to say (since it has been proven) that summing isn't different  
>>  
>>>unless  
>>>there is an error somewhere, or variation in how the user duplicates the  
>>  
>>>same mix in two different apps.  
>>>  
>>>Imho, that's actually a very good thing - approaching a more consistent  
>>  
>>>basis for recording and mixing from which users can make all  
>>>of the decisions as to how the final product will sound and not be  
>>>required  
>>  
>>>to decide when purchasing a pricey console, and have to  
>>>focus their business on clients who want "that sound". I believe we are  
>>  
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>>>we once were.  
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>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>modulation  
>>>> of  
>>>>>a single waveform,  
>>>>>that over a small amount of time creates the sound we translate - we  
  
>>>>>don't  
>>>>  
>>>>>really hear a single sample at a time,  
>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>represent  
>>>> a  
>>>>>single positive or negative peak  
>>>>>of a 22,050Hz waveform).  
>>>>>  
>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
>> 24,  
>>>>

>>>>you may hear, and will see that easily,  
>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>audible  
>>>>  
>>>>the difference.  
>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>  
>>>>that  
>>>>  
>>>>bit's impact will be  
>>>>if there is a variation.  
>>>>  
>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>> then  
>>>>  
>>>>it simply be a  
>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>obvious  
>>>>  
>>>>musical difference, but that should never  
>>>>happen in a phase cancellation test between identical files higher than  
>>>> bit  
>>>>24, unless there are clock sync problems,  
>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>  
>>>>By definition of what DAWs do during playback and record, every audio  
>>  
>>>>stream  
>>>>  
>>>>has the same point in time (judged by the timeline)  
>>>>played back sample accurately, one word at a time, at whatever sample  
>>  
>>>>rate  
>>>>  
>>>>we are using. A phase cancellation test uses that  
>>>>fact to compare two audio files word for word (and hence bit for bit  
  
>>>>since  
>>>>  
>>>>each bit of a 24-bit word would  
>>>>be at the same bit slot in each 24-bit word). Assuming they are aligned  
>>>> to  
>>>>the same start point, sample  
>>>>accurately, and both are the same set of sample words at each sample  
>>>>point,  
>>>>  
>>>>bit for bit, and one is phase inverted,  
>>>>they will cancel through all 24 bits. For two files to cancel

>>>>>completely  
>>>>  
>>>>>for the duration of the file, each and every bit in each word  
>>>>>must be the exact opposite of that same bit position in a word at the  
>> same  
>>>>  
>>>>>sample point. This is why zooming in on an FFT  
>>>>>of the full difference file is valuable as it can show any differences  
>> in  
>>>>  
>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>there is no audible difference, the visual followup will show if the  
two  
>>>>  
>>>>>files truly cancel even a levels below hearing, or  
>>>>>outside of a frequency change that we will perceive.  
>>>>>  
>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>difference - it's usually one or more bits in the words for  
>>>>>thousands of samples. From a musical standpoint this is usually in  
a  
>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>show up as the difference between them, and that usually happens due  
to  
>>>> some  
>>>>>form of processing difference between the files,  
>>>>>such as EQ, compression, frequency dependant gain changes, etc. That  
is  
>>>> what  
>>>>>I believe you are thinking through, but when  
>>>>>talking about straight summing with no gain change (or known equal gain  
>>>>  
>>>>>changes), we are only looking at linear, one for one  
>>>>>comparisons between the two files' frequency representations.  
>>>>>  
>>>>>Regards,  
>>>>>Dedric  
>>>>>  
>>>>>> Neil wrote:  
>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
the  
>>>>>  
>>>>>>>> last  
>>>>>>>>  
>>>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>>>> quantization noise, which by technical rights, is considered below  
>> the



I'll see if

I can round up an M-Powered system to compare with next month.

For reference, everytime I open Sequoia I think I might hear a broader, clean, and almost flat (spectrum, not depth) sound, but I don't - it's the same as Nuendo, fwiw.

Also I don't think what I was referring to was a theory from Chuck - I believe that was what he discovered in the code.

Digital mixers all have different preamps and converters. Unless you are bypassing every EQ and converter and going digital in and out to the same converter when comparing, it would be hard to say the mix engine itself sounds different than another mixer, but taken as a whole, then certainly they may very well sound different. In addition, hardware digital mixers may use a variety of different paths between the I/O, channel processing, and summing, though most are pretty much software mixers on a single chip or set of dsp's similar to ProTools, with I/O and a hardware surface attached.

I know it may be hard to separate the mix engine as software in either a native DAW or a digital mixer, from the hardware that translates the audio to something we hear, but that's what is required when comparing summing. The hardware can significantly change what we hear, so comparing digital mixers really isn't of as much interest as comparing native DAWs in that respect - unless you are looking to buy one of course.

Even though I know you think manufacturers are trying to add something to give them an edge, I am 100% sure that isn't the case - rather they are trying to add or change as little as possible in order to give them the edge. Their end of digital audio isn't about recreating the past, but improving upon it. As we've discussed and agreed before, the obsession with recreating "vintage" technology is as much fad as it is a valuable creative asset. There is no reason we shouldn't have far superior hardware and software EQs and comps than 20, 30 or 40 years ago. No reason at all, other than market demand, but the majority of software, and new hardware gear on the market has a vintage marketing tagline with it. Companies will sell any bill of



goods if customers will buy it.

There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp, or Sonar, and it's pretty safe to include Logic and DP in that list as well.

One of the reasons I test these things is to be sure my DAW isn't doing something wrong, or something I don't know about.

Vegas - I use it for video conversions and have never done any critical listening tests with it. What I have heard briefly didn't sound any different. It certainly looks plain vanilla though. What you are describing is exactly what I would say about the GUIs of each of those apps, not that it means anything. Just interesting.

That's one reason I listen eyes closed and double check with phase cancellation tests and FFTs - I am influenced creatively by the GUI to some degree. I actually like Cubase 4's GUI better than Nuendo 3.2, though there are only slight visual differences (some workflow differences are a definite improvement for me though).

ProTools' GUI always made me want to write one dimensional soundtracks in mono for public utilities, accounting offices or the IRS while reading my discreet systems analysis textbook - it was also grey. ;-)

Regards,  
Dedric

"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...

>  
> Dedric, my simple test is simple..  
> Using the same audio interface, with the same stereo file..null-ed to  
> zero..No  
> eq, for fx. Master fader on zero..  
>  
> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that I  
> have  
> referenced before.. The sound coming from PT-M has a nice top end , where  
> as Neundo has a nice flatter sound quality.  
> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>  
> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
> the  
> 192 interface.  
> Same results..But adding Logic audio's sound ..(Broad, thick)  
>

> Somethings going on.  
>  
> Chucks post about how paris handles audio is a theory..Only Edmund can  
> truly  
> give us the goods on what's really what..  
>  
> I disagree that manufactuers don;t set out o put a sonic print on their  
> products.  
> I think they do.  
>  
> I have been fortunate to work on some digital mixers and I can tell you  
> that  
> each one has their own sound. The Sony Dmx-100 was modeled after SSL 4000g  
> (like it's Big Brother).And you what? That board (Dmx-100) sound very warm  
> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
> Dm2000(version 1.x) which has a very Clean, neutral sound..However, some  
> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
> which  
> added Vintage type Eq's, modeled analog input gain saturation fx too give  
> the user a choice Btw Clean and Neutral vs sonic Character.  
>  
> So, if digital conoles can be given a sonic character, why not a software  
> mixer?  
> The truth is, there are some folks who want a neutral mixer and then there  
> are others who want a sonic footprint imparted. and these can be coded in  
> the digital realm.  
> The apllies with the manufactuers. They too have their vision on what They  
> think and want their product to sound.  
>  
> I love reading on gearslutz the posts from Plugin developers and their  
> interpretations  
> and opinions about what makes their Neve 1073 Eq better and what goes into  
> making their version sound like it does.. Each Developer has a different  
> vision as to what the Neve 1073 should sound like. And yet they all sound  
> good , but slightly different.  
>  
> You stated that you use Vegas. Well as you know, Vegas has a very generic  
> sound..Just plain and simple. But, i bet you can tell the difference on  
> your system when you play that same file in Neundo (No, fx, eq,  
> null-edzerro)..  
> ???  
>  
>  
> "Dedric Terry" <dedric@echomg.com> wrote:  
>>Lamont - what is the output chain you are using for each app when  
>>comparing  
>  
>>the file in Nuendo

>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?  
>>Since these can't use the same output driver, you would have to depend on  
>  
>>the D/A being  
>>the same, but clocking will be different unless you have a master clock,  
> and  
>>both interfaces  
>>are locking with the same accuracy. This was one of the issues that came  
> up  
>>at Lynn Fuston's  
>>D/A converter shootout - when do you lock to external clock and incur the  
>  
>>resulting jitter,  
>>and when do you trust the internal clock - and if you do lock externally,  
>  
>>how good is the PLL  
>>in the slave device? These issues can cause audible changes in the top  
> end  
>>that have nothing to do  
>>with the software itself. If you say that PTHD through the same converter  
>  
>>output as Nuendo (via? RME?  
>>Lynx?) using the same master clock, sounds different playing a single  
>>audio  
>  
>>file, then I take your word  
>>for it. I can't tell you why that is happening - only that an audible  
>>difference really shouldn't happen due  
>>to the software alone - not with a single audio file, esp. since I've  
>>heard  
>  
>>and seen PTHD audio cancel with  
>>native DAWs. Just passing a single 16 or 24 bit track down the buss to  
> the  
>>output driver should  
>>be, and usually is, completely transparent, bit for bit.  
>>  
>>The same audio file played through the same converters should only sound  
>  
>>different if something in  
>>the chain is different - be it clocking, gain or some degree of  
>>unintended,  
>  
>>errant dsp processing. Every DAW should  
>>pass a single audio file without altering a single bit. That's a basic  
>>level  
>  
>>of accuracy we should always

>>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
>  
>>mix will be altered in ways you  
>>didn't intend, even though you would end up mixing with that factor in  
>>place  
>  
>>(e.g. you still mix for what  
>>you want to hear regardless of what the platform does to each audio track  
> or  
>>channel).  
>>  
>>In fact you should be able to send a stereo audio track out SPDIF or  
>>lightpipe to another DAW, record it  
>>bring the recorded file back in, line them up to the first bit, and have  
>  
>>them cancel on and inverted phase  
>>test. I did this with Nuendo and Cubase 4 on separate machines just to  
> be  
>>sure my master clocking and  
>>slave sync was accurate - it worked perfectly.  
>>  
>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
> the  
>>two. There shouldn't  
>>and I wouldn't expect there to be one. Also could PT be set for a  
>>different  
>  
>>pan law? Shouldn't make a  
>>difference even if comparing two mono panned files to their stereo  
>>interleaved equivalent, but for sake  
>>of completeness it's worth checking as well. A variation in the output  
>  
>>chain, be it drivers, audio card  
>>card, or converters would be the most likely culprit here.  
>>  
>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>intentionally is that the  
>>ultimate goal from day one with recording has been to accurately reproduce  
>  
>>what we hear.  
>>We developed a musical penchant for sonic character because the hardware  
>  
>>just wasn't accurate,  
>>and what it did often sent us down new creative paths - even if by force  
> -  
>>and we decided it was  
>>preferred that way.  
>>

>>Your point about what goes into the feature presets to sell synths is  
>>right  
>  
>>for sure, but synths are about  
>>character and getting that "perfect piano" or crystal clear bell pad, or  
> fat  
>>punchy bass without spending  
>>a mint on development, adding 50G onboard sample libraries, or costing  
>>\$15k,  
>  
>>so what they  
>>lack in actual synthesis capabilities, they make up with EQ and effects  
> on  
>>the output. That's been the case  
>>for years, at least since we had effects on synths at least. But even  
>>with  
>  
>>modern synths such as the Fantom,  
>>Tritons, etc, which are great synths all around, of course the coolest,  
>  
>>widest and biggest patches  
>>will make the biggest impression - so in come the EQs, limiters, comps,  
>  
>>reverbs, chorus, etc. The best  
>>way to find out if a synth is really good is to bypass all effects and see  
>  
>>what happens. Most are pretty  
>>good these days, but about half the time, there are presets that fall  
>>completely flat in fx bypass.  
>>  
>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>  
>>are - they are designed  
>>to \*not\* add anything - to pass through what we create as users, with no  
>  
>>alteration (or as little as possible)  
>>beyond what we add with intentional processing (EQ, comps, etc).  
>>Developers  
>  
>>would find no pride  
>>in hearing that their DAW sounds anything different than whatever is being  
>  
>>played back in it,  
>>and the concept is contrary to what AES and IEEE proceedings on the issue  
>  
>>propose in general  
>>digital audio discussions, white papers, etc.  
>>

>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>  
>>findings - so correct me if I'm missing part of the equation Chuck),  
>>is drop the track gain by 20dB or so, then added it back at the master  
>>buss  
>  
>>to create the effect of headroom (probably  
>>because the master buss is really summing on the card, and they have more  
>  
>>headroom there than on the tracks  
>>where native plugins might be used). I don't know if Paris passed 32-bit  
>  
>>float files to the EDS card, but sort of  
>>doubt it. I think Chuck has clarified this at one point, but don't recall  
>  
>>the answer.  
>>  
>>Also what Paris did is use a greater bit depth on the hardware than  
>>ProTools  
>  
>>did - at the time PT was just  
>>bring Mix+ systems to market, or they had been out for a year or two (if  
> I  
>>have my timeline right) - they  
>>were 24-bit fixed all the way through. Logic and Cubase were native DAWs,  
>  
>>but native was still too slow  
>>to compete with hardware hybrids. Paris trumped them all by running  
>>32-bit  
>  
>>float natively (not new really, but  
>>better than sticking to 24-bit) and 56 or so bits in hardware instead of  
>  
>>going to Motorola DSPs at 24.  
>>The onboard effects were also a step up from anything out there, so the  
> demo  
>>did sound good.  
>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>sloppy production and  
>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>  
>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
> no  
>>one else had. With very nice  
>>onboard effects, Paris jumped ahead of anything else out there easily, and  
>  
>>still respectably holds its' own today  
>>in that department.

>>  
>>Most demos I hear (when I listen to them) vary in quality, usually not so  
>  
>>great in some area. But if a demo does  
>>sound great, then it at least says that the product is capable of at  
>>least  
>  
>>that level of performance, and it can  
>>only help improve a prospective buyer's impression of it.  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>  
>>> Dedric good post..  
>>>  
>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and it  
>  
>>> has  
>>> that same sound (no eq, zero fader) that HD does. I know their use the  
>  
>>> same  
>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>> fader)..results.  
>>> different sonic character.  
>>>  
>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm just  
>>> taking about a stereo wav file nulled with no eq..nothing  
>>> ..zilch..nada..  
>>>  
>>> Now, there are devices (keyboards, dum machines) on the market today  
>>> that  
>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>  
>>> up.  
>>> Why? because it gives their product an competitive advantageover the  
>>> competition..  
>>> Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>  
>>> So, why would'nt a DAW manufactuer code in an extra (ooommf) to make  
>>> their  
>>> DAW sound better. Especially, given the "I hate Digital Summing" crowd?  
>  
>>> And,  
>>> If I'm a DAW manufactuer, what would give my product a sonic edge over  
> the  
>>> competition?

>>>  
>>> We live in the "louder is better" audio world these days, so a DAW that  
>  
>>> can  
>>> catch my attention 'sonically" will probaly will get the sell. That's  
> what  
>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
> to  
>>> this day, nothing has floored me like that "Road House Blues Demo" I  
>>> heard  
>>> on Paris.  
>>>  
>>> Was it the hardware ? was it the software. I remember talking with  
>>> Edmund  
>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>> reproduce  
>>> the sonics of big buck analog board (eq's) and all.. And, summing was  
> a  
>>> big  
>>> big issue for them because they (ID) thought that nobody has gotten  
>>> it(summing)  
>>> right. And by right, they meant, behaved like a console with a wide lane  
>>> for all of those tracks..  
>>>  
>>>  
>>>  
>>>  
>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>news:458be8d5\$1@linux...  
>>>>>  
>>>>> Okay...  
>>>>> I guess what I'm saying is this:  
>>>>>  
>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>> differently  
>>>>> for sound results.  
>>>>>  
>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>specific  
>>>>>  
>>>>>sound shaping purpose  
>>>>>beyond normal summing/mixing. Users talk about wanting developers to  
> add  
>>> a  
>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>but that's really impractical given the amount of dsp required to make  
> a



>>>  
>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>etc). For sake of not eating up all cpu processing, that could likely  
>  
>>>>only  
>>>  
>>>>surface as is a built in EQ, which  
>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>  
>>>>So it hasn't happened yet and isn't likely to as it detours from the  
>>>>basic  
>>>  
>>>>tenant of audio recording - recreate what comes in as  
>>>>accurately as possible.  
>>>>  
>>>>What Digi did in recoding their summing engine was try to recover some  
>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k dsps  
>>> are  
>>>>24-bit fixed point chips and I think  
>>>>the new generation (321?) still is, but they use double words now for  
>>>>48-bits). And though plugins could process at 48-bit by  
>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
> the  
>>>  
>>>>buss  
>>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>>  
>>>>plugin. The mixer (if I recall correctly) also  
>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
>>>>mixer  
>>> to  
>>>>prevent this  
>>>>constant truncation of data. 24-bits isn't enough to cover summing for  
>>> more  
>>>>than a few tracks without  
>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>information will be lost, at least at the lowest levels.  
>>>>  
>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>  
>>>>implement a 48-bit double word stage as well),  
>>>>simply smoothed over the truncation that was happening, but it didn't  
>  
>>>>solve  
>>>  
>>>>the problem, so with HD  
>>>>they went to a double-word path - throughout I believe, including the  
> path

>>>  
>>>>between chips. I believe the chips  
>>>>are still 24-bit, but by doubling up the processing (yes at a cost of  
>  
>>>>twice  
>>>  
>>>>the overhead), they get a 48-bit engine.  
>>>>This not only provided better headroom, but greater resolution. Higher  
>>> bit  
>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>really where we get the definition of dynamic range - by lowering the  
>  
>>>>signal  
>>>  
>>>>to quantization noise ratio.  
>>>>  
>>>>With DAWs that use 32-bit floating point math all the way through, the  
>  
>>>>only  
>>>  
>>>>reason for altering the summing  
>>>>is by error, and that's an error that would actually be hard to make and  
>>> get  
>>>>past a very basic alpha stage of testing.  
>>>>There is a small difference in fixed point math and floating point math,  
>>> or  
>>>>at least a theoretical difference in how it affects audio  
>>>>in certain cases, but not necessarily in the result for calculating gain  
>>> in  
>>>>either for the same audio file. Where any differences might show up is  
>>>  
>>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>there are any differences in where each amplitude level is quantized.  
>>>>  
>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>depths  
>>>  
>>>>throughout a single summing path to accomodate hardware  
>>>>as well as software summing, since there may be truncation or rounding  
>  
>>>>along  
>>>  
>>>>the way, but that impacts the lowest bit  
>>>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>>>"depth",  
>>>  
>>>>not the levels most music so the differences are most

>>>>often more subtle than not. But most modern DAWs have eliminated those  
>>>  
>>>>"rough edges" in the math by increasing the bit depth to accomodate  
>>>>normal  
>>>  
>>>>summing required for mixing audio.  
>>>>  
>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
> DAWs  
>>>  
>>>>were never asked to sum beyond 24-bits,  
>>>>at least not on the upper end of the dynamic range, so everything that  
>  
>>>>could  
>>>  
>>>>represent 24-bits accurately would cancel. The only ones  
>>>>that didn't were ones that had a different bit depth and/or gain  
>>>>structure  
>>>  
>>>>whether hybrid or native  
>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
> In  
>>>  
>>>>this case, PTHD cancelled (when I tested it) with  
>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
> vs.  
>>>  
>>>>32-bit float wasn't a factor.  
>>>>  
>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>  
>>>>Sequoia and Sonar cancel - both audibly and  
>>>>visually at inaudible levels, which only proves that one isn't making  
> an  
>>>  
>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>and the math to add gain is simple, they shouldn't. The fact that they  
>>> all  
>>>>use 32-bit float all the way through eliminates a difference  
>>>>in data structure as well, and this just verifies that. There was a  
>>>>time  
>>>  
>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor went,  
>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>Nuendo/Cubase,  
>>>  
>>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,

>>> but  
>>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>>That was an intentional choice by the developer, but he's the only one  
> I  
>>>  
>>>>know of that stuck with 24-bit for summing  
>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>  
>>>>Long answer, but to sum up, it is certainly physically \*possible\* for  
> a  
>>>  
>>>>developer to code something differently intentionally, but not  
>>>>in reality likely since it would be breaking some basic fixed point or  
>>>>floating point math rules. Where the differences really  
>>>>showed up in the past is with PT Mix systems where the limitation was  
>  
>>>>really  
>>>  
>>>>significant - e.g. 24 bit with truncation at several stages.  
>>>>  
>>>>That really isn't such an issue anymore. Given the differences in  
>>>>workflow,  
>>>  
>>>>missing something in workflow or layout differences  
>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the way  
>>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>>not software busses, so in Sonar, busses are actually outputs, and sub  
>>>>busses are actually busses in Nuendo. There are no,  
>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
> -  
>>> that  
>>>>affects the results of some tests (though not basic  
>>>>summing) if not taken into account, but when taken into account, they  
> work  
>>>  
>>>>exactly the same way).  
>>>>  
>>>>So at least when talking about apps with 32-bit float all the way  
>>>>through,  
>>>  
>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>  
>>>>unless  
>>>>there is an error somewhere, or variation in how the user duplicates the  
>>>  
>>>>same mix in two different apps.  
>>>>  
>>>>Imho, that's actually a very good thing - approaching a more consistent

>>>  
>>>>basis for recording and mixing from which users can make all  
>>>>of the decisions as to how the final product will sound and not be  
>>>>required  
>>>  
>>>>to decide when purchasing a pricey console, and have to  
>>>>focus their business on clients who want "that sound". I believe we are  
>>>  
>>>>actually closer to the pure definition of recording now than  
>>>>we once were.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>  
>>>>>  
>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>> un-cover  
>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>> Steinberg  
>>>>> and so on..  
>>>>>  
>>>>> What's under the hood. To me and others,when Digi re-coded their  
>>>>> summing  
>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>  
>>>>> bump.  
>>>>> Where as Steinberg's summing is very neutral.  
>>>>>  
>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>Hi Neil,  
>>>>>>  
>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>through  
>>>>>>  
>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>conclusion - easy to do given how confusing digital audio can be.  
>>>>>>Each  
>>>>>>word  
>>>>>>represents an amplitude  
>>>>>>point on a single curve that is changing over time, and can vary with  
>>> a  
>>>>>  
>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>modulation  
>>>>> of  
>>>>>>a single waveform,

>>>>>that over a small amount of time creates the sound we translate - we  
>  
>>>>>don't  
>>>>>  
>>>>>really hear a single sample at a time,  
>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>represent  
>>>>> a  
>>>>>single positive or negative peak  
>>>>>of a 22,050Hz waveform).  
>>>>>  
>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
>>> 24,  
>>>>>  
>>>>>you may hear, and will see that easily,  
>>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>>audible  
>>>>>  
>>>>>the difference.  
>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>>  
>>>>>that  
>>>>>  
>>>>>bit's impact will be  
>>>>>if there is a variation.  
>>>>>  
>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>>> then  
>>>>>  
>>>>>it simply be a  
>>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>>obvious  
>>>>>  
>>>>>musical difference, but that should never  
>>>>>happen in a phase cancellation test between identical files higher  
>>>>>than  
>>>>> bit  
>>>>>24, unless there are clock sync problems,  
>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>  
>>>>>By definition of what DAWs do during playback and record, every audio  
>>>  
>>>>>stream  
>>>>>  
>>>>>has the same point in time (judged by the timeline)  
>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>  
>>>>>rate

>>>>>  
>>>>>we are using. A phase cancellation test uses that  
>>>>>fact to compare two audio files word for word (and hence bit for bit  
>  
>>>>>since  
>>>>>  
>>>>>each bit of a 24-bit word would  
>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
>>>>>aligned  
>>>>> to  
>>>>>the same start point, sample  
>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>point,  
>>>>>  
>>>>>bit for bit, and one is phase inverted,  
>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>completely  
>>>>>  
>>>>>for the duration of the file, each and every bit in each word  
>>>>>must be the exact opposite of that same bit position in a word at the  
>>> same  
>>>>>  
>>>>>sample point. This is why zooming in on an FFT  
>>>>>of the full difference file is valuable as it can show any differences  
>>> in  
>>>>>  
>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>there is no audible difference, the visual followup will show if the  
> two  
>>>>>  
>>>>>files truly cancel even a levels below hearing, or  
>>>>>outside of a frequency change that we will perceive.  
>>>>>  
>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>difference - it's usually one or more bits in the words for  
>>>>>thousands of samples. From a musical standpoint this is usually in  
> a  
>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>show up as the difference between them, and that usually happens due  
> to  
>>>>> some  
>>>>>form of processing difference between the files,  
>>>>>such as EQ, compression, frequency dependant gain changes, etc. That  
> is  
>>>>> what  
>>>>>I believe you are thinking through, but when  
>>>>>talking about straight summing with no gain change (or known equal  
>>>>>gain





>>>>>>>  
>>>>>  
>>>>>  
>>>>  
>>>>  
>>>>  
>>>  
>>  
>>  
>

---

---

Subject: Re: (No subject)...What's up inder the hood?  
Posted by [LaMont](#) on Sat, 23 Dec 2006 07:39:57 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Dedric, check out this post from our dear friend Fredo: Neundo Moderator:  
Explaining how Steingberg's audio engine works. Note the trade-offs..Meaning,  
Steinberg's way of coding an audio-engine 32bit float is different than say  
Magix Samplitude:

Fredo  
Administrative Moderator

Joined: 29 Dec 2004  
Posts: 4213  
Location: Belgium  
Posted: Fri Dec 08, 2006 2:33 pm Post subject:

-----  
I think I see where the problem is.  
In my scenario's I don't have any track that goes over 0dBfs, but I have  
always lowered one channel to compensate with another.  
So, I never went over the 0dB fs limit.

Here's the explanation:

As soon as you go over 0dB, technically you are entering the domain of distortion.

In a 32bit FP mixer, that is not the case since there is unlimited headroom.

Now follow me step by step please - read this slow and make sure you understand  
-

At the end of each "stage", there is an adder (a big calculator) which adds  
all the numbers from the individual tracks that are routed to this "adder".

The numbers are kept in the 80-bit registers and then brought back to 32bit float.

This process of bringing back the numbers from 80-bit (and more) to 32bit is kept to an absolute minimum.

This adding/bringing back to 32bit is done at 3 places: After a plugin slot (VST-specs for all plugin manufacturers) - Group Tracks and Master Tracks.

Now, as soon as you boost the volume above 0dB, you get more than 32bits. Stay below 0dB and you will stay below 32 bits.

When the adders dump their results, the numbers are brought back from any number of bits (say 60bit) to 32 bit float.

These numbers are simply truncated which results in distortion; that's the noise/residue you find way down low.

There is an algorithm that protects us from additive errors - so these errors can never come into the audible range.

So, as soon as you go over 0dB, you will see these kind of artifacts.

It is debatable if this needs to be dithered or not. The problem -still is- that it is very difficult to dither in a Floating Point environment.

Fact remains that the error shouldn't be bigger than 2 to 3 LSB's.

Is this a problem?

In real world applications: NO.

In scientific -unrealistic- tests (forcing the error): YES.

The alternative is having a Fixed point mixer, where you already would be in trouble as soon as you boost one channel over 0dBfs. (or merge two files that are @ 0dB)

Also, this problem will be pretty much gone as soon as we switch to the 64 bit engine.

For the record, the test where Jake hears "music" as residue must be flawed. You should hear noise/distortion from square waves.

HTH

Fredo

"Dedric Terry" <dedric@echomg.com> wrote:

>I can't tell you why you hear ProTools differently than Nuendo using a  
>single file.

>There isn't any voodoo in the software, or hidden character enhancing dsp.

>I'll see if

>I can round up an M-Powered system to compare with next month.

>

>For reference, everytime I open Sequoia I think I might hear a broader,

>clean,

>and almost flat (spectrum, not depth) sound, but I don't - it's the same as

>Nuendo, fwiw.

>Also I don't think what I was referring to was a theory from Chuck - I

>believe that was what he

>discovered in the code.

>

>Digital mixers all have different preamps and converters. Unless you are

>bypassing every

>EQ and converter and going digital in and out to the same converter when

>comparing, it would be hard

>to say the mix engine itself sounds different than another mixer, but taken

>as a whole, then

>certainly they may very well sound different. In addition, hardware digital

>mixers may use a variety of different paths between the I/O, channel

>processing, and summing,

>though most are pretty much software mixers on a single chip or set of dsps

>similar to ProTools,

>with I/O and a hardware surface attached.

>

>I know it may be hard to separate the mix engine as software in either a

>native DAW

>or a digital mixer, from the hardware that translates the audio to something

>we hear,

>but that's what is required when comparing summing. The hardware can

>significantly change

>what we hear, so comparing digital mixers really isn't of as much interest

>as comparing native

>DAWs in that respect - unless you are looking to buy one of course.

>

>Even though I know you think manufacturers are trying to add something to

>give them an edge, I am 100%  
>sure that isn't the case - rather they are trying to add or change as little

>as possible in order to give  
>them the edge. Their end of digital audio isn't about recreating the past,

>but improving upon it.  
>As we've discussed and agreed before, the obsession with recreating  
>"vintage" technology is as much  
>fad as it is a valuable creative asset. There is no reason we shouldn't

>have far superior hardware and software EQs and comps  
>than 20, 30 or 40 years ago. No reason at all, other than market demand,

>but the majority of software, and new  
>hardware gear on the market has a vintage marketing tagline with it.  
>Companies will sell any bill of  
>goods if customers will buy it.  
>  
>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>or Sonar, and it's pretty safe to include Logic and DP in that list as well.

>One of the reasons I test  
>these things is to be sure my DAW isn't doing something wrong, or something

>I don't know about.  
>  
>Vegas - I use it for video conversions and have never done any critical

>listening tests with it. What I have heard  
>briefly didn't sound any different. It certainly looks plain vanilla  
>though. What you are describing is exactly  
>what I would say about the GUIs of each of those apps, not that it means

>anything. Just interesting.  
>  
>That's one reason I listen eyes closed and double check with phase  
>cancellation tests and FFTs - I am  
>influenced creatively by the GUI to some degree. I actually like Cubase  
>4's  
>GUI better than Nuendo 3.2,  
>though there are only slight visual differences (some workflow differences

>are a definite improvement for me though).  
>  
>ProTools' GUI always made me want to write one dimensional soundtracks in  
>mono for public utilities, accounting offices

>or the IRS while reading my discreet systems analysis textbook - it was also  
>grey. ;-)  
>  
>Regards,  
>Dedric  
>  
>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>  
>> Dedric, my simple test is simple..  
>> Using the same audio interface, with the same stereo file..null-ed to  
  
>> zero..No  
>> eq, for fx. Master fader on zero..  
>>  
>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that  
I  
>> have  
>> referenced before.. The sound coming from PT-M has a nice top end , where  
>> as Neundo has a nice flatter sound quality.  
>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>  
>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
  
>> the  
>> 192 interface.  
>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>  
>> Somethings going on.  
>>  
>> Chucks post about how paris handles audio is a theory..Only Edmund can  
  
>> truly  
>> give us the goods on what's really what..  
>>  
>> I disagree that manufactuers don;t set out o put a sonic print on their  
  
>> products.  
>> I think they do.  
>>  
>> I have been fortunate to work on some digital mixers and I can tell you  
  
>> that  
>> each one has their own sound. The Sony Dmx-100 was modeled after SSL 4000g  
>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
warm  
>> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
>> Dm2000(version 1.x) which has a very Clean, neutral sound..However, some

>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0

>> which

>> added Vintage type Eq's, modeled analog input gain saturation fx too give

>> the user a choice Btw Clean and Neutral vs sonic Character.

>>

>> So, if digital conoles can be given a sonic character, why not a software

>> mixer?

>> The truth is, there are some folks who want a neutral mixer and then there

>> are others who want a sonic footprint imparted. and these can be coded

in

>> the digital realm.

>> The appllies with the manufactuers. They too have their vision on what

They

>> think and want their product to sound.

>>

>> I love reading on gearslutz the posts from Plugin developers and their

>> interpretations

>> and opinions about what makes their Neve 1073 Eq better and what goes into

>> making their version sound like it does.. Each Developer has a different

>> vision as to what the Neve 1073 should sound like. And yet they all sound

>> good , but slightly different.

>>

>> You stated that you use Vegas. Well as you know, Vegas has a very generic

>> sound..Just plain and simple. But, i bet you can tell the difference

on

>> your system when you play that same file in Nuendo (No, fx, eq,

>> null-edzerro)..

>> ???

>>

>>

>> "Dedric Terry" <dedric@echomg.com> wrote:

>>>Lamont - what is the output chain you are using for each app when

>>>comparing

>>

>>>the file in Nuendo

>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?

>>>Since these can't use the same output driver, you would have to depend

on

>>

>>>the D/A being

>>>the same, but clocking will be different unless you have a master clock,

>> and

>>>both interfaces

>>>are locking with the same accuracy. This was one of the issues that came

>> up

>>>at Lynn Fuston's  
>>>D/A converter shootout - when do you lock to external clock and incur  
the  
>>  
>>>resulting jitter,  
>>>and when do you trust the internal clock - and if you do lock externally,  
>>  
>>>how good is the PLL  
>>>in the slave device? These issues can cause audible changes in the top  
>> end  
>>>that have nothing to do  
>>>with the software itself. If you say that PTHD through the same converter  
>>  
>>>output as Nuendo (via? RME?  
>>>Lynx?) using the same master clock, sounds different playing a single  
  
>>>audio  
>>  
>>>file, then I take your word  
>>>for it. I can't tell you why that is happening - only that an audible  
>>>difference really shouldn't happen due  
>>>to the software alone - not with a single audio file, esp. since I've  
  
>>>heard  
>>  
>>>and seen PTHD audio cancel with  
>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
to  
>> the  
>>>output driver should  
>>>be, and usually is, completely transparent, bit for bit.  
>>>  
>>>The same audio file played through the same converters should only sound  
>>  
>>>different if something in  
>>>the chain is different - be it clocking, gain or some degree of  
>>>unintended,  
>>  
>>>errant dsp processing. Every DAW should  
>>>pass a single audio file without altering a single bit. That's a basic  
  
>>>level  
>>  
>>>of accuracy we should always  
>>>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
>>  
>>>mix will be altered in ways you  
>>>didn't intend, even though you would end up mixing with that factor in

>>>place  
>>  
>>>(e.g. you still mix for what  
>>>you want to hear regardless of what the platform does to each audio track  
>> or  
>>>channel).  
>>>  
>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>lightpipe to another DAW, record it  
>>>bring the recorded file back in, line them up to the first bit, and have  
>>  
>>>them cancel on and inverted phase  
>>>test. I did this with Nuendo and Cubase 4 on separate machines just to  
>> be  
>>>sure my master clocking and  
>>>slave sync was accurate - it worked perfectly.  
>>>  
>>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>> the  
>>>two. There shouldn't  
>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>different  
>>  
>>>pan law? Shouldn't make a  
>>>difference even if comparing two mono panned files to their stereo  
>>>interleaved equivalent, but for sake  
>>>of completeness it's worth checking as well. A variation in the output  
>>  
>>>chain, be it drivers, audio card  
>>>card, or converters would be the most likely culprit here.  
>>>  
>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>intentionally is that the  
>>>ultimate goal from day one with recording has been to accurately reproduce  
>>  
>>>what we hear.  
>>>We developed a musical penchant for sonic character because the hardware  
>>  
>>>just wasn't accurate,  
>>>and what it did often sent us down new creative paths - even if by force  
>> -  
>>>and we decided it was  
>>>preferred that way.  
>>>  
>>>Your point about what goes into the feature presets to sell synths is  
  
>>>right



>>  
>>>for sure, but synths are about  
>>>character and getting that "perfect piano" or crystal clear bell pad,  
or  
>> fat  
>>>punchy bass without spending  
>>>a mint on development, adding 50G onboard sample libraries, or costing  
  
>>>\$15k,  
>>  
>>>so what they  
>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>> on  
>>>the output. That's been the case  
>>>for years, at least since we had effects on synths at least. But even  
  
>>>with  
>>  
>>>modern synths such as the Fantom,  
>>>Tritons, etc, which are great synths all around, of course the coolest,  
>>  
>>>widest and biggest patches  
>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>  
>>>reverbs, chorus, etc. The best  
>>>way to find out if a synth is really good is to bypass all effects and  
see  
>>  
>>>what happens. Most are pretty  
>>>good these days, but about half the time, there are presets that fall  
>>>completely flat in fx bypass.  
>>>  
>>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>>  
>>>are - they are designed  
>>>to \*not\* add anything - to pass through what we create as users, with  
no  
>>  
>>>alteration (or as little as possible)  
>>>beyond what we add with intentional processing (EQ, comps, etc).  
>>>Developers  
>>  
>>>would find no pride  
>>>in hearing that their DAW sounds anything different than whatever is being  
>>  
>>>played back in it,  
>>>and the concept is contrary to what AES and IEEE proceedings on the issue  
>>

>>>propose in general  
>>>digital audio discussions, white papers, etc.  
>>>  
>>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>>  
>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>is drop the track gain by 20dB or so, then added it back at the master

>>>buss  
>>  
>>>to create the effect of headroom (probably  
>>>because the master buss is really summing on the card, and they have more  
>>  
>>>headroom there than on the tracks  
>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>  
>>>float files to the EDS card, but sort of  
>>>doubt it. I think Chuck has clarified this at one point, but don't recall  
>>  
>>>the answer.  
>>>  
>>>Also what Paris did is use a greater bit depth on the hardware than  
>>>ProTools  
>>  
>>>did - at the time PT was just  
>>>bring Mix+ systems to market, or they had been out for a year or two (if  
>> I  
>>>have my timeline right) - they  
>>>were 24-bit fixed all the way through. Logic and Cubase were native DAWs,  
>>  
>>>but native was still too slow  
>>>to compete with hardware hybrids. Paris trumped them all by running  
>>>32-bit  
>>  
>>>float natively (not new really, but  
>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
of  
>>  
>>>going to Motorola DSPs at 24.  
>>>The onboard effects were also a step up from anything out there, so the  
>> demo  
>>>did sound good.  
>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>sloppy production and  
>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>  
>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>> no

>>>one else had. With very nice  
>>>onboard effects, Paris jumped ahead of anything else out there easily,  
and  
>>  
>>>still respectably holds its' own today  
>>>in that department.  
>>>  
>>>Most demos I hear (when I listen to them) vary in quality, usually not  
so  
>>  
>>>great in some area. But if a demo does  
>>>sound great, then it at least says that the product is capable of at  
  
>>>least  
>>  
>>>that level of performance, and it can  
>>>only help improve a prospective buyer's impression of it.  
>>>  
>>>Regards,  
>>>Dedric  
>>>  
>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>  
>>>> Dedric good post..  
>>>>  
>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and  
it  
>>  
>>>> has  
>>>> that same sound (no eq, zero fader) that HD does. I know their use the  
>>  
>>>> same  
>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>> fader)..results.  
>>>> different sonic character.  
>>>>  
>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm  
just  
>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>> ..zilch..nada..  
>>>>  
>>>> Now, there are devices (keyboards, dum machines) on the market today  
  
>>>> that  
>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>  
>>>> up.  
>>>> Why? because it gives their product an competitive advantageover the

>>>> competition..  
>>>> Ex: Yamaha's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>  
>>>> So, why would'nt a DAW manufactuer code in an extra (ooommf) to make  
  
>>>> their  
>>>> DAW sound better. Especially, given the "I hate Digital Summing" crowd?  
>>  
>>>> And,  
>>>> If I'm a DAW manufactuer, what would give my product a sonic edge over  
>> the  
>>>> competition?  
>>>>  
>>>> We live in the "louder is better" audio world these days, so a DAW that  
>>  
>>>> can  
>>>> catch my attention 'sonically" will probaly will get the sell. That's  
>> what  
>>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
>> to  
>>>> this day, nothing has floored me like that "Road House Blues Demo" I  
  
>>>> heard  
>>>> on Paris.  
>>>>  
>>>> Was it the hardware ? was it the software. I remember talking with  
>>>> Edmund  
>>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>>> reproduce  
>>>> the sonics of big buck analog board (eq's) and all.. And, summing was  
>> a  
>>>> big  
>>>> big issue for them because they (ID) thought that nobody has gotten  
>>>> it(summing)  
>>>> right. And by right, they meant, behaved like a console with a wide  
lane  
>>>> for all of those tracks..  
>>>>  
>>>>  
>>>>  
>>>>  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>>news:458be8d5\$1 @linux...  
>>>>>>  
>>>>>> Okay...  
>>>>>> I guess what I'm saying is this:  
>>>>>>

>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>> differently  
>>>>> for sound results.  
>>>>>  
>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>specific  
>>>>>  
>>>>>sound shaping purpose  
>>>>>beyond normal summing/mixing. Users talk about wanting developers to  
>> add  
>>>> a  
>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>but that's really impractical given the amount of dsp required to make  
>> a  
>>>>>  
>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>etc). For sake of not eating up all cpu processing, that could likely  
>>  
>>>>>only  
>>>>>  
>>>>>surface as is a built in EQ, which  
>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>  
>>>>>So it hasn't happened yet and isn't likely to as it detours from the  
  
>>>>>basic  
>>>>>  
>>>>>tenant of audio recording - recreate what comes in as  
>>>>>accurately as possible.  
>>>>>  
>>>>>What Digi did in recoding their summing engine was try to recover some  
>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k dsps  
>>>>> are  
>>>>>24-bit fixed point chips and I think  
>>>>>the new generation (321?) still is, but they use double words now for  
>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>> the  
>>>>>  
>>>>>buss  
>>>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>>>>  
>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
  
>>>>>mixer  
>>>>> to  
>>>>>prevent this

>>>>constant truncation of data. 24-bits isn't enough to cover summing  
for  
>>>> more  
>>>>than a few tracks without  
>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>information will be lost, at least at the lowest levels.  
>>>>  
>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>  
>>>>implement a 48-bit double word stage as well),  
>>>>simply smoothed over the truncation that was happening, but it didn't  
>>  
>>>>solve  
>>>>  
>>>>the problem, so with HD  
>>>>they went to a double-word path - throughout I believe, including the  
>> path  
>>>>  
>>>>between chips. I believe the chips  
>>>>are still 24-bit, but by doubling up the processing (yes at a cost of  
>>  
>>>>twice  
>>>>  
>>>>the overhead), they get a 48-bit engine.  
>>>>This not only provided better headroom, but greater resolution. Higher  
>>>> bit  
>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>really where we get the definition of dynamic range - by lowering the  
>>  
>>>>signal  
>>>>  
>>>>to quantization noise ratio.  
>>>>  
>>>>With DAWs that use 32-bit floating point math all the way through, the  
>>  
>>>>only  
>>>>  
>>>>reason for altering the summing  
>>>>is by error, and that's an error that would actually be hard to make  
and  
>>>> get  
>>>>past a very basic alpha stage of testing.  
>>>>There is a small difference in fixed point math and floating point math,  
>>>> or  
>>>>at least a theoretical difference in how it affects audio  
>>>>in certain cases, but not necessarily in the result for calculating  
gain  
>>>> in

>>>>either for the same audio file. Where any differences might show up  
is  
>>>>  
>>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>there are any differences in where each amplitude level is quantized.  
>>>>  
>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>depths  
>>>>  
>>>>throughout a single summing path to accommodate hardware  
>>>>as well as software summing, since there may be truncation or rounding  
>>  
>>>>along  
>>>>  
>>>>the way, but that impacts the lowest bit  
>>>>level, and hence - spatial reproduction, reverb tails perhaps, and  
>>>>"depth",  
>>>>  
>>>>not the levels most music so the differences are most  
>>>>often more subtle than not. But most modern DAWs have eliminated those  
>>>>  
>>>>"rough edges" in the math by increasing the bit depth to accommodate  
  
>>>>normal  
>>>>  
>>>>summing required for mixing audio.  
>>>>  
>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
>> DAWs  
>>>>  
>>>>were never asked to sum beyond 24-bits,  
>>>>at least not on the upper end of the dynamic range, so everything that  
>>  
>>>>could  
>>>>  
>>>>represent 24-bits accurately would cancel. The only ones  
>>>>that didn't were ones that had a different bit depth and/or gain  
>>>>structure  
>>>>  
>>>>whether hybrid or native  
>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>> In  
>>>>  
>>>>this case, PTHD cancelled (when I tested it) with  
>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>> vs.  
>>>>

>>>>32-bit float wasn't a factor.  
>>>>  
>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>  
>>>>Sequoia and Sonar cancel - both audibly and  
>>>>visually at inaudible levels, which only proves that one isn't making  
>> an  
>>>>  
>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>and the math to add gain is simple, they shouldn't. The fact that they  
>>>> all  
>>>>use 32-bit float all the way through eliminates a difference  
>>>>in data structure as well, and this just verifies that. There was a  
  
>>>>time  
>>>>  
>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor went,  
>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>Nuendo/Cubase,  
>>>>  
>>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>> but  
>>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>>That was an intentional choice by the developer, but he's the only one  
>> I  
>>>>  
>>>>know of that stuck with 24-bit for summing  
>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>  
>>>>Long answer, but to sum up, it is certainly physically \*possible\* for  
>> a  
>>>>  
>>>>developer to code something differently intentionally, but not  
>>>>in reality likely since it would be breaking some basic fixed point  
>> or  
>>>>floating point math rules. Where the differences really  
>>>>showed up in the past is with PT Mix systems where the limitation was  
>>  
>>>>really  
>>>>  
>>>>significant - e.g. 24 bit with truncation at several stages.  
>>>>  
>>>>That really isn't such an issue anymore. Given the differences in  
>>>>workflow,  
>>>>  
>>>>missing something in workflow or layout differences  
>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the way



>>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>>not software busses, so in Sonar, busses are actually outputs, and sub  
>>>>busses are actually busses in Nuendo. There are no,  
>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
>> -  
>>>> that  
>>>>affects the results of some tests (though not basic  
>>>>summing) if not taken into account, but when taken into account, they  
>> work  
>>>>  
>>>>exactly the same way).  
>>>>  
>>>>So at least when talking about apps with 32-bit float all the way  
>>>>through,  
>>>>  
>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>>  
>>>>unless  
>>>>there is an error somewhere, or variation in how the user duplicates  
the  
>>>>  
>>>>same mix in two different apps.  
>>>>  
>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>  
>>>>basis for recording and mixing from which users can make all  
>>>>of the decisions as to how the final product will sound and not be  
>>>>required  
>>>>  
>>>>to decide when purchasing a pricey console, and have to  
>>>>focus their business on clients who want "that sound". I believe we  
are  
>>>>  
>>>>actually closer to the pure definition of recording now than  
>>>>we once were.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>  
>>>>  
>>>>>  
>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>> un-cover  
>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>> Steinberg  
>>>>> and so on..  
>>>>>  
>>>>> What's under the hood. To me and others,when Digi re-coded their

>>>>> summing  
>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>  
>>>>> bump.  
>>>>> Where as Steinberg's summing is very neutral.  
>>>>>  
>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>Hi Neil,  
>>>>>>  
>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>through  
>>>>>>  
>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>conclusion - easy to do given how confusing digital audio can be.

>>>>>>Each  
>>>>>> word  
>>>>>>represents an amplitude  
>>>>>>point on a single curve that is changing over time, and can vary with  
>>>>>> a  
>>>>>>  
>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>modulation  
>>>>>> of  
>>>>>>a single waveform,  
>>>>>>that over a small amount of time creates the sound we translate -  
we  
>>  
>>>>>>don't  
>>>>>>  
>>>>>>really hear a single sample at a time,  
>>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>>represent  
>>>>>> a  
>>>>>>single positive or negative peak  
>>>>>>of a 22,050Hz waveform).  
>>>>>>  
>>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
>>>> 24,  
>>>>>>  
>>>>>>you may hear, and will see that easily,  
>>>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>>>audible  
>>>>>>  
>>>>>>the difference.  
>>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>>>

>>>>>>that  
>>>>>>  
>>>>>>bit's impact will be  
>>>>>>if there is a variation.  
>>>>>>  
>>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>>>> then  
>>>>>>  
>>>>>>it simply be a  
>>>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>>>obvious  
>>>>>>  
>>>>>>musical difference, but that should never  
>>>>>>happen in a phase cancellation test between identical files higher  
  
>>>>>>than  
>>>>>> bit  
>>>>>>24, unless there are clock sync problems,  
>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>  
>>>>>>By definition of what DAWs do during playback and record, every audio  
>>>>>>  
>>>>>>stream  
>>>>>>  
>>>>>>has the same point in time (judged by the timeline)  
>>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>>>>  
>>>>>>rate  
>>>>>>  
>>>>>>we are using. A phase cancellation test uses that  
>>>>>>fact to compare two audio files word for word (and hence bit for bit  
>>  
>>>>>>since  
>>>>>>  
>>>>>>each bit of a 24-bit word would  
>>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
>>>>>>aligned  
>>>>>> to  
>>>>>>the same start point, sample  
>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>point,  
>>>>>>  
>>>>>>bit for bit, and one is phase inverted,  
>>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>>completely  
>>>>>>  
>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>must be the exact opposite of that same bit position in a word at

the  
>>>> same  
>>>>>  
>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>of the full difference file is valuable as it can show any differences  
>>>> in  
>>>>>  
>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>there is no audible difference, the visual followup will show if the  
>> two  
>>>>>>  
>>>>>>files truly cancel even a levels below hearing, or  
>>>>>>outside of a frequency change that we will perceive.  
>>>>>>  
>>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>thousands of samples. From a musical standpoint this is usually in  
>> a  
>>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>>show up as the difference between them, and that usually happens due  
>> to  
>>>>>> some  
>>>>>>form of processing difference between the files,  
>>>>>>such as EQ, compression, frequency dependant gain changes, etc. That  
>> is  
>>>>>> what  
>>>>>>I believe you are thinking through, but when  
>>>>>>talking about straight summing with no gain change (or known equal  
  
>>>>>>gain  
>>>>>>  
>>>>>>changes), we are only looking at linear, one for one  
>>>>>>comparisons between the two files' frequency representations.  
>>>>>>  
>>>>>>Regards,  
>>>>>>Dedric  
>>>>>>  
>>>>>>> Neil wrote:  
>>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
>> the  
>>>>>>>  
>>>>>>>>> last  
>>>>>>>>>  
>>>>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>>>>>> quantization noise, which by technical rights, is considered below  
>>>> the  
>>>>>>>>>>>



>  
>That's too bad. I think people have an instinctive thing against the sound  
>of Live as well, just because it also loops like ACID does. Live sounds  
like  
>a properly written native DAW when working with non time stretched tracks.  
>The sound quality on the stretched audio is amazing, all things considered,  
>but the non-stretched sound is indistinguishable from SX. Too bad the only  
>really truly awful sounding app has to bring down a perfectly nice sounding  
>one.  
>  
>TCB

I'm a recent convert to Live 6 after testing its audio engine. I had also  
been under the impression it would affect the quality of my mixdowns but  
am happy to see that's not the case. Great program although I still use SX3  
for some midi editing recording.

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Subject: Re: (No subject)...What's up under the hood?  
Posted by [chuck duffy](#) on Sat, 23 Dec 2006 15:58:01 GMT  
[View Forum Message](#) <> [Reply to Message](#)

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Hi Lamont,

I've posted this several times in the past, but here's the scoop. Edmund  
did not write the summing code. It's deep within the DSP code running on  
the ESP2 chips. It was written by some very talented guys at Ensoniq. I  
really dig everything that Edmund and Stephen did, but the summing just isn't  
part of it.

The stuff I posted is not really a theory. The PARIS mix engine source code  
is freely available for download. Anyone with a little time, patience and  
the ESP2 patent can clearly see what is going on. It's only a couple hundred  
lines of code.

Chuck

"Dedric Terry" <[dedric@echomg.com](mailto:dedric@echomg.com)> wrote:

>I can't tell you why you hear ProTools differently than Nuendo using a  
>single file.  
>There isn't any voodoo in the software, or hidden character enhancing dsp.  
  
>I'll see if  
>I can round up an M-Powered system to compare with next month.  
>  
>For reference, everytime I open Sequoia I think I might hear a broader,

>clean,  
>and almost flat (spectrum, not depth) sound, but I don't - it's the same  
as  
>Nuendo, fwiw.  
>Also I don't think what I was referring to was a theory from Chuck - I  
  
>believe that was what he  
>discovered in the code.  
>  
>Digital mixers all have different preamps and converters. Unless you are  
  
>bypassing every  
>EQ and converter and going digital in and out to the same converter when  
  
>comparing, it would be hard  
>to say the mix engine itself sounds different than another mixer, but taken  
  
>as a whole, then  
>certainly they may very well sound different. In addition, hardware digital  
>mixers may use a variety of different paths between the I/O, channel  
>processing, and summing,  
>though most are pretty much software mixers on a single chip or set of dsps  
  
>similar to ProTools,  
>with I/O and a hardware surface attached.  
>  
>I know it may be hard to separate the mix engine as software in either a  
  
>native DAW  
>or a digital mixer, from the hardware that translates the audio to something  
  
>we hear,  
>but that's what is required when comparing summing. The hardware can  
>significantly change  
>what we hear, so comparing digital mixers really isn't of as much interest  
  
>as comparing native  
>DAWs in that respect - unless you are looking to buy one of course.  
>  
>Even though I know you think manufacturers are trying to add something to  
  
>give them an edge, I am 100%  
>sure that isn't the case - rather they are trying to add or change as little  
  
>as possible in order to give  
>them the edge. Their end of digital audio isn't about recreating the past,  
  
>but improving upon it.

>As we've discussed and agreed before, the obsession with recreating  
>"vintage" technology is as much  
>fad as it is a valuable creative asset. There is no reason we shouldn't

>have far superior hardware and software EQs and comps  
>than 20, 30 or 40 years ago. No reason at all, other than market demand,

>but the majority of software, and new  
>hardware gear on the market has a vintage marketing tagline with it.  
>Companies will sell any bill of  
>goods if customers will buy it.

>  
>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>or Sonar, and it's pretty safe to include Logic and DP in that list as well.

>One of the reasons I test  
>these things is to be sure my DAW isn't doing something wrong, or something

>I don't know about.

>  
>Vegas - I use it for video conversions and have never done any critical

>listening tests with it. What I have heard  
>briefly didn't sound any different. It certainly looks plain vanilla  
>though. What you are describing is exactly  
>what I would say about the GUIs of each of those apps, not that it means

>anything. Just interesting.

>  
>That's one reason I listen eyes closed and double check with phase  
>cancellation tests and FFTs - I am  
>influenced creatively by the GUI to some degree. I actually like Cubase  
4's  
>GUI better than Nuendo 3.2,  
>though there are only slight visual differences (some workflow differences

>are a definite improvement for me though).

>  
>ProTools' GUI always made me want to write one dimensional soundtracks in

>mono for public utilities, accounting offices  
>or the IRS while reading my discreet systems analysis textbook - it was  
also  
>grey. ;-)

>  
>Regards,  
>Dedric  
>



>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>  
>> Dedic, my simple test is simple..  
>> Using the same audio interface, with the same stereo file..null-ed to  
  
>> zero..No  
>> eq, for fx. Master fader on zero..  
>>  
>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that  
I  
>> have  
>> referenced before.. The sound coming from PT-M has a nice top end , where  
>> as Neundo has a nice flatter sound quality.  
>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>  
>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
  
>> the  
>> 192 interface.  
>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>  
>> Somethings going on.  
>>  
>> Chucks post about how paris handles audio is a theory..Only Edmund can  
  
>> truly  
>> give us the goods on what's really what..  
>>  
>> I disagree that manufactuers don;t set out o put a sonic print on their  
  
>> products.  
>> I think they do.  
>>  
>> I have been fortunate to work on some digital mixers and I can tell you  
  
>> that  
>> each one has their own sound. The Sony Dmx-100 was modeled after SSL 4000g  
>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
warm  
>> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
>> Dm2000(version 1.x) which has a very Clean, neutral sound..However, some  
>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
  
>> which  
>> added Vintage type Eq's, modeled analog input gain saturation fx too give  
>> the user a choice Btw Clean and Neutral vs sonic Character.  
>>  
>> So, if digital conoles can be given a sonic character, why not a software

>> mixer?  
>> The truth is, there are some folks who want a neutral mixer and then there  
>> are others who want a sonic footprint imparted. and these can be coded  
in  
>> the digital realm.  
>> The applies with the manufactuers. They too have their vision on what  
They  
>> think and want their product to sound.  
>>  
>> I love reading on gearslutz the posts from Plugin developers and their  
  
>> interpretations  
>> and opinions about what makes their Neve 1073 Eq better and what goes  
into  
>> making their version sound like it does.. Each Developer has a different  
>> vision as to what the Neve 1073 should sound like. And yet they all sound  
>> good , but slightly different.  
>>  
>> You stated that you use Vegas. Well as you know, Vegas has a very generic  
>> sound..Just plain and simple. But, i bet you can tell the difference  
on  
>> your system when you play that same file in Neundo (No, fx, eq,  
>> null-edzerro)..  
>> ???  
>>  
>>  
>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>Lamont - what is the output chain you are using for each app when  
>>>comparing  
>>  
>>>the file in Nuendo  
>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?  
>>>Since these can't use the same output driver, you would have to depend  
on  
>>  
>>>the D/A being  
>>>the same, but clocking will be different unless you have a master clock,  
>> and  
>>>both interfaces  
>>>are locking with the same accuracy. This was one of the issues that came  
>> up  
>>>at Lynn Fuston's  
>>>D/A converter shootout - when do you lock to external clock and incur  
the  
>>  
>>>resulting jitter,  
>>>and when do you trust the internal clock - and if you do lock externally,  
>>

>>>how good is the PLL  
>>>in the slave device? These issues can cause audible changes in the top  
>> end  
>>>that have nothing to do  
>>>with the software itself. If you say that PTHD through the same converter  
>>  
>>>output as Nuendo (via? RME?  
>>>Lynx?) using the same master clock, sounds different playing a single  
  
>>>audio  
>>  
>>>file, then I take your word  
>>>for it. I can't tell you why that is happening - only that an audible  
>>>difference really shouldn't happen due  
>>>to the software alone - not with a single audio file, esp. since I've  
  
>>>heard  
>>  
>>>and seen PTHD audio cancel with  
>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
to  
>> the  
>>>output driver should  
>>>be, and usually is, completely transparent, bit for bit.  
>>>  
>>>The same audio file played through the same converters should only sound  
>>  
>>>different if something in  
>>>the chain is different - be it clocking, gain or some degree of  
>>>unintended,  
>>  
>>>errant dsp processing. Every DAW should  
>>>pass a single audio file without altering a single bit. That's a basic  
  
>>>level  
>>  
>>>of accuracy we should always  
>>>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
>>  
>>>mix will be altered in ways you  
>>>didn't intend, even though you would end up mixing with that factor in  
  
>>>place  
>>  
>>>(e.g. you still mix for what  
>>>you want to hear regardless of what the platform does to each audio track  
>> or  
>>>channel).

>>>  
>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>lightpipe to another DAW, record it  
>>>bring the recorded file back in, line them up to the first bit, and have  
>>  
>>>them cancel on and inverted phase  
>>>test. I did this with Nuendo and Cubase 4 on separate machines just to  
>> be  
>>>sure my master clocking and  
>>>slave sync was accurate - it worked perfectly.  
>>>  
>>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>> the  
>>>two. There shouldn't  
>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>different  
>>  
>>>pan law? Shouldn't make a  
>>>difference even if comparing two mono panned files to their stereo  
>>>interleaved equivalent, but for sake  
>>>of completeness it's worth checking as well. A variation in the output  
>>  
>>>chain, be it drivers, audio card  
>>>card, or converters would be the most likely culprit here.  
>>>  
>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>intentionally is that the  
>>>ultimate goal from day one with recording has been to accurately reproduce  
>>  
>>>what we hear.  
>>>We developed a musical penchant for sonic character because the hardware  
>>  
>>>just wasn't accurate,  
>>>and what it did often sent us down new creative paths - even if by force  
>> -  
>>>and we decided it was  
>>>preferred that way.  
>>>  
>>>Your point about what goes into the feature presets to sell synths is  
  
>>>right  
>>  
>>>for sure, but synths are about  
>>>character and getting that "perfect piano" or crystal clear bell pad,  
or  
>> fat  
>>>punchy bass without spending  
>>>a mint on development, adding 50G onboard sample libraries, or costing

>>>\$15k,  
>>  
>>>so what they  
>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>> on  
>>>the output. That's been the case  
>>>for years, at least since we had effects on synths at least. But even  
  
>>>with  
>>  
>>>modern synths such as the Fantom,  
>>>Tritons, etc, which are great synths all around, of course the coolest,  
>>  
>>>widest and biggest patches  
>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>  
>>>reverbs, chorus, etc. The best  
>>>way to find out if a synth is really good is to bypass all effects and  
see  
>>  
>>>what happens. Most are pretty  
>>>good these days, but about half the time, there are presets that fall  
>>>completely flat in fx bypass.  
>>>  
>>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>>  
>>>are - they are designed  
>>>to \*not\* add anything - to pass through what we create as users, with  
no  
>>  
>>>alteration (or as little as possible)  
>>>beyond what we add with intentional processing (EQ, comps, etc).  
>>>Developers  
>>  
>>>would find no pride  
>>>in hearing that their DAW sounds anything different than whatever is being  
>>  
>>>played back in it,  
>>>and the concept is contrary to what AES and IEEE proceedings on the issue  
>>  
>>>propose in general  
>>>digital audio discussions, white papers, etc.  
>>>  
>>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>>  
>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>is drop the track gain by 20dB or so, then added it back at the master

>>>buss  
>>  
>>>to create the effect of headroom (probably  
>>>because the master buss is really summing on the card, and they have more  
>>  
>>>headroom there than on the tracks  
>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>  
>>>float files to the EDS card, but sort of  
>>>doubt it. I think Chuck has clarified this at one point, but don't recall  
>>  
>>>the answer.  
>>>  
>>>Also what Paris did is use a greater bit depth on the hardware than  
>>>ProTools  
>>  
>>>did - at the time PT was just  
>>>bring Mix+ systems to market, or they had been out for a year or two (if  
>> I  
>>>have my timeline right) - they  
>>>were 24-bit fixed all the way through. Logic and Cubase were native DAWs,  
>>  
>>>but native was still too slow  
>>>to compete with hardware hybrids. Paris trumped them all by running  
>>>32-bit  
>>  
>>>float natively (not new really, but  
>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
of  
>>  
>>>going to Motorola DSPs at 24.  
>>>The onboard effects were also a step up from anything out there, so the  
>> demo  
>>>did sound good.  
>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>sloppy production and  
>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>  
>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>> no  
>>>one else had. With very nice  
>>>onboard effects, Paris jumped ahead of anything else out there easily,  
and  
>>  
>>>still respectably holds its' own today  
>>>in that department.  
>>>

>>>Most demos I hear (when I listen to them) vary in quality, usually not so  
>>  
>>>great in some area. But if a demo does  
>>>sound great, then it at least says that the product is capable of at  
  
>>>least  
>>  
>>>that level of performance, and it can  
>>>only help improve a prospective buyer's impression of it.  
>>>  
>>>Regards,  
>>>Dedric  
>>>  
>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>  
>>>> Dedric good post..  
>>>>  
>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and it  
>>  
>>>> has  
>>>> that same sound (no eq, zero fader) that HD does. I know their use the  
>>  
>>>> same  
>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>> fader)..results.  
>>>> different sonic character.  
>>>>  
>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm just  
>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>> ..zilch..nada..  
>>>>  
>>>> Now, there are devices (keyboards, dum machines) on the market today  
  
>>>> that  
>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>  
>>>> up.  
>>>> Why? because it gives their product an competitive advantageover the  
>>>> competition..  
>>>> Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>  
>>>> So, why would'nt a DAW manufactuer code in an extra (oommf) to make  
  
>>>> their  
>>>> DAW sound better. Especially, given the "I hate Digital Summing" crowd?

>>  
>>>> And,  
>>>> If I'm a DAW manufactuer, what would give my product a sonic edge over  
>> the  
>>>> competition?  
>>>>  
>>>> We live in the "louder is better" audio world these days, so a DAW that  
>>  
>>>> can  
>>>> catch my attention 'sonically" will probaly will get the sell. That's  
>> what  
>>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
>> to  
>>>> this day, nothing has floored me like that "Road House Blues Demo" I  
  
>>>> heard  
>>>> on Paris.  
>>>>  
>>>> Was it the hardware ? was it the software. I remember talking with  
>>>> Edmund  
>>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>>> reproduce  
>>>> the sonics of big buck analog board (eq's) and all.. And, summing was  
>> a  
>>>> big  
>>>> big issue for them because they (ID) thought that nobody has gotten  
>>>> it(summing)  
>>>> right. And by right, they meant, behaved like a console with a wide  
lane  
>>>> for all of those tracks..  
>>>>  
>>>>  
>>>>  
>>>>  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>news:458be8d5\$1@linux...  
>>>>>>  
>>>>>> Okay...  
>>>>>> I guess what I'm saying is this:  
>>>>>>  
>>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>>> differently  
>>>>>> for sound results.  
>>>>>>  
>>>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>>>specific  
>>>>>>>



>>>>>sound shaping purpose  
>>>>>beyond normal summing/mixing. Users talk about wanting developers to  
>> add  
>>>> a  
>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>but that's really impractical given the amount of dsp required to make  
>> a  
>>>>>  
>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>etc). For sake of not eating up all cpu processing, that could likely  
>>  
>>>>>only  
>>>>>  
>>>>>surface as is a built in EQ, which  
>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>  
>>>>>So it hasn't happened yet and isn't likely to as it detours from the  
  
>>>>>basic  
>>>>>  
>>>>>tenant of audio recording - recreate what comes in as  
>>>>>accurately as possible.  
>>>>>  
>>>>>What Digi did in recoding their summing engine was try to recover some  
>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k dsps  
>>>> are  
>>>>>24-bit fixed point chips and I think  
>>>>>the new generation (321?) still is, but they use double words now for  
>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>> the  
>>>>>  
>>>>>buss  
>>>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>>>>  
>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
  
>>>>>mixer  
>>>>> to  
>>>>>prevent this  
>>>>>constant truncation of data. 24-bits isn't enough to cover summing  
for  
>>>>> more  
>>>>>than a few tracks without  
>>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>>information will be lost, at least at the lowest levels.  
>>>>>

>>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>>  
>>>>>implement a 48-bit double word stage as well),  
>>>>>simply smoothed over the truncation that was happening, but it didn't  
>>  
>>>>>solve  
>>>>>  
>>>>>the problem, so with HD  
>>>>>they went to a double-word path - throughout I believe, including the  
>> path  
>>>>>  
>>>>>between chips. I believe the chips  
>>>>>are still 24-bit, but by doubling up the processing (yes at a cost of  
>>  
>>>>>twice  
>>>>>  
>>>>>the overhead), they get a 48-bit engine.  
>>>>>This not only provided better headroom, but greater resolution. Higher  
>>>>> bit  
>>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>>really where we get the definition of dynamic range - by lowering the  
>>  
>>>>>signal  
>>>>>  
>>>>>to quantization noise ratio.  
>>>>>  
>>>>>With DAWs that use 32-bit floating point math all the way through, the  
>>  
>>>>>only  
>>>>>  
>>>>>reason for altering the summing  
>>>>>is by error, and that's an error that would actually be hard to make  
and  
>>>>> get  
>>>>>past a very basic alpha stage of testing.  
>>>>>There is a small difference in fixed point math and floating point math,  
>>>>> or  
>>>>>at least a theoretical difference in how it affects audio  
>>>>>in certain cases, but not necessarily in the result for calculating  
gain  
>>>>> in  
>>>>>either for the same audio file. Where any differences might show up  
is  
>>>>>  
>>>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>>there are any differences in where each amplitude level is quantized.  
>>>>>

>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>depths  
>>>>  
>>>>throughout a single summing path to accomodate hardware  
>>>>as well as software summing, since there may be truncation or rounding  
>>  
>>>>along  
>>>>  
>>>>the way, but that impacts the lowest bit  
>>>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>>>"depth",  
>>>>  
>>>>not the levels most music so the differences are most  
>>>>often more subtle than not. But most modern DAWs have eliminated those  
>>>>  
>>>>"rough edges" in the math by increasing the bit depth to accomodate  
  
>>>>normal  
>>>>  
>>>>summing required for mixing audio.  
>>>>  
>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
>> DAWs  
>>>>  
>>>>were never asked to sum beyond 24-bits,  
>>>>at least not on the upper end of the dynamic range, so everything that  
>>  
>>>>could  
>>>>  
>>>>represent 24-bits accurately would cancel. The only ones  
>>>>that didn't were ones that had a different bit depth and/or gain  
>>>>structure  
>>>>  
>>>>whether hybrid or native  
>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>> In  
>>>>  
>>>>this case, PTHD cancelled (when I tested it) with  
>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>> vs.  
>>>>  
>>>>32-bit float wasn't a factor.  
>>>>  
>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>  
>>>>Sequoia and Sonar cancel - both audibly and  
>>>>visually at inaudible levels, which only proves that one isn't making  
>> an

>>>>  
>>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>>and the math to add gain is simple, they shouldn't. The fact that they  
>>>> all  
>>>>>use 32-bit float all the way through eliminates a difference  
>>>>>in data structure as well, and this just verifies that. There was a  
  
>>>>>time  
>>>>  
>>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor went,  
>>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>>Nuendo/Cubase,  
>>>>  
>>>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>> but  
>>>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>>>That was an intentional choice by the developer, but he's the only one  
>> I  
>>>>  
>>>>>know of that stuck with 24-bit for summing  
>>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>>  
>>>>>Long answer, but to sum up, it is certainly physically \*possible\* for  
>> a  
>>>>  
>>>>>developer to code something differently intentionally, but not  
>>>>>in reality likely since it would be breaking some basic fixed point  
or  
>>>>>floating point math rules. Where the differences really  
>>>>>showed up in the past is with PT Mix systems where the limitation was  
>>  
>>>>>really  
>>>>  
>>>>>significant - e.g. 24 bit with truncation at several stages.  
>>>>>  
>>>>>That really isn't such an issue anymore. Given the differences in  
>>>>>workflow,  
>>>>  
>>>>>missing something in workflow or layout differences  
>>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the way  
>>>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>>>not software busses, so in Sonar, busses are actually outputs, and sub  
>>>>>busses are actually busses in Nuendo. There are no,  
>>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
>> -  
>>>> that  
>>>>>affects the results of some tests (though not basic

>>>>>summing) if not taken into account, but when taken into account, they  
>> work  
>>>>  
>>>>>exactly the same way).  
>>>>>  
>>>>>So at least when talking about apps with 32-bit float all the way  
>>>>>through,  
>>>>>  
>>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>>>  
>>>>>unless  
>>>>>there is an error somewhere, or variation in how the user duplicates  
the  
>>>>>  
>>>>>same mix in two different apps.  
>>>>>  
>>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>>  
>>>>>basis for recording and mixing from which users can make all  
>>>>>of the decisions as to how the final product will sound and not be  
>>>>>required  
>>>>>  
>>>>>to decide when purchasing a pricey console, and have to  
>>>>>focus their business on clients who want "that sound". I believe we  
are  
>>>>>  
>>>>>actually closer to the pure definition of recording now than  
>>>>>we once were.  
>>>>>  
>>>>>Regards,  
>>>>>Dedric  
>>>>>  
>>>>>  
>>>>>>  
>>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>>> un-cover  
>>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>>> Steinberg  
>>>>>> and so on..  
>>>>>>  
>>>>>> What's under the hood. To me and others,when Digi re-coded their  
>>>>>> summing  
>>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>>>  
>>>>>> bump.  
>>>>>> Where as Steinberg's summing is very neutral.  
>>>>>>  
>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:

>>>>>>Hi Neil,  
>>>>>>  
>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>through  
>>>>>>  
>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>conclusion - easy to do given how confusing digital audio can be.

>>>>>>Each  
>>>>>> word  
>>>>>>represents an amplitude  
>>>>>>point on a single curve that is changing over time, and can vary with  
>>>> a  
>>>>>>  
>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>modulation  
>>>>>> of  
>>>>>>a single waveform,  
>>>>>>that over a small amount of time creates the sound we translate -  
we  
>>  
>>>>>>don't  
>>>>>>  
>>>>>>really hear a single sample at a time,  
>>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>>represent  
>>>>>> a  
>>>>>>single positive or negative peak  
>>>>>>of a 22,050Hz waveform).  
>>>>>>  
>>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
>>>> 24,  
>>>>>>  
>>>>>>you may hear, and will see that easily,  
>>>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>>>audible  
>>>>>>  
>>>>>>the difference.  
>>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>>>  
>>>>>>that  
>>>>>>  
>>>>>>bit's impact will be  
>>>>>>if there is a variation.  
>>>>>>  
>>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>>>> then

>>>>>  
>>>>>>it simply be a  
>>>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>>>obvious  
>>>>>  
>>>>>>musical difference, but that should never  
>>>>>>happen in a phase cancellation test between identical files higher  
  
>>>>>>than  
>>>>>> bit  
>>>>>>24, unless there are clock sync problems,  
>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>  
>>>>>>By definition of what DAWs do during playback and record, every audio  
>>>>>  
>>>>>>stream  
>>>>>>  
>>>>>>has the same point in time (judged by the timeline)  
>>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>>>  
>>>>>>rate  
>>>>>>  
>>>>>>we are using. A phase cancellation test uses that  
>>>>>>fact to compare two audio files word for word (and hence bit for bit  
>>>>>  
>>>>>>since  
>>>>>>  
>>>>>>each bit of a 24-bit word would  
>>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
>>>>>>aligned  
>>>>>> to  
>>>>>>the same start point, sample  
>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>point,  
>>>>>>  
>>>>>>bit for bit, and one is phase inverted,  
>>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>>completely  
>>>>>>  
>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>must be the exact opposite of that same bit position in a word at  
the  
>>>> same  
>>>>>>  
>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>of the full difference file is valuable as it can show any differences  
>>>> in  
>>>>>>

>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>there is no audible difference, the visual followup will show if the  
>> two  
>>>>>>  
>>>>>>files truly cancel even a levels below hearing, or  
>>>>>>outside of a frequency change that we will perceive.  
>>>>>>  
>>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>thousands of samples. From a musical standpoint this is usually in  
>> a  
>>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>>show up as the difference between them, and that usually happens due  
>> to  
>>>>>> some  
>>>>>>form of processing difference between the files,  
>>>>>>such as EQ, compression, frequency dependant gain changes, etc. That  
>> is  
>>>>>> what  
>>>>>>I believe you are thinking through, but when  
>>>>>>talking about straight summing with no gain change (or known equal  
  
>>>>>>gain  
>>>>>>  
>>>>>>changes), we are only looking at linear, one for one  
>>>>>>comparisons between the two files' frequency representations.  
>>>>>>  
>>>>>>Regards,  
>>>>>>Dedric  
>>>>>>  
>>>>>>> Neil wrote:  
>>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
>> the  
>>>>>>>  
>>>>>>>>> last  
>>>>>>>>>  
>>>>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>>>>> quantization noise, which by technical rights, is considered below  
>>>> the  
>>>>>>>>>>  
>>>>>>>>>>>> level  
>>>>>>>>>>>>  
>>>>>>>>>>>>> of "cancellation" in such tests.  
>>>>>>>>>>>>>  
>>>>>>>>>>>>>>> I'm not necessarily talking about just the first bit or the  
>>>>>>>>>>>>>>>> last bit, but also everything in between... what happens on bit  
>>>>>>>>>>>>>>>>> #12, for example? Everything on bit #12 should be audible, but





least to my understanding there are many more than that.

Your not supposed to be able to hear this truncation distortion, but how the hell knows, and that's not math :-)

Chuck

"LaMOnT" <jjdpro@ameritech.net> wrote:

>  
>Dedric, check out this post from our dear friend Fredo: Neundo Moderator:  
>Explaining how Steingberg's audio engine works. Note the trade-offs..Meaning,  
>Steinberg's way of coding an audio-engine 32bit float is different than  
say  
>Magix Samplitude:  
>  
>Fredo  
>Administrative Moderator  
>  
>  
>Joined: 29 Dec 2004  
>Posts: 4213  
>Location: Belgium  
> Posted: Fri Dec 08, 2006 2:33 pm Post subject:  
>  
> -----  
>  
>I think I see where the problem is.  
>In my scenario's I don't have any track that goes over 0dBfs, but I have  
>always lowered one channel to compensate with another.  
>So, I never went over the 0dB fs limit.  
>  
>Here's the explanation:  
>  
>As soon as you go over 0dB, technically you are entering the domain of distortion.  
>  
>In a 32bit FP mixer, that is not the case since there is unlimited headroom.  
>  
>  
>Now follow me step by step please - read this slow and make sure you understand  
>-  
>  
>At the end of each "stage", there is an adder (a big calculator) which adds  
>all the numbers from the individual tracks that are routed to this "adder".  
>  
>The numbers are kept in the 80-bit registers and then brought back to 32bit  
>float.

>This process of bringing back the numbers from 80-bit (and more) to 32bit  
>is kept to an absolute minimum.  
>This adding/bringing back to 32bit is done at 3 places: After a plugin slot  
>(VST-specs for all plugin manufacturers) - Group Tracks and Master Tracks.  
>  
>  
>Now, as soon as you boost the volume above 0dB, you get more than 32bits.  
>Stay below 0dB and you will stay below 32 bits.  
>When the adders dump their results, the numbers are brought back from any  
>number of bits (say 60bit) to 32 bit float.  
>These numbers are simply truncated which results in distortion; that's the  
>noise/residue you find way down low.  
>There is an algorithm that protects us from additive errors - so these  
errors  
>can never come into the audible range.  
>So, as soon as you go over 0dB, you will see these kind of artifacts.  
>  
>It is debatable if this needs to be dithered or not. The problem -still  
is-  
>that it is very difficult to dither in a Floating Point environment.  
>Fact remains that the error shouldn't be bigger than 2 to 3 LSB's.  
>  
>Is this a problem?  
>In real world applicatations: NO.  
>In scientific -unrealistic- tests (forcing the erro ): YES.  
>  
>The alternative is having a Fixed point mixer, where you already would be  
>in trouble as soon as you boost one channel over 0dBfs. (or merge two files  
>that are @ 0dB)  
>Also, this problem will be pretty much gone as soon as we switch to the  
64  
>bit engine.  
>  
>  
>For the record, the test where Jake hears "music" as residue must be flawed.  
>You should hear noise/distortion from square waves.  
>  
>HTH  
>  
>Fredo  
>  
>  
>  
>  
>  
>"Dedric Terry" <dedric@echomg.com> wrote:  
>>I can't tell you why you hear ProTools differently than Nuendo using a

>>single file.  
>>There isn't any voodoo in the software, or hidden character enhancing dsp.  
>  
>>I'll see if  
>>I can round up an M-Powered system to compare with next month.  
>>  
>>For reference, everytime I open Sequoia I think I might hear a broader,  
>  
>>clean,  
>>and almost flat (spectrum, not depth) sound, but I don't - it's the same  
>as  
>>Nuendo, fwiw.  
>>Also I don't think what I was referring to was a theory from Chuck - I  
>  
>>believe that was what he  
>>discovered in the code.  
>>  
>>Digital mixers all have different preamps and converters. Unless you are  
>  
>>bypassing every  
>>EQ and converter and going digital in and out to the same converter when  
>  
>>comparing, it would be hard  
>>to say the mix engine itself sounds different than another mixer, but taken  
>  
>>as a whole, then  
>>certainly they may very well sound different. In addition, hardware digital  
>>mixers may use a variety of different paths between the I/O, channel  
>>processing, and summing,  
>>though most are pretty much software mixers on a single chip or set of  
dsps  
>  
>>similar to ProTools,  
>>with I/O and a hardware surface attached.  
>>  
>>I know it may be hard to separate the mix engine as software in either  
a  
>  
>>native DAW  
>>or a digital mixer, from the hardware that translates the audio to something  
>  
>>we hear,  
>>but that's what is required when comparing summing. The hardware can  
>>significantly change  
>>what we hear, so comparing digital mixers really isn't of as much interest  
>  
>>as comparing native  
>>DAWs in that respect - unless you are looking to buy one of course.

>>  
>>Even though I know you think manufacturers are trying to add something to  
>  
>>give them an edge, I am 100%  
>>sure that isn't the case - rather they are trying to add or change as little  
>  
>>as possible in order to give  
>>them the edge. Their end of digital audio isn't about recreating the past,  
>  
>>but improving upon it.  
>>As we've discussed and agreed before, the obsession with recreating  
>>"vintage" technology is as much  
>>fad as it is a valuable creative asset. There is no reason we shouldn't  
>  
>>have far superior hardware and software EQs and comps  
>>than 20, 30 or 40 years ago. No reason at all, other than market demand,  
>  
>>but the majority of software, and new  
>>hardware gear on the market has a vintage marketing tagline with it.  
>>Companies will sell any bill of  
>>goods if customers will buy it.  
>>  
>>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>>or Sonar, and it's pretty safe to include Logic and DP in that list as  
well.  
>  
>>One of the reasons I test  
>>these things is to be sure my DAW isn't doing something wrong, or something  
>  
>>I don't know about.  
>>  
>>Vegas - I use it for video conversions and have never done any critical  
>  
>>listening tests with it. What I have heard  
>>briefly didn't sound any different. It certainly looks plain vanilla  
>>though. What you are describing is exactly  
>>what I would say about the GUIs of each of those apps, not that it means  
>  
>>anything. Just interesting.  
>>  
>>That's one reason I listen eyes closed and double check with phase  
>>cancellation tests and FFTs - I am  
>>influenced creatively by the GUI to some degree. I actually like Cubase  
>4's  
>>GUI better than Nuendo 3.2,  
>>though there are only slight visual differences (some workflow differences  
>

>>are a definite improvement for me though).  
>>  
>>ProTools' GUI always made me want to write one dimensional soundtracks  
in  
>  
>>mono for public utilities, accounting offices  
>>or the IRS while reading my discreet systems analysis textbook - it was  
>also  
>>grey. ;-)  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>>  
>>> Dedric, my simple test is simple..  
>>> Using the same audio interface, with the same stereo file..null-ed to  
>  
>>> zero..No  
>>> eq, for fx. Master fader on zero..  
>>>  
>>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that  
>|  
>>> have  
>>> referenced before.. The sound coming from PT-M has a nice top end , where  
>>> as Neundo has a nice flatter sound quality.  
>>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>>  
>>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
>  
>>> the  
>>> 192 interface.  
>>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>>  
>>> Somethings going on.  
>>>  
>>> Chucks post about how paris handles audio is a theory..Only Edmund can  
>  
>>> truly  
>>> give us the goods on what's really what..  
>>>  
>>> I disagree that manufactuers don;t set out o put a sonic print on their  
>  
>>> products.  
>>> I think they do.  
>>>  
>>> I have been fortunate to work on some digital mixers and I can tell you  
>

>>> that  
>>> each one has their own sound. The Sony Dmx-100 was modeled after SSL  
4000g  
>>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
>warm  
>>> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
>>> Dm2000(version 1.x) which has a very Clean, neutral sound..However, some  
>>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
>  
>>> which  
>>> added Vintage type Eq's, modeled analog input gain saturation fx too  
give  
>>> the user a choice Btw Clean and Neutral vs sonic Character.  
>>>  
>>> So, if digital conoles can be given a sonic character, why not a software  
>>> mixer?  
>>> The truth is, there are some folks who want a neutral mixer and then  
there  
>>> are others who want a sonic footprint imparted. and these can be coded  
>in  
>>> the digital realm.  
>>> The applies with the manufactuers. They too have their vision on what  
>They  
>>> think and want their product to sound.  
>>>  
>>> I love reading on gearslutz the posts from Plugin developers and their  
>  
>>> interpretations  
>>> and opinions about what makes their Neve 1073 Eq better and what goes  
>into  
>>> making their version sound like it does.. Each Developer has a different  
>>> vision as to what the Neve 1073 should sound like. And yet they all sound  
>>> good , but slightly different.  
>>>  
>>> You stated that you use Vegas. Well as you know, Vegas has a very generic  
>>> sound..Just plain and simple. But, i bet you can tell the difference  
>on  
>>> your system when you play that same file in Neundo (No, fx, eq,  
>>> null-edzerro)..  
>>> ???  
>>>  
>>>  
>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>Lamont - what is the output chain you are using for each app when  
>>>>comparing  
>>>  
>>>>the file in Nuendo  
>>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?

>>>>Since these can't use the same output driver, you would have to depend  
>on  
>>>  
>>>>the D/A being  
>>>>the same, but clocking will be different unless you have a master clock,  
>>> and  
>>>>both interfaces  
>>>>are locking with the same accuracy. This was one of the issues that  
>came  
>>> up  
>>>>at Lynn Fuston's  
>>>>D/A converter shootout - when do you lock to external clock and incur  
>the  
>>>  
>>>>resulting jitter,  
>>>>and when do you trust the internal clock - and if you do lock externally,  
>>>  
>>>>how good is the PLL  
>>>>in the slave device? These issues can cause audible changes in the top  
>>> end  
>>>>that have nothing to do  
>>>>with the software itself. If you say that PTHD through the same converter  
>>>  
>>>>output as Nuendo (via? RME?  
>>>>Lynx?) using the same master clock, sounds different playing a single  
>  
>>>>audio  
>>>  
>>>>file, then I take your word  
>>>>for it. I can't tell you why that is happening - only that an audible  
>>>>difference really shouldn't happen due  
>>>>to the software alone - not with a single audio file, esp. since I've  
>  
>>>>heard  
>>>  
>>>>and seen PTHD audio cancel with  
>>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
>to  
>>> the  
>>>>output driver should  
>>>>be, and usually is, completely transparent, bit for bit.  
>>>>  
>>>>The same audio file played through the same converters should only sound  
>>>  
>>>>different if something in  
>>>>the chain is different - be it clocking, gain or some degree of  
>>>>unintended,  
>>>



>>>>errant dsp processing. Every DAW should  
>>>>pass a single audio file without altering a single bit. That's a basic  
>  
>>>>level  
>>>  
>>>>of accuracy we should always  
>>>>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
>>>  
>>>>mix will be altered in ways you  
>>>>didn't intend, even though you would end up mixing with that factor in  
>  
>>>>place  
>>>  
>>>>(e.g. you still mix for what  
>>>>you want to hear regardless of what the platform does to each audio track  
>>> or  
>>>>channel).

>>>>  
>>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>>lightpipe to another DAW, record it  
>>>>bring the recorded file back in, line them up to the first bit, and have  
>>>  
>>>>them cancel on and inverted phase  
>>>>test. I did this with Nuendo and Cubase 4 on separate machines just  
to  
>>> be  
>>>>sure my master clocking and  
>>>>slave sync was accurate - it worked perfectly.

>>>>  
>>>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>>> the  
>>>>two. There shouldn't  
>>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>>different  
>>>  
>>>>pan law? Shouldn't make a  
>>>>difference even if comparing two mono panned files to their stereo  
>>>>interleaved equivalent, but for sake  
>>>>of completeness it's worth checking as well. A variation in the output  
>>>  
>>>>chain, be it drivers, audio card  
>>>>card, or converters would be the most likely culprit here.

>>>>  
>>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>>intentionally is that the  
>>>>ultimate goal from day one with recording has been to accurately reproduce  
>>>  
>>>>what we hear.

>>>>We developed a musical penchant for sonic character because the hardware  
>>>  
>>>>just wasn't accurate,  
>>>>and what it did often sent us down new creative paths - even if by force  
>>> -  
>>>>and we decided it was  
>>>>preferred that way.  
>>>>  
>>>>Your point about what goes into the feature presets to sell synths is  
>  
>>>>right  
>>>  
>>>>for sure, but synths are about  
>>>>character and getting that "perfect piano" or crystal clear bell pad,  
>or  
>>> fat  
>>>>punchy bass without spending  
>>>>a mint on development, adding 50G onboard sample libraries, or costing  
>  
>>>>\$15k,  
>>>  
>>>>so what they  
>>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>>> on  
>>>>the output. That's been the case  
>>>>for years, at least since we had effects on synths at least. But even  
>  
>>>>with  
>>>  
>>>>modern synths such as the Fantom,  
>>>>Tritons, etc, which are great synths all around, of course the coolest,  
>>>  
>>>>widest and biggest patches  
>>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>>  
>>>>reverbs, chorus, etc. The best  
>>>>way to find out if a synth is really good is to bypass all effects and  
>see  
>>>  
>>>>what happens. Most are pretty  
>>>>good these days, but about half the time, there are presets that fall  
>>>>completely flat in fx bypass.  
>>>>  
>>>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>>>  
>>>>are - they are designed  
>>>>to \*not\* add anything - to pass through what we create as users, with  
>no

>>>  
>>>>alteration (or as little as possible)  
>>>>beyond what we add with intentional processing (EQ, comps, etc).  
>>>>Developers  
>>>  
>>>>would find no pride  
>>>>in hearing that their DAW sounds anything different than whatever is  
being  
>>>  
>>>>played back in it,  
>>>>and the concept is contrary to what AES and IEEE proceedings on the issue  
>>>  
>>>>propose in general  
>>>>digital audio discussions, white papers, etc.  
>>>>  
>>>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>>>  
>>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>>is drop the track gain by 20dB or so, then added it back at the master  
>  
>>>>buss  
>>>  
>>>>to create the effect of headroom (probably  
>>>>because the master buss is really summing on the card, and they have  
more  
>>>  
>>>>headroom there than on the tracks  
>>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>>  
>>>>float files to the EDS card, but sort of  
>>>>doubt it. I think Chuck has clarified this at one point, but don't recall  
>>>  
>>>>the answer.  
>>>>  
>>>>Also what Paris did is use a greater bit depth on the hardware than  
>>>>ProTools  
>>>  
>>>>did - at the time PT was just  
>>>>bring Mix+ systems to market, or they had been out for a year or two  
(if  
>>> I  
>>>>have my timeline right) - they  
>>>>were 24-bit fixed all the way through. Logic and Cubase were native  
DAWs,  
>>>  
>>>>but native was still too slow  
>>>>to compete with hardware hybrids. Paris trumped them all by running

>>>>32-bit  
>>>  
>>>>float natively (not new really, but  
>>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
>of  
>>>  
>>>>going to Motorola DSPs at 24.  
>>>>The onboard effects were also a step up from anything out there, so the  
>>> demo  
>>>>did sound good.  
>>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>>sloppy production and  
>>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>>  
>>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>>> no  
>>>>one else had. With very nice  
>>>>onboard effects, Paris jumped ahead of anything else out there easily,  
>and  
>>>  
>>>>still respectably holds its' own today  
>>>>in that department.  
>>>>  
>>>>Most demos I hear (when I listen to them) vary in quality, usually not  
>so  
>>>  
>>>>great in some area. But if a demo does  
>>>>sound great, then it at least says that the product is capable of at  
>  
>>>>least  
>>>  
>>>>that level of performance, and it can  
>>>>only help improve a prospective buyer's impression of it.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>>  
>>>>> Dedric good post..  
>>>>>  
>>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and  
>it  
>>>  
>>>>> has  
>>>>> that same sound (no eq, zero fader) that HD does. I know their use  
the  
>>>

>>>> same  
>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>> fader)..results.  
>>>> different sonic character.  
>>>>  
>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm  
>just  
>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>> ..zilch..nada..  
>>>>  
>>>> Now, there are devices (keyboards, dum machines) on the market today  
>  
>>>> that  
>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>>  
>>>> up.  
>>>> Why? because it gives their product an competitive advantageover the  
>>>> competition..  
>>>> Ex: Yamaha's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>  
>>>> So, why would'nt a DAW manufactuer code in an extra (oommf) to make  
>  
>>>> their  
>>>> DAW sound better. Especially, given the "I hate Digtal Summing" crowd?  
>>>  
>>>> And,  
>>>> If I'm a DAW manufactuer, what would give my product a sonic edge over  
>>> the  
>>>> competition?  
>>>>  
>>>> We live in the "louder is better" audio world these days, so a DAW  
that  
>>>  
>>>> can  
>>>> catch my attention 'sonically" will probaly will get the sell. That's  
>>> what  
>>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
>>> to  
>>>> this day, nothing has floored me like that "Road House Blues Demo"  
I  
>  
>>>> heard  
>>>> on Paris.  
>>>>  
>>>> Was it the hardware ? was it the software. I remember talking with  
  
>>>> Edmund  
>>>> at the 2000 winter Namm, and told me that he & Steve set out to

>>>> reproduce  
>>>> the sonics of big buck analog board (eq's) and all.. And, summing was  
>>> a  
>>>> big  
>>>> big issue for them because they (ID) thought that nobody has gotten  
>>>> it(summing)  
>>>> right. And by right, they meant, behaved like a console with a wide  
>lane  
>>>> for all of those tracks..  
>>>>  
>>>>  
>>>>  
>>>>  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>news:458be8d5\$1@linux...  
>>>>>>  
>>>>>> Okay...  
>>>>>> I guess what I'm saying is this:  
>>>>>>  
>>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>>> differently  
>>>>>> for sound results.  
>>>>>>  
>>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>>specific  
>>>>>  
>>>>>>sound shaping purpose  
>>>>>>beyond normal summing/mixing. Users talk about wanting developers  
>to  
>>> add  
>>>> a  
>>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>>but that's really impractical given the amount of dsp required to make  
>>> a  
>>>>>  
>>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>>etc). For sake of not eating up all cpu processing, that could likely  
>>>  
>>>>>>only  
>>>>>>  
>>>>>>surface as is a built in EQ, which  
>>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>>  
>>>>>>So it hasn't happened yet and isn't likely to as it detours from the  
>  
>>>>>>basic  
>>>>>>

>>>>>tenant of audio recording - recreate what comes in as  
>>>>>accurately as possible.  
>>>>>  
>>>>>What Digi did in recoding their summing engine was try to recover some  
>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k  
dsp  
>>>>> are  
>>>>>24-bit fixed point chips and I think  
>>>>>the new generation (321?) still is, but they use double words now for  
>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>>> the  
>>>>>  
>>>>>buss  
>>>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>>>>  
>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
>  
>>>>>mixer  
>>>>> to  
>>>>>prevent this  
>>>>>constant truncation of data. 24-bits isn't enough to cover summing  
>for  
>>>>> more  
>>>>>than a few tracks without  
>>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>>information will be lost, at least at the lowest levels.  
>>>>>  
>>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>>  
>>>>>implement a 48-bit double word stage as well),  
>>>>>simply smoothed over the truncation that was happening, but it didn't  
>>>  
>>>>>solve  
>>>>>  
>>>>>the problem, so with HD  
>>>>>they went to a double-word path - throughout I believe, including the  
>>> path  
>>>>>  
>>>>>between chips. I believe the chips  
>>>>>are still 24-bit, but by doubling up the processing (yes at a cost  
of  
>>>  
>>>>>twice  
>>>>>  
>>>>>the overhead), they get a 48-bit engine.  
>>>>>This not only provided better headroom, but greater resolution. Higher

>>>> bit  
>>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>>really where we get the definition of dynamic range - by lowering the  
>>>  
>>>>>signal  
>>>>>  
>>>>>to quantization noise ratio.  
>>>>>  
>>>>>With DAWs that use 32-bit floating point math all the way through,  
the  
>>>  
>>>>>only  
>>>>>  
>>>>>reason for altering the summing  
>>>>>is by error, and that's an error that would actually be hard to make  
>and  
>>>> get  
>>>>>past a very basic alpha stage of testing.  
>>>>>There is a small difference in fixed point math and floating point  
math,  
>>>>> or  
>>>>>at least a theoretical difference in how it affects audio  
>>>>>in certain cases, but not necessarily in the result for calculating  
>gain  
>>>>> in  
>>>>>either for the same audio file. Where any differences might show up  
>is  
>>>>>  
>>>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>>there are any differences in where each amplitude level is quantized.  
>>>>>  
>>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>>depths  
>>>>>  
>>>>>throughout a single summing path to accomodate hardware  
>>>>>as well as software summing, since there may be truncation or rounding  
>>>  
>>>>>along  
>>>>>  
>>>>>the way, but that impacts the lowest bit  
>>>>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>>>>"depth",  
>>>>>  
>>>>>not the levels most music so the differences are most  
>>>>>often more subtle than not. But most modern DAWs have eliminated those  
>>>>>  
>>>>>"rough edges" in the math by increasing the bit depth to accomodate



>  
>>>>>normal  
>>>>>  
>>>>>summing required for mixing audio.  
>>>>>  
>>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
>>> DAWs  
>>>>>  
>>>>>were never asked to sum beyond 24-bits,  
>>>>>at least not on the upper end of the dynamic range, so everything that  
>>>  
>>>>>could  
>>>>>  
>>>>>represent 24-bits accurately would cancel. The only ones  
>>>>>that didn't were ones that had a different bit depth and/or gain  
>>>>>structure  
>>>>>  
>>>>>whether hybrid or native  
>>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>>> In  
>>>>>  
>>>>>this case, PTHD cancelled (when I tested it) with  
>>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>>> vs.  
>>>>>  
>>>>>32-bit float wasn't a factor.  
>>>>>  
>>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>>  
>>>>>Sequoia and Sonar cancel - both audibly and  
>>>>>visually at inaudible levels, which only proves that one isn't making  
>>> an  
>>>>>  
>>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>>and the math to add gain is simple, they shouldn't. The fact that  
they  
>>>>> all  
>>>>>use 32-bit float all the way through eliminates a difference  
>>>>>in data structure as well, and this just verifies that. There was  
a  
>  
>>>>>time  
>>>>>  
>>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor  
went,  
>>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>>Nuendo/Cubase,  
>>>>>

>>>>> Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>> I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>>> but  
>>>>> I don't know if it is still 24-bit, or now 48 bit.  
>>>>> That was an intentional choice by the developer, but he's the only  
one  
>>> I  
>>>>>  
>>>>> know of that stuck with 24-bit for summing  
>>>>> intentionally, esp. after the Digi Mix system mixer incident.  
>>>>>  
>>>>> Long answer, but to sum up, it is certainly physically \*possible\* for  
>>> a  
>>>>>  
>>>>> developer to code something differently intentionally, but not  
>>>>> in reality likely since it would be breaking some basic fixed point  
>or  
>>>>> floating point math rules. Where the differences really  
>>>>> showed up in the past is with PT Mix systems where the limitation was  
>>>  
>>>>> really  
>>>>>  
>>>>> significant - e.g. 24 bit with truncation at several stages.  
>>>>>  
>>>>> That really isn't such an issue anymore. Given the differences in  
>>>>> workflow,  
>>>>>  
>>>>> missing something in workflow or layout differences  
>>>>> is easy enough to do (e.g. Sonar doesn't have group and busses the  
way  
>>>>> Nuendo does, as it's outputs are actually driver outputs,  
>>>>> not software busses, so in Sonar, busses are actually outputs, and  
sub  
>>>>> busses are actually busses in Nuendo. There are no,  
>>>>> or at least I haven't found the equivalent of a Nuendo group in Sonar  
>>> -  
>>>>> that  
>>>>> affects the results of some tests (though not basic  
>>>>> summing) if not taken into account, but when taken into account, they  
>>> work  
>>>>>  
>>>>> exactly the same way).  
>>>>>  
>>>>> So at least when talking about apps with 32-bit float all the way  
>>>>> through,  
>>>>>  
>>>>> it's safe to say (since it has been proven) that summing isn't different  
>>>>>

>>>>>unless  
>>>>>there is an error somewhere, or variation in how the user duplicates  
>the  
>>>>>  
>>>>>same mix in two different apps.  
>>>>>  
>>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>>  
>>>>>basis for recording and mixing from which users can make all  
>>>>>of the decisions as to how the final product will sound and not be  
>>>>>required  
>>>>>  
>>>>>to decide when purchasing a pricey console, and have to  
>>>>>focus their business on clients who want "that sound". I believe we  
>are  
>>>>>  
>>>>>actually closer to the pure definition of recording now than  
>>>>>we once were.  
>>>>>  
>>>>>Regards,  
>>>>>Dedric  
>>>>>  
>>>>>  
>>>>>  
>>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>>> un-cover  
>>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>>> Steinberg  
>>>>>> and so on..  
>>>>>>  
>>>>>> What's under the hood. To me and others,when Digi re-coded their  
  
>>>>>> summing  
>>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>>>  
>>>>>> bump.  
>>>>>> Where as Steinberg's summing is very neutral.  
>>>>>>  
>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>Hi Neil,  
>>>>>>>  
>>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>>through  
>>>>>>>  
>>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>>conclusion - easy to do given how confusing digital audio can be.  
>  
>>>>>>>Each

>>>>>> word  
>>>>>> represents an amplitude  
>>>>>> point on a single curve that is changing over time, and can vary  
with  
>>>>> a  
>>>>>>  
>>>>>> speed up to the Nyquist frequency (as Jamie described).  
>>>>>> The complex harmonic content we hear is actually the frequency  
>>>>>> modulation  
>>>>>> of  
>>>>>> a single waveform,  
>>>>>> that over a small amount of time creates the sound we translate -  
>we  
>>>  
>>>>>> don't  
>>>>>>  
>>>>>> really hear a single sample at a time,  
>>>>>> but thousands of samples at a time (1 sample alone could at most  
>>>>>> represent  
>>>>>> a  
>>>>>> single positive or negative peak  
>>>>>> of a 22,050Hz waveform).  
>>>>>>  
>>>>>> If one bit doesn't cancel, esp. if it's a higher order bit than number  
>>>>> 24,  
>>>>>>  
>>>>>> you may hear, and will see that easily,  
>>>>>> and the higher the bit in the dynamic range (higher order) the more  
>>>>>> audible  
>>>>>>  
>>>>>> the difference.  
>>>>>> Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>>>>  
>>>>>> that  
>>>>>>  
>>>>>> bit's impact will be  
>>>>>> if there is a variation.  
>>>>>>  
>>>>>> Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>>>>> then  
>>>>>>  
>>>>>> it simply be a  
>>>>>> click (only audible if it's a high enough order bit) instead of an  
>>>>>> obvious  
>>>>>>  
>>>>>> musical difference, but that should never  
>>>>>> happen in a phase cancellation test between identical files higher  
>

>>>>>>>than  
>>>>>>> bit  
>>>>>>>24, unless there are clock sync problems,  
>>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>>  
>>>>>>>By definition of what DAWs do during playback and record, every audio  
>>>>>>>  
>>>>>>>stream  
>>>>>>>  
>>>>>>>has the same point in time (judged by the timeline)  
>>>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>>>>>  
>>>>>>>rate  
>>>>>>>  
>>>>>>>we are using. A phase cancellation test uses that  
>>>>>>>fact to compare two audio files word for word (and hence bit for  
bit  
>>>  
>>>>>>>since  
>>>>>>>  
>>>>>>>each bit of a 24-bit word would  
>>>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
  
>>>>>>>aligned  
>>>>>>> to  
>>>>>>>the same start point, sample  
>>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>>point,  
>>>>>>>  
>>>>>>>bit for bit, and one is phase inverted,  
>>>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>>>completely  
>>>>>>>  
>>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>>must be the exact opposite of that same bit position in a word at  
>the  
>>>>> same  
>>>>>>>  
>>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>>of the full difference file is valuable as it can show any differences  
>>>>> in  
>>>>>>>  
>>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>>there is no audible difference, the visual followup will show if  
the  
>>> two  
>>>>>>>  
>>>>>>>files truly cancel even a levels below hearing, or

>>>>>>>outside of a frequency change that we will perceive.  
>>>>>>>  
>>>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>>thousands of samples. From a musical standpoint this is usually  
in  
>>> a  
>>>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>>>show up as the difference between them, and that usually happens  
due  
>>> to  
>>>>>>> some  
>>>>>>>form of processing difference between the files,  
>>>>>>>such as EQ, compression, frequency dependant gain changes, etc. That  
>>> is  
>>>>>>> what  
>>>>>>>I believe you are thinking through, but when  
>>>>>>>talking about straight summing with no gain change (or known equal  
>  
>>>>>>>gain  
>>>>>>>  
>>>>>>>changes), we are only looking at linear, one for one  
>>>>>>>comparisons between the two files' frequency representations.  
>>>>>>>  
>>>>>>>Regards,  
>>>>>>>Dedric  
>>>>>>>  
>>>>>>> Neil wrote:  
>>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
>>> the  
>>>>>>>  
>>>>>>>>> last  
>>>>>>>>>  
>>>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>>>> quantization noise, which by technical rights, is considered  
below  
>>>>> the  
>>>>>>>  
>>>>>>>>> level  
>>>>>>>>>  
>>>>>>>>> of "cancellation" in such tests.  
>>>>>>>>>  
>>>>>>>>> I'm not necessarily talking about just the first bit or the  
>>>>>>>>> last bit, but also everything in between... what happens on bit  
>>>>>>>>> #12, for example? Everything on bit #12 should be audible, but  
>>>>>>>>> in an a/b test what if there are differences in what bits #8  
>>>>>>>>> through #12 sound like, but the amplitude is still the same on



has to make.

We were actually discussing what happens when you sum to a group vs. summing to the main bus, without overs. I did my test with all files summing to -20dB, so there was no chance of pushing the upper limits of 32-bit float's truncation back down to 24-bits. And I actually simplified it by using two copies of the same file (just as Fredo did), one phase inverted, both sample aligned. They cancelled to below 24 bits just as expected, and just as they should. The variations below 24 bits that I saw (and thought were above 24-bits at one point) are correlation of lower frequencies when gain and equivalent reduction are introduced (which is what Chuck stated that Paris does up front on every track). That really doesn't impact the audio itself since data below -136dB is quantization noise for 24-bit audio.

Sonar, Nuendo, Cubase 4 and Sequoia all behaved exactly the same way in this test - which tells me they are handling the LSB's the same way. When data is summed to groups, there will be quantization noise below -136dB. This is completely normal for any native DAW and they all are subject to it. As you might read in the thread my conclusion was that we proved digital audio theory exists - e.g. no uncharted territory, no digital audio frontiers, no bugs in Nuendo. yeeha. But that's what I get for second guessing talented developers. ;-)

Fwiw, to take it a step further, Samplitude/Sequoia and Nuendo handle overs, or "into the red" identically. I checked that too a while back after the reports of extra headroom, etc in Samplitude. Believe me, I've tried hard to find where any differences might appear, not just noticeable differences, but any differences at the lowest levels, but it seems the major native DAW players are making the same decisions when it comes to truncation, etc, and there really aren't that many to make. In my tests, dither really wasn't an issue (I turned it off in all DAWs I tested just to test with pure truncation).

Regards,  
Dedric

"LaMOnT" <jjdpro@ameritech.net> wrote:

>  
>Dedric, check out this post from our dear friend Fredo: Neundo Moderator:  
>Explaining how Steingberg's audio engine works. Note the trade-offs..Meaning,  
>Steinberg's way of coding an audio-engine 32bit float is different than  
say  
>Magix Samplitude:  
>  
>Fredo  
>Administrative Moderator  
>  
>  
>Joined: 29 Dec 2004



>Posts: 4213  
>Location: Belgium  
> Posted: Fri Dec 08, 2006 2:33 pm Post subject:  
>  
> -----  
>  
>I think I see where the problem is.  
>In my scenario's I don't have any track that goes over 0dBfs, but I have  
>always lowered one channel to compensate with another.  
>So, I never went over the 0dB fs limit.  
>  
>Here's the explanation:  
>  
>As soon as you go over 0dB, technically you are entering the domain of distortion.  
>  
>In a 32bit FP mixer, that is not the case since there is unlimited headroom.  
>  
>  
>Now follow me step by step please - read this slow and make sure you understand  
>-  
>  
>At the end of each "stage", there is an adder (a big calculator) which adds  
>all the numbers from the individual tracks that are routed to this "adder".  
>  
>The numbers are kept in the 80-bit registers and then brought back to 32bit  
>float.  
>This process of bringing back the numbers from 80-bit (and more) to 32bit  
>is kept to an absolute minimum.  
>This adding/bringing back to 32bit is done at 3 places: After a plugin slot  
>(VST-specs for all plugin manufacturers) - Group Tracks and Master Tracks.  
>  
>  
>Now, as soon as you boost the volume above 0dB, you get more than 32bits.  
>Stay below 0dB and you will stay below 32 bits.  
>When the adders dump their results, the numbers are brought back from any  
>number of bits (say 60bit) to 32 bit float.  
>These numbers are simply truncated which results in distortion; that's the  
>noise/residue you find way down low.  
>There is an algorithm that protects us from additive errors - so these  
errors  
>can never come into the audible range.  
>So, as soon as you go over 0dB, you will see these kind of artifacts.  
>  
>It is debatable if this needs to be dithered or not. The problem -still  
is-  
>that it is very difficult to dither in a Floating Point environment.  
>Fact remains that the error shouldn't be bigger than 2 to 3 LSB's.  
>

>Is this a problem?  
>In real world applications: NO.  
>In scientific -unrealistic- tests (forcing the error): YES.  
>  
>The alternative is having a Fixed point mixer, where you already would be  
>in trouble as soon as you boost one channel over 0dBfs. (or merge two files  
>that are @ 0dB)  
>Also, this problem will be pretty much gone as soon as we switch to the  
64  
>bit engine.  
>  
>  
>For the record, the test where Jake hears "music" as residue must be flawed.  
>You should hear noise/distortion from square waves.  
>  
>HTH  
>  
>Fredo  
>  
>  
>  
>  
>  
>"Dedric Terry" <dedric@echomg.com> wrote:  
>>I can't tell you why you hear ProTools differently than Nuendo using a  
  
>>single file.  
>>There isn't any voodoo in the software, or hidden character enhancing dsp.  
>  
>>I'll see if  
>>I can round up an M-Powered system to compare with next month.  
>>  
>>For reference, everytime I open Sequoia I think I might hear a broader,  
>  
>>clean,  
>>and almost flat (spectrum, not depth) sound, but I don't - it's the same  
>as  
>>Nuendo, fwiw.  
>>Also I don't think what I was referring to was a theory from Chuck - I  
>  
>>believe that was what he  
>>discovered in the code.  
>>  
>>Digital mixers all have different preamps and converters. Unless you are  
>  
>>bypassing every  
>>EQ and converter and going digital in and out to the same converter when  
>

>>comparing, it would be hard  
>>to say the mix engine itself sounds different than another mixer, but taken  
>  
>>as a whole, then  
>>certainly they may very well sound different. In addition, hardware digital  
>>mixers may use a variety of different paths between the I/O, channel  
>>processing, and summing,  
>>though most are pretty much software mixers on a single chip or set of  
dsps  
>  
>>similar to ProTools,  
>>with I/O and a hardware surface attached.  
>>  
>>I know it may be hard to separate the mix engine as software in either  
a  
>  
>>native DAW  
>>or a digital mixer, from the hardware that translates the audio to something  
>  
>>we hear,  
>>but that's what is required when comparing summing. The hardware can  
>>significantly change  
>>what we hear, so comparing digital mixers really isn't of as much interest  
>  
>>as comparing native  
>>DAWs in that respect - unless you are looking to buy one of course.  
>>  
>>Even though I know you think manufacturers are trying to add something  
to  
>  
>>give them an edge, I am 100%  
>>sure that isn't the case - rather they are trying to add or change as little  
>  
>>as possible in order to give  
>>them the edge. Their end of digital audio isn't about recreating the past,  
>  
>>but improving upon it.  
>>As we've discussed and agreed before, the obsession with recreating  
>>"vintage" technology is as much  
>>fad as it is a valuable creative asset. There is no reason we shouldn't  
>  
>>have far superior hardware and software EQs and comps  
>>than 20, 30 or 40 years ago. No reason at all, other than market demand,  
>  
>>but the majority of software, and new  
>>hardware gear on the market has a vintage marketing tagline with it.  
>>Companies will sell any bill of  
>>goods if customers will buy it.

>>  
>>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>>or Sonar, and it's pretty safe to include Logic and DP in that list as  
well.  
>  
>>One of the reasons I test  
>>these things is to be sure my DAW isn't doing something wrong, or something  
>  
>>I don't know about.  
>>  
>>Vegas - I use it for video conversions and have never done any critical  
>  
>>listening tests with it. What I have heard  
>>briefly didn't sound any different. It certainly looks plain vanilla  
>>though. What you are describing is exactly  
>>what I would say about the GUIs of each of those apps, not that it means  
>  
>>anything. Just interesting.  
>>  
>>That's one reason I listen eyes closed and double check with phase  
>>cancellation tests and FFTs - I am  
>>influenced creatively by the GUI to some degree. I actually like Cubase  
>4's  
>>GUI better than Nuendo 3.2,  
>>though there are only slight visual differences (some workflow differences  
>  
>>are a definite improvement for me though).  
>>  
>>ProTools' GUI always made me want to write one dimensional soundtracks  
in  
>  
>>mono for public utilities, accounting offices  
>>or the IRS while reading my discreet systems analysis textbook - it was  
>also  
>>grey. ;-)  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>>  
>>> Dedric, my simple test is simple..  
>>> Using the same audio interface, with the same stereo file..null-ed to  
>  
>>> zero..No  
>>> eq, for fx. Master fader on zero..  
>>>  
>>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that

>|  
>>> have  
>>> referenced before.. The sound coming from PT-M has a nice top end , where  
>>> as Neundo has a nice flatter sound quality.  
>>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>>  
>>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
>  
>>> the  
>>> 192 interface.  
>>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>>  
>>> Somethings going on.  
>>>  
>>> Chucks post about how paris handles audio is a theory..Only Edmund can  
>  
>>> truly  
>>> give us the goods on what's really what..  
>>>  
>>> I disagree that manufactuers don;t set out o put a sonic print on their  
>  
>>> products.  
>>> I think they do.  
>>>  
>>> I have been fortunate to work on some digital mixers and I can tell you  
>  
>>> that  
>>> each one has their own sound. The Sony Dmx-100 was modeled after SSL  
4000g  
>>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
>warm  
>>> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
>>> Dm2000(version 1.x) which has a very Clean, neutral sound..However, some  
>>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
>  
>>> which  
>>> added Vintage type Eq's, modeled analog input gain saturation fx too  
give  
>>> the user a choice Btw Clean and Neutral vs sonic Character.  
>>>  
>>> So, if digital conoles can be given a sonic character, why not a software  
>>> mixer?  
>>> The truth is, there are some folks who want a neutral mixer and then  
there  
>>> are others who want a sonic footprint imparted. and these can be coded  
>in  
>>> the digital realm.  
>>> The appllies with the manufactuers. They too have their vision on what

>They  
>>> think and want their product to sound.  
>>>  
>>> I love reading on gearslutz the posts from Plugin developers and their  
>  
>>> interpretations  
>>> and opinions about what makes their Neve 1073 Eq better and what goes  
>into  
>>> making their version sound like it does.. Each Developer has a different  
>>> vision as to what the Neve 1073 should sound like. And yet they all sound  
>>> good , but slightly different.  
>>>  
>>> You stated that you use Vegas. Well as you know, Vegas has a very generic  
>>> sound..Just plain and simple. But, i bet you can tell the difference  
>on  
>>> your system when you play that same file in Nuendo (No, fx, eq,  
>>> null-edzerro)..  
>>> ???  
>>>  
>>>  
>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>Lamont - what is the output chain you are using for each app when  
>>>>comparing  
>>>  
>>>>the file in Nuendo  
>>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?  
>>>>Since these can't use the same output driver, you would have to depend  
>on  
>>>  
>>>>the D/A being  
>>>>the same, but clocking will be different unless you have a master clock,  
>>> and  
>>>>both interfaces  
>>>>are locking with the same accuracy. This was one of the issues that  
came  
>>> up  
>>>>at Lynn Fuston's  
>>>>D/A converter shootout - when do you lock to external clock and incur  
>the  
>>>  
>>>>resulting jitter,  
>>>>and when do you trust the internal clock - and if you do lock externally,  
>>>  
>>>>how good is the PLL  
>>>>in the slave device? These issues can cause audible changes in the top  
>>> end  
>>>>that have nothing to do  
>>>>with the software itself. If you say that PTHD through the same converter

>>>  
>>>>output as Nuendo (via? RME?  
>>>>Lynx?) using the same master clock, sounds different playing a single  
>  
>>>>audio  
>>>  
>>>>file, then I take your word  
>>>>for it. I can't tell you why that is happening - only that an audible  
>>>>difference really shouldn't happen due  
>>>>to the software alone - not with a single audio file, esp. since I've  
>  
>>>>heard  
>>>  
>>>>and seen PTHD audio cancel with  
>>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
>to  
>>> the  
>>>>output driver should  
>>>>be, and usually is, completely transparent, bit for bit.  
>>>>  
>>>>The same audio file played through the same converters should only sound  
>>>  
>>>>different if something in  
>>>>the chain is different - be it clocking, gain or some degree of  
>>>>unintended,  
>>>  
>>>>errant dsp processing. Every DAW should  
>>>>pass a single audio file without altering a single bit. That's a basic  
>  
>>>>level  
>>>  
>>>>of accuracy we should always  
>>>>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
>>>  
>>>>mix will be altered in ways you  
>>>>didn't intend, even though you would end up mixing with that factor in  
>  
>>>>place  
>>>  
>>>>(e.g. you still mix for what  
>>>>you want to hear regardless of what the platform does to each audio track  
>>> or  
>>>>channel).

>>>>  
>>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>>lightpipe to another DAW, record it  
>>>>bring the recorded file back in, line them up to the first bit, and have  
>>>

>>>>them cancel on and inverted phase  
>>>>test. I did this with Nuendo and Cubase 4 on separate machines just  
to  
>>> be  
>>>>sure my master clocking and  
>>>>slave sync was accurate - it worked perfectly.  
>>>>  
>>>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>>> the  
>>>>two. There shouldn't  
>>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>>different  
>>>  
>>>>pan law? Shouldn't make a  
>>>>difference even if comparing two mono panned files to their stereo  
>>>>interleaved equivalent, but for sake  
>>>>of completeness it's worth checking as well. A variation in the output  
>>>  
>>>>chain, be it drivers, audio card  
>>>>card, or converters would be the most likely culprit here.  
>>>>  
>>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>>intentionally is that the  
>>>>ultimate goal from day one with recording has been to accurately reproduce  
>>>  
>>>>what we hear.  
>>>>We developed a musical penchant for sonic character because the hardware  
>>>  
>>>>just wasn't accurate,  
>>>>and what it did often sent us down new creative paths - even if by force  
>>> -  
>>>>and we decided it was  
>>>>preferred that way.  
>>>>  
>>>>Your point about what goes into the feature presets to sell synths is  
>  
>>>>right  
>>>  
>>>>for sure, but synths are about  
>>>>character and getting that "perfect piano" or crystal clear bell pad,  
>or  
>>> fat  
>>>>punchy bass without spending  
>>>>a mint on development, adding 50G onboard sample libraries, or costing  
>  
>>>>\$15k,  
>>>  
>>>>so what they



>>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>>> on  
>>>>the output. That's been the case  
>>>>for years, at least since we had effects on synths at least. But even  
>  
>>>>with  
>>>  
>>>>modern synths such as the Fantom,  
>>>>Tritons, etc, which are great synths all around, of course the coolest,  
>>>  
>>>>widest and biggest patches  
>>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>>  
>>>>reverbs, chorus, etc. The best  
>>>>way to find out if a synth is really good is to bypass all effects and  
>see  
>>>  
>>>>what happens. Most are pretty  
>>>>good these days, but about half the time, there are presets that fall  
>>>>completely flat in fx bypass.  
>>>>  
>>>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>>>  
>>>>are - they are designed  
>>>>to \*not\* add anything - to pass through what we create as users, with  
>no  
>>>  
>>>>alteration (or as little as possible)  
>>>>beyond what we add with intentional processing (EQ, comps, etc).  
>>>>Developers  
>>>  
>>>>would find no pride  
>>>>in hearing that their DAW sounds anything different than whatever is  
being  
>>>  
>>>>played back in it,  
>>>>and the concept is contrary to what AES and IEEE proceedings on the issue  
>>>  
>>>>propose in general  
>>>>digital audio discussions, white papers, etc.  
>>>>  
>>>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>>>  
>>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>>is drop the track gain by 20dB or so, then added it back at the master  
>  
>>>>buss  
>>>

>>>>to create the effect of headroom (probably  
>>>>because the master buss is really summing on the card, and they have  
more  
>>>  
>>>>headroom there than on the tracks  
>>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>>  
>>>>float files to the EDS card, but sort of  
>>>>doubt it. I think Chuck has clarified this at one point, but don't recall  
>>>  
>>>>the answer.  
>>>>  
>>>>Also what Paris did is use a greater bit depth on the hardware than  
>>>>ProTools  
>>>  
>>>>did - at the time PT was just  
>>>>bring Mix+ systems to market, or they had been out for a year or two  
(if  
>>> I  
>>>>have my timeline right) - they  
>>>>were 24-bit fixed all the way through. Logic and Cubase were native  
DAWs,  
>>>  
>>>>but native was still too slow  
>>>>to compete with hardware hybrids. Paris trumped them all by running  
  
>>>>32-bit  
>>>  
>>>>float natively (not new really, but  
>>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
>of  
>>>  
>>>>going to Motorola DSPs at 24.  
>>>>The onboard effects were also a step up from anything out there, so the  
>>> demo  
>>>>did sound good.  
>>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>>sloppy production and  
>>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>>  
>>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>>> no  
>>>>one else had. With very nice  
>>>>onboard effects, Paris jumped ahead of anything else out there easily,  
>and  
>>>  
>>>>still respectably holds its' own today  
>>>>in that department.

>>>>  
>>>>Most demos I hear (when I listen to them) vary in quality, usually not  
>so  
>>>  
>>>>great in some area. But if a demo does  
>>>>sound great, then it at least says that the product is capable of at  
>  
>>>>least  
>>>  
>>>>that level of performance, and it can  
>>>>only help improve a prospective buyer's impression of it.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>>  
>>>>> Dedric good post..  
>>>>>  
>>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and  
>it  
>>>  
>>>>> has  
>>>>> that same sound (no eq, zero fader) that HD does. I know their use  
the  
>>>  
>>>>> same  
>>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>>> fader)..results.  
>>>>> different sonic character.  
>>>>>  
>>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm  
>just  
>>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>>> ..zilch..nada..  
>>>>>  
>>>>> Now, there are devices (keyboards, dum machines) on the market today  
>  
>>>>> that  
>>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>>  
>>>>> up.  
>>>>> Why? because it gives their product an competitive advantageover the  
>>>>> competition..  
>>>>> Ex: Yamaha's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>>  
>>>>> So, why would'nt a DAW manufactuer code in an extra (oommf) to make  
>

>>>> their  
>>>> DAW sound better. Especially, given the "I hate Digital Summing" crowd?  
>>>  
>>>> And,  
>>>> If I'm a DAW manufacturer, what would give my product a sonic edge over  
>>> the  
>>>> competition?  
>>>>  
>>>> We live in the "louder is better" audio world these days, so a DAW  
that  
>>>  
>>>> can  
>>>> catch my attention 'sonically" will probably will get the sell. That's  
>>> what  
>>>> happened to me back in 1997 when I heard Paris. I was floored!!! Still  
>>> to  
>>>> this day, nothing has floored me like that "Road House Blues Demo"  
I  
>  
>>>> heard  
>>>> on Paris.  
>>>>  
>>>> Was it the hardware ? was it the software. I remember talking with  
  
>>>> Edmund  
>>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>>> reproduce  
>>>> the sonics of big buck analog board (eq's) and all.. And, summing was  
>>> a  
>>>> big  
>>>> big issue for them because they (ID) thought that nobody has gotten  
>>>> it(summing)  
>>>> right. And by right, they meant, behaved like a console with a wide  
>lane  
>>>> for all of those tracks..  
>>>>  
>>>>  
>>>>  
>>>>  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>news:458be8d5\$1@linux...  
>>>>>>  
>>>>>> Okay...  
>>>>>> I guess what I'm saying is this:  
>>>>>>  
>>>>>> -Is it possible that different DAW manufacturers "code" their app  
>>>>>> differently

>>>>>> for sound results.  
>>>>>>  
>>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>>specific  
>>>>>>  
>>>>>>sound shaping purpose  
>>>>>>beyond normal summing/mixing. Users talk about wanting developers  
to  
>>> add  
>>>>> a  
>>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>>but that's really impractical given the amount of dsp required to make  
>>> a  
>>>>>>  
>>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>>etc). For sake of not eating up all cpu processing, that could likely  
>>>  
>>>>>>only  
>>>>>>  
>>>>>>surface as is a built in EQ, which  
>>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>>  
>>>>>>So it hasn't happened yet and isn't likely to as it detours from the  
>  
>>>>>>basic  
>>>>>>  
>>>>>>tenant of audio recording - recreate what comes in as  
>>>>>>accurately as possible.  
>>>>>>  
>>>>>>What Digi did in recoding their summing engine was try to recover some  
>>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k  
dsps  
>>>>> are  
>>>>>>24-bit fixed point chips and I think  
>>>>>>the new generation (321?) still is, but they use double words now for  
>>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>>> the  
>>>>>>  
>>>>>>buss  
>>>>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>>>>>  
>>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
>  
>>>>>>mixer  
>>>>>> to  
>>>>>>prevent this

>>>>>constant truncation of data. 24-bits isn't enough to cover summing  
>for  
>>>>> more  
>>>>>than a few tracks without  
>>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>>information will be lost, at least at the lowest levels.  
>>>>>  
>>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>>  
>>>>>implement a 48-bit double word stage as well),  
>>>>>simply smoothed over the truncation that was happening, but it didn't  
>>>  
>>>>>solve  
>>>>>  
>>>>>the problem, so with HD  
>>>>>they went to a double-word path - throughout I believe, including the  
>>> path  
>>>>>  
>>>>>between chips. I believe the chips  
>>>>>are still 24-bit, but by doubling up the processing (yes at a cost  
>of  
>>>  
>>>>>twice  
>>>>>  
>>>>>the overhead), they get a 48-bit engine.  
>>>>>This not only provided better headroom, but greater resolution. Higher  
>>>>> bit  
>>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>>really where we get the definition of dynamic range - by lowering the  
>>>  
>>>>>signal  
>>>>>  
>>>>>to quantization noise ratio.  
>>>>>  
>>>>>With DAWs that use 32-bit floating point math all the way through,  
>the  
>>>  
>>>>>only  
>>>>>  
>>>>>reason for altering the summing  
>>>>>is by error, and that's an error that would actually be hard to make  
>and  
>>>>> get  
>>>>>past a very basic alpha stage of testing.  
>>>>>There is a small difference in fixed point math and floating point  
>math,  
>>>>> or  
>>>>>at least a theoretical difference in how it affects audio

>>>>>in certain cases, but not necessarily in the result for calculating  
>gain  
>>>>> in  
>>>>>either for the same audio file. Where any differences might show up  
>is  
>>>>>  
>>>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>>there are any differences in where each amplitude level is quantized.  
>>>>>  
>>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>>depths  
>>>>>  
>>>>>throughout a single summing path to accommodate hardware  
>>>>>as well as software summing, since there may be truncation or rounding  
>>>  
>>>>>along  
>>>>>  
>>>>>the way, but that impacts the lowest bit  
>>>>>level, and hence - spatial reproduction, reverb tails perhaps, and  
>>>>>"depth",  
>>>>>  
>>>>>not the levels most music so the differences are most  
>>>>>often more subtle than not. But most modern DAWs have eliminated those  
>>>>>  
>>>>>"rough edges" in the math by increasing the bit depth to accommodate  
>  
>>>>>normal  
>>>>>  
>>>>>summing required for mixing audio.  
>>>>>  
>>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
>>> DAWs  
>>>>>  
>>>>>were never asked to sum beyond 24-bits,  
>>>>>at least not on the upper end of the dynamic range, so everything that  
>>>  
>>>>>could  
>>>>>  
>>>>>represent 24-bits accurately would cancel. The only ones  
>>>>>that didn't were ones that had a different bit depth and/or gain  
>>>>>structure  
>>>>>  
>>>>>whether hybrid or native  
>>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>>> In  
>>>>>  
>>>>>this case, PTHD cancelled (when I tested it) with

>>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>>> vs.  
>>>>>  
>>>>>32-bit float wasn't a factor.  
>>>>>  
>>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>>  
>>>>>Sequoia and Sonar cancel - both audibly and  
>>>>>visually at inaudible levels, which only proves that one isn't making  
>>> an  
>>>>>  
>>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>>and the math to add gain is simple, they shouldn't. The fact that  
they  
>>>>> all  
>>>>>use 32-bit float all the way through eliminates a difference  
>>>>>in data structure as well, and this just verifies that. There was  
a  
>  
>>>>>time  
>>>>>  
>>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor  
went,  
>>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>>Nuendo/Cubase,  
>>>>>  
>>>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>>> but  
>>>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>>>That was an intentional choice by the developer, but he's the only  
one  
>>> I  
>>>>>  
>>>>>know of that stuck with 24-bit for summing  
>>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>>  
>>>>>Long answer, but to sum up, it is certainly physically \*possible\* for  
>>> a  
>>>>>  
>>>>>developer to code something differently intentionally, but not  
>>>>>in reality likely since it would be breaking some basic fixed point  
>or  
>>>>>floating point math rules. Where the differences really  
>>>>>showed up in the past is with PT Mix systems where the limitation was  
>>>  
>>>>>really  
>>>>>



>>>>>significant - e.g. 24 bit with truncation at several stages.  
>>>>>  
>>>>>That really isn't such an issue anymore. Given the differences in  
>>>>>workflow,  
>>>>>  
>>>>>missing something in workflow or layout differences  
>>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the  
way  
>>>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>>>not software busses, so in Sonar, busses are actually outputs, and  
sub  
>>>>>busses are actually busses in Nuendo. There are no,  
>>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
>>> -  
>>>>> that  
>>>>>affects the results of some tests (though not basic  
>>>>>summing) if not taken into account, but when taken into account, they  
>>> work  
>>>>>  
>>>>>exactly the same way).  
>>>>>  
>>>>>So at least when talking about apps with 32-bit float all the way  
>>>>>through,  
>>>>>  
>>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>>>  
>>>>>unless  
>>>>>there is an error somewhere, or variation in how the user duplicates  
>the  
>>>>>  
>>>>>same mix in two different apps.  
>>>>>  
>>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>>  
>>>>>basis for recording and mixing from which users can make all  
>>>>>of the decisions as to how the final product will sound and not be  
>>>>>required  
>>>>>  
>>>>>to decide when purchasing a pricey console, and have to  
>>>>>focus their business on clients who want "that sound". I believe we  
>are  
>>>>>  
>>>>>actually closer to the pure definition of recording now than  
>>>>>we once were.  
>>>>>  
>>>>>Regards,  
>>>>>Dedric  
>>>>>

>>>>>  
>>>>>  
>>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>>> un-cover  
>>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>>> Steinberg  
>>>>>> and so on..  
>>>>>>  
>>>>>> What's under the hood. To me and others,when Digi re-coded their  
  
>>>>>> summing  
>>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>>  
>>>>>> bump.  
>>>>>> Where as Steinberg's summing is very neutral.  
>>>>>>  
>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>Hi Neil,  
>>>>>>>  
>>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>>through  
>>>>>>>  
>>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>>conclusion - easy to do given how confusing digital audio can be.  
>  
>>>>>>>Each  
>>>>>>> word  
>>>>>>>represents an amplitude  
>>>>>>>point on a single curve that is changing over time, and can vary  
with  
>>>>> a  
>>>>>>>  
>>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>>modulation  
>>>>>>> of  
>>>>>>>a single waveform,  
>>>>>>>that over a small amount of time creates the sound we translate -  
>we  
>>  
>>>>>>>don't  
>>>>>>>  
>>>>>>>really hear a single sample at a time,  
>>>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>>>represent  
>>>>>>> a  
>>>>>>>single positive or negative peak  
>>>>>>>of a 22,050Hz waveform).

>>>>>>>  
>>>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
>>>>> 24,  
>>>>>>>  
>>>>>>>you may hear, and will see that easily,  
>>>>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>>>>audible  
>>>>>>>  
>>>>>>>the difference.  
>>>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>>>>>>  
>>>>>>>that  
>>>>>>>  
>>>>>>>bit's impact will be  
>>>>>>>if there is a variation.  
>>>>>>>  
>>>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>>>>> then  
>>>>>>>  
>>>>>>>it simply be a  
>>>>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>>>>obvious  
>>>>>>>  
>>>>>>>musical difference, but that should never  
>>>>>>>happen in a phase cancellation test between identical files higher  
>  
>>>>>>>than  
>>>>>>> bit  
>>>>>>>24, unless there are clock sync problems,  
>>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>>  
>>>>>>>By definition of what DAWs do during playback and record, every audio  
>>>>>>>  
>>>>>>>stream  
>>>>>>>  
>>>>>>>has the same point in time (judged by the timeline)  
>>>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>>>>>  
>>>>>>>rate  
>>>>>>>  
>>>>>>>we are using. A phase cancellation test uses that  
>>>>>>>fact to compare two audio files word for word (and hence bit for  
bit  
>>>>>>>  
>>>>>>>since  
>>>>>>>  
>>>>>>>each bit of a 24-bit word would  
>>>>>>>be at the same bit slot in each 24-bit word). Assuming they are

>>>>>>>aligned  
>>>>>>> to  
>>>>>>>the same start point, sample  
>>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>>point,  
>>>>>>>  
>>>>>>>bit for bit, and one is phase inverted,  
>>>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>>>completely  
>>>>>>>  
>>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>>must be the exact opposite of that same bit position in a word at  
>the  
>>>>> same  
>>>>>>>  
>>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>>of the full difference file is valuable as it can show any differences  
>>>>>>> in  
>>>>>>>  
>>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>>there is no audible difference, the visual followup will show if  
>the  
>>> two  
>>>>>>>  
>>>>>>>files truly cancel even a levels below hearing, or  
>>>>>>>outside of a frequency change that we will perceive.  
>>>>>>>  
>>>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>>thousands of samples. From a musical standpoint this is usually  
>in  
>>>> a  
>>>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>>>show up as the difference between them, and that usually happens  
>due  
>>>> to  
>>>>>>> some  
>>>>>>>form of processing difference between the files,  
>>>>>>>such as EQ, compression, frequency dependant gain changes, etc. That  
>>>> is  
>>>>>>> what  
>>>>>>>>I believe you are thinking through, but when  
>>>>>>>>talking about straight summing with no gain change (or known equal  
>  
>>>>>>>>gain  
>>>>>>>>  
>>>>>>>>changes), we are only looking at linear, one for one

>>>>>>>comparisons between the two files' frequency representations.  
>>>>>>>  
>>>>>>>Regards,  
>>>>>>>Dedric  
>>>>>>>  
>>>>>>> Neil wrote:  
>>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
>>> the  
>>>>>>>  
>>>>>>>>> last  
>>>>>>>>>  
>>>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>>>> quantization noise, which by technical rights, is considered  
below  
>>>>> the  
>>>>>>>  
>>>>>>>>> level  
>>>>>>>>>  
>>>>>>>>> of "cancellation" in such tests.  
>>>>>>>>>  
>>>>>>>>> I'm not necessarily talking about just the first bit or the  
>>>>>>>>> last bit, but also everything in between... what happens on bit  
>>>>>>>>> #12, for example? Everything on bit #12 should be audible, but  
>>>>>>>>> in an a/b test what if there are differences in what bits #8  
>>>>>>>>> through #12 sound like, but the amplitude is still the same on  
>>>>>>>>> both files at that point, you'll get a null, right? Extrapolate  
>>>>>>>>> that out somewhat & let's say there are differences in bits #8  
>>>>>>>>> through #12 on sample points 3, 17, 1,000, 4,523, 7,560, etc,  
>>>>>>>>> etc through 43,972... Now this is breaking things down well  
>>>>>>>>> beyond what I think can be measured, if I'm not mistaken (I  
>>>>>>>>> don't know of any way we could extract JUST that information  
>>>>>>>>> from each file & play it back for an a/b test; but would not  
>>>>>>>>> that be enough to have to "null-able" files that do actually  
>>>>>>>>> sound somewhat different?  
>>>>>>>>>  
>>>>>>>>> I guess what I'm saying is that since each sample in a musical  
>>>>>>>>> track or full song file doesn't represent a pure, simple set of  
>>>>>>>>> content like a sample of a sine wave would - there's a whole  
>>>>>>>>> world of harmonic structure in each sample of a song file, and  
>>>>>>>>> I think (although I'll admit - I can't "prove") that there is  
>>>>>>>>> plenty of room for some variables between the first bit & the  
>>>>>>>>> last bit while still allowing for a null test to be successful.  
>>>>>>>>>  
>>>>>>>>> No? Am I wacked out of my mind?  
>>>>>>>>>  
>>>>>>>>> Neil  
>>>>>>>>>



>>  
>>For reference, everytime I open Sequoia I think I might hear a broader,  
>  
>>clean,  
>>and almost flat (spectrum, not depth) sound, but I don't - it's the same  
>as  
>>Nuendo, fwiw.  
>>Also I don't think what I was referring to was a theory from Chuck - I  
>  
>>believe that was what he  
>>discovered in the code.  
>>  
>>Digital mixers all have different preamps and converters. Unless you are  
>  
>>bypassing every  
>>EQ and converter and going digital in and out to the same converter when  
>  
>>comparing, it would be hard  
>>to say the mix engine itself sounds different than another mixer, but taken  
>  
>>as a whole, then  
>>certainly they may very well sound different. In addition, hardware digital  
>>mixers may use a variety of different paths between the I/O, channel  
>>processing, and summing,  
>>though most are pretty much software mixers on a single chip or set of  
dsps  
>  
>>similar to ProTools,  
>>with I/O and a hardware surface attached.  
>>  
>>I know it may be hard to separate the mix engine as software in either  
a  
>  
>>native DAW  
>>or a digital mixer, from the hardware that translates the audio to something  
>  
>>we hear,  
>>but that's what is required when comparing summing. The hardware can  
>>significantly change  
>>what we hear, so comparing digital mixers really isn't of as much interest  
>  
>>as comparing native  
>>DAWs in that respect - unless you are looking to buy one of course.  
>>  
>>Even though I know you think manufacturers are trying to add something  
to  
>  
>>give them an edge, I am 100%

>>sure that isn't the case - rather they are trying to add or change as little  
>  
>>as possible in order to give  
>>them the edge. Their end of digital audio isn't about recreating the past,  
>  
>>but improving upon it.  
>>As we've discussed and agreed before, the obsession with recreating  
>>"vintage" technology is as much  
>>fad as it is a valuable creative asset. There is no reason we shouldn't  
>  
>>have far superior hardware and software EQs and comps  
>>than 20, 30 or 40 years ago. No reason at all, other than market demand,  
>  
>>but the majority of software, and new  
>>hardware gear on the market has a vintage marketing tagline with it.  
>>Companies will sell any bill of  
>>goods if customers will buy it.  
>>  
>>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>>or Sonar, and it's pretty safe to include Logic and DP in that list as  
well.  
>  
>>One of the reasons I test  
>>these things is to be sure my DAW isn't doing something wrong, or something  
>  
>>I don't know about.  
>>  
>>Vegas - I use it for video conversions and have never done any critical  
>  
>>listening tests with it. What I have heard  
>>briefly didn't sound any different. It certainly looks plain vanilla  
>>though. What you are describing is exactly  
>>what I would say about the GUIs of each of those apps, not that it means  
>  
>>anything. Just interesting.  
>>  
>>That's one reason I listen eyes closed and double check with phase  
>>cancellation tests and FFTs - I am  
>>influenced creatively by the GUI to some degree. I actually like Cubase  
>4's  
>>GUI better than Nuendo 3.2,  
>>though there are only slight visual differences (some workflow differences  
>  
>>are a definite improvement for me though).  
>>  
>>ProTools' GUI always made me want to write one dimensional soundtracks  
in  
>



>>mono for public utilities, accounting offices  
>>or the IRS while reading my discreet systems analysis textbook - it was  
>also  
>>grey. ;-)  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>>  
>>> Dedric, my simple test is simple..  
>>> Using the same audio interface, with the same stereo file..null-ed to  
>  
>>> zero..No  
>>> eq, for fx. Master fader on zero..  
>>>  
>>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that  
>|  
>>> have  
>>> referenced before.. The sound coming from PT-M has a nice top end , where  
>>> as Neundo has a nice flatter sound quality.  
>>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>>  
>>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
>  
>>> the  
>>> 192 interface.  
>>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>>  
>>> Somethings going on.  
>>>  
>>> Chucks post about how paris handles audio is a theory..Only Edmund can  
>  
>>> truly  
>>> give us the goods on what's really what..  
>>>  
>>> I disagree that manufactuers don;t set out o put a sonic print on their  
>  
>>> products.  
>>> I think they do.  
>>>  
>>> I have been fortunate to work on some digital mixers and I can tell you  
>  
>>> that  
>>> each one has their own sound. The Sony Dmx-100 was modeled after SSL  
4000g  
>>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
>warm

>>> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
>>> Dm2000(version 1.x) which has a very Clean, neutral sound..However, some  
>>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
>  
>>> which  
>>> added Vintage type Eq's, modeled analog input gain saturation fx too  
give  
>>> the user a choice Btw Clean and Neutral vs sonic Character.  
>>>  
>>> So, if digital conoles can be given a sonic character, why not a software  
>>> mixer?  
>>> The truth is, there are some folks who want a neutral mixer and then  
there  
>>> are others who want a sonic footprint imparted. and these can be coded  
>in  
>>> the digital realm.  
>>> The appllies with the manufactuers. They too have their vision on what  
>They  
>>> think and want their product to sound.  
>>>  
>>> I love reading on gearslutz the posts from Plugin developers and their  
>  
>>> interpretations  
>>> and opinions about what makes their Neve 1073 Eq better and what goes  
>into  
>>> making their version sound like it does.. Each Developer has a different  
>>> vision as to what the Neve 1073 should sound like. And yet they all sound  
>>> good , but slightly different.  
>>>  
>>> You stated that you use Vegas. Well as you know, Vegas has a very generic  
>>> sound..Just plain and simple. But, i bet you can tell the difference  
>on  
>>> your system when you play that same file in Neundo (No, fx, eq,  
>>> null-edzerro)..  
>>> ???  
>>>  
>>>  
>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>Lamont - what is the output chain you are using for each app when  
>>>>comparing  
>>>  
>>>>the file in Nuendo  
>>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?  
>>>>Since these can't use the same output driver, you would have to depend  
>on  
>>>  
>>>>the D/A being  
>>>>the same, but clocking will be different unless you have a master clock,

>>> and  
>>>>both interfaces  
>>>>are locking with the same accuracy. This was one of the issues that  
>>>>came  
>>> up  
>>>>at Lynn Fuston's  
>>>>D/A converter shootout - when do you lock to external clock and incur  
>>>>the  
>>>>  
>>>>resulting jitter,  
>>>>and when do you trust the internal clock - and if you do lock externally,  
>>>>  
>>>>how good is the PLL  
>>>>in the slave device? These issues can cause audible changes in the top  
>>> end  
>>>>that have nothing to do  
>>>>with the software itself. If you say that PTHD through the same converter  
>>>>  
>>>>output as Nuendo (via? RME?  
>>>>Lynx?) using the same master clock, sounds different playing a single  
>>>>  
>>>>audio  
>>>>  
>>>>file, then I take your word  
>>>>for it. I can't tell you why that is happening - only that an audible  
>>>>difference really shouldn't happen due  
>>>>to the software alone - not with a single audio file, esp. since I've  
>>>>  
>>>>heard  
>>>>  
>>>>and seen PTHD audio cancel with  
>>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
>>>>to  
>>> the  
>>>>output driver should  
>>>>be, and usually is, completely transparent, bit for bit.  
>>>>  
>>>>The same audio file played through the same converters should only sound  
>>>>  
>>>>different if something in  
>>>>the chain is different - be it clocking, gain or some degree of  
>>>>unintended,  
>>>>  
>>>>errant dsp processing. Every DAW should  
>>>>pass a single audio file without altering a single bit. That's a basic  
>>>>  
>>>>level  
>>>>

>>>>of accuracy we should always  
>>>>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
>>>  
>>>>mix will be altered in ways you  
>>>>didn't intend, even though you would end up mixing with that factor in  
>  
>>>>place  
>>>  
>>>>(e.g. you still mix for what  
>>>>you want to hear regardless of what the platform does to each audio track  
>>> or  
>>>>channel).  
>>>>  
>>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>>lightpipe to another DAW, record it  
>>>>bring the recorded file back in, line them up to the first bit, and have  
>>>  
>>>>them cancel on and inverted phase  
>>>>test. I did this with Nuendo and Cubase 4 on separate machines just  
to  
>>> be  
>>>>sure my master clocking and  
>>>>slave sync was accurate - it worked perfectly.  
>>>>  
>>>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>>> the  
>>>>two. There shouldn't  
>>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>>different  
>>>  
>>>>pan law? Shouldn't make a  
>>>>difference even if comparing two mono panned files to their stereo  
>>>>interleaved equivalent, but for sake  
>>>>of completeness it's worth checking as well. A variation in the output  
>>>  
>>>>chain, be it drivers, audio card  
>>>>card, or converters would be the most likely culprit here.  
>>>>  
>>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>>intentionally is that the  
>>>>ultimate goal from day one with recording has been to accurately reproduce  
>>>  
>>>>what we hear.  
>>>>We developed a musical penchant for sonic character because the hardware  
>>>  
>>>>just wasn't accurate,  
>>>>and what it did often sent us down new creative paths - even if by force  
>>> -

>>>>and we decided it was  
>>>>preferred that way.  
>>>>  
>>>>Your point about what goes into the feature presets to sell synths is  
>  
>>>>right  
>>>  
>>>>for sure, but synths are about  
>>>>character and getting that "perfect piano" or crystal clear bell pad,  
>or  
>>> fat  
>>>>punchy bass without spending  
>>>>a mint on development, adding 50G onboard sample libraries, or costing  
>  
>>>>\$15k,  
>>>  
>>>>so what they  
>>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>>> on  
>>>>the output. That's been the case  
>>>>for years, at least since we had effects on synths at least. But even  
>  
>>>>with  
>>>  
>>>>modern synths such as the Fantom,  
>>>>Tritons, etc, which are great synths all around, of course the coolest,  
>>>  
>>>>widest and biggest patches  
>>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>>  
>>>>reverbs, chorus, etc. The best  
>>>>way to find out if a synth is really good is to bypass all effects and  
>see  
>>>  
>>>>what happens. Most are pretty  
>>>>good these days, but about half the time, there are presets that fall  
>>>>completely flat in fx bypass.  
>>>>  
>>>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>>>  
>>>>are - they are designed  
>>>>to \*not\* add anything - to pass through what we create as users, with  
>no  
>>>  
>>>>alteration (or as little as possible)  
>>>>beyond what we add with intentional processing (EQ, comps, etc).  
>>>>Developers  
>>>

>>>>would find no pride  
>>>>in hearing that their DAW sounds anything different than whatever is  
being  
>>>  
>>>>played back in it,  
>>>>and the concept is contrary to what AES and IEEE proceedings on the issue  
>>>  
>>>>propose in general  
>>>>digital audio discussions, white papers, etc.  
>>>>  
>>>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>>>  
>>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>>is drop the track gain by 20dB or so, then added it back at the master  
>  
>>>>buss  
>>>  
>>>>to create the effect of headroom (probably  
>>>>because the master buss is really summing on the card, and they have  
more  
>>>  
>>>>headroom there than on the tracks  
>>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>>  
>>>>float files to the EDS card, but sort of  
>>>>doubt it. I think Chuck has clarified this at one point, but don't recall  
>>>  
>>>>the answer.  
>>>>  
>>>>Also what Paris did is use a greater bit depth on the hardware than  
>>>>ProTools  
>>>  
>>>>did - at the time PT was just  
>>>>bring Mix+ systems to market, or they had been out for a year or two  
(if  
>>> I  
>>>>have my timeline right) - they  
>>>>were 24-bit fixed all the way through. Logic and Cubase were native  
DAWs,  
>>>  
>>>>but native was still too slow  
>>>>to compete with hardware hybrids. Paris trumped them all by running  
  
>>>>32-bit  
>>>  
>>>>float natively (not new really, but  
>>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
>of

>>>  
>>>>going to Motorola DSPs at 24.  
>>>>The onboard effects were also a step up from anything out there, so the  
>>> demo  
>>>>did sound good.  
>>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>>sloppy production and  
>>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>>  
>>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>>> no  
>>>>one else had. With very nice  
>>>>onboard effects, Paris jumped ahead of anything else out there easily,  
>and  
>>>  
>>>>still respectably holds its' own today  
>>>>in that department.  
>>>>  
>>>>Most demos I hear (when I listen to them) vary in quality, usually not  
>so  
>>>  
>>>>great in some area. But if a demo does  
>>>>sound great, then it at least says that the product is capable of at  
>  
>>>>least  
>>>  
>>>>that level of performance, and it can  
>>>>only help improve a prospective buyer's impression of it.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>>  
>>>>> Dedric good post..  
>>>>>  
>>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and  
>it  
>>>  
>>>>> has  
>>>>> that same sound (no eq, zero fader) that HD does. I know their use  
the  
>>>  
>>>>> same  
>>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>>> fader)..results.  
>>>>> different sonic character.  
>>>>>

>>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm  
>just  
>>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>>> ..zilch..nada..  
>>>>>  
>>>>> Now, there are devices (keyboards, dum machines) on the market today  
>  
>>>>> that  
>>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>>  
>>>>> up.  
>>>>> Why? because it gives their product an competitive advantageover the  
>>>>> competition..  
>>>>> Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>>  
>>>>> So, why would'nt a DAW manufactuer code in an extra (oommf) to make  
>  
>>>>> their  
>>>>> DAW sound better. Especially, given the "I hate Digtal Summing" crowd?  
>>>  
>>>>> And,  
>>>>> If I'm a DAW manufactuer, what would give my product a sonic edge over  
>>> the  
>>>>> competition?  
>>>>>  
>>>>> We live in the "louder is better" audio world these days, so a DAW  
that  
>>>  
>>>>> can  
>>>>> catch my attention 'sonically" will probaly will get the sell. That's  
>>> what  
>>>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
>>> to  
>>>>> this day, nothing has floored me like that "Road House Blues Demo"  
I  
>  
>>>>> heard  
>>>>> on Paris.  
>>>>>  
>>>>> Was it the hardware ? was it the software. I remember talking with  
  
>>>>> Edmund  
>>>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>>>> reproduce  
>>>>> the sonics of big buck analog board (eq's) and all.. And, summing was  
>>> a  
>>>>> big  
>>>>> big issue for them because they (ID) thought that nobody has gotten



>>>> it(summing)  
>>>> right. And by right, they meant, behaved like a console with a wide  
>lane  
>>>> for all of those tracks..  
>>>>  
>>>>  
>>>>  
>>>>  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>news:458be8d5\$1@linux...  
>>>>>>  
>>>>>> Okay...  
>>>>>> I guess what I'm saying is this:  
>>>>>>  
>>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>>> differently  
>>>>>> for sound results.  
>>>>>>  
>>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>>specific  
>>>>>>  
>>>>>>sound shaping purpose  
>>>>>>beyond normal summing/mixing. Users talk about wanting developers  
to  
>>> add  
>>>>> a  
>>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>>but that's really impractical given the amount of dsp required to make  
>>>> a  
>>>>>>  
>>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>>etc). For sake of not eating up all cpu processing, that could likely  
>>>>  
>>>>>>only  
>>>>>>  
>>>>>>surface as is a built in EQ, which  
>>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>>  
>>>>>>So it hasn't happened yet and isn't likely to as it detours from the  
>  
>>>>>>basic  
>>>>>>  
>>>>>>tenant of audio recording - recreate what comes in as  
>>>>>>accurately as possible.  
>>>>>>  
>>>>>>What Digi did in recoding their summing engine was try to recover some  
>>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k

dsps  
>>>> are  
>>>>>24-bit fixed point chips and I think  
>>>>>the new generation (321?) still is, but they use double words now for  
>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>>> the  
>>>>>  
>>>>>buss  
>>>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>>>>  
>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
>  
>>>>>mixer  
>>>>> to  
>>>>>prevent this  
>>>>>constant truncation of data. 24-bits isn't enough to cover summing  
>for  
>>>>> more  
>>>>>than a few tracks without  
>>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>>information will be lost, at least at the lowest levels.  
>>>>>  
>>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>>  
>>>>>implement a 48-bit double word stage as well),  
>>>>>simply smoothed over the truncation that was happening, but it didn't  
>>>  
>>>>>solve  
>>>>>  
>>>>>the problem, so with HD  
>>>>>they went to a double-word path - throughout I believe, including the  
>>> path  
>>>>>  
>>>>>between chips. I believe the chips  
>>>>>are still 24-bit, but by doubling up the processing (yes at a cost  
>of  
>>>  
>>>>>twice  
>>>>>  
>>>>>the overhead), they get a 48-bit engine.  
>>>>>This not only provided better headroom, but greater resolution. Higher  
>>>>> bit  
>>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>>really where we get the definition of dynamic range - by lowering the  
>>>  
>>>>>signal

>>>>>to quantization noise ratio.  
>>>>>With DAWs that use 32-bit floating point math all the way through,  
the  
>>>>>only  
>>>>>reason for altering the summing  
>>>>>is by error, and that's an error that would actually be hard to make  
>and  
>>>>> get  
>>>>>past a very basic alpha stage of testing.  
>>>>>There is a small difference in fixed point math and floating point  
math,  
>>>>> or  
>>>>>at least a theoretical difference in how it affects audio  
>>>>>in certain cases, but not necessarily in the result for calculating  
>gain  
>>>>> in  
>>>>>either for the same audio file. Where any differences might show up  
>is  
>>>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>>there are any differences in where each amplitude level is quantized.  
>>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>>depths  
>>>>>throughout a single summing path to accomodate hardware  
>>>>>as well as software summing, since there may be truncation or rounding  
>>>>>along  
>>>>>the way, but that impacts the lowest bit  
>>>>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>>>>"depth",  
>>>>>not the levels most music so the differences are most  
>>>>>often more subtle than not. But most modern DAWs have eliminated those  
>>>>>"rough edges" in the math by increasing the bit depth to accomodate  
>>>>>normal  
>>>>>summing required for mixing audio.  
>>>>>

>>>>> So with Lynn's unity gain summing test (A files on the CD I believe),  
>>> DAWs  
>>>>>  
>>>>> were never asked to sum beyond 24-bits,  
>>>>> at least not on the upper end of the dynamic range, so everything that  
>>>  
>>>>> could  
>>>>>  
>>>>> represent 24-bits accurately would cancel. The only ones  
>>>>> that didn't were ones that had a different bit depth and/or gain  
>>>>> structure  
>>>>>  
>>>>> whether hybrid or native  
>>>>> (e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>>> In  
>>>>>  
>>>>> this case, PTHD cancelled (when I tested it) with  
>>>>> Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>>> vs.  
>>>>>  
>>>>> 32-bit float wasn't a factor.  
>>>>>  
>>>>> When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>>  
>>>>> Sequoia and Sonar cancel - both audibly and  
>>>>> visually at inaudible levels, which only proves that one isn't making  
>>> an  
>>>>>  
>>>>> error when calculating basic gain. Since a dB is well defined,  
>>>>> and the math to add gain is simple, they shouldn't. The fact that  
they  
>>>>> all  
>>>>> use 32-bit float all the way through eliminates a difference  
>>>>> in data structure as well, and this just verifies that. There was  
a  
>  
>>>>> time  
>>>>>  
>>>>> that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor  
went,  
>>>>> but it's 32-bit float all the way through now just as Sonar,  
>>>>> Nuendo/Cubase,  
>>>>>  
>>>>> Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>> I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>>> but  
>>>>> I don't know if it is still 24-bit, or now 48 bit.  
>>>>> That was an intentional choice by the developer, but he's the only

one  
>>> I  
>>>>>  
>>>>>know of that stuck with 24-bit for summing  
>>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>>  
>>>>>Long answer, but to sum up, it is certainly physically \*possible\* for  
>>> a  
>>>>>  
>>>>>developer to code something differently intentionally, but not  
>>>>>in reality likely since it would be breaking some basic fixed point  
>or  
>>>>>floating point math rules. Where the differences really  
>>>>>showed up in the past is with PT Mix systems where the limitation was  
>>>  
>>>>>really  
>>>>>  
>>>>>significant - e.g. 24 bit with truncation at several stages.  
>>>>>  
>>>>>That really isn't such an issue anymore. Given the differences in  
>>>>>workflow,  
>>>>>  
>>>>>missing something in workflow or layout differences  
>>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the  
way  
>>>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>>>not software busses, so in Sonar, busses are actually outputs, and  
sub  
>>>>>busses are actually busses in Nuendo. There are no,  
>>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
>>> -  
>>>>> that  
>>>>>affects the results of some tests (though not basic  
>>>>>summing) if not taken into account, but when taken into account, they  
>>> work  
>>>>>  
>>>>>exactly the same way).  
>>>>>  
>>>>>So at least when talking about apps with 32-bit float all the way  
>>>>>through,  
>>>>>  
>>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>>>  
>>>>>unless  
>>>>>there is an error somewhere, or variation in how the user duplicates  
>the  
>>>>>  
>>>>>same mix in two different apps.

>>>>>  
>>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>>  
>>>>>basis for recording and mixing from which users can make all  
>>>>>of the decisions as to how the final product will sound and not be  
>>>>>required  
>>>>>  
>>>>>to decide when purchasing a pricey console, and have to  
>>>>>focus their business on clients who want "that sound". I believe we  
>are  
>>>>>  
>>>>>actually closer to the pure definition of recording now than  
>>>>>we once were.  
>>>>>  
>>>>>Regards,  
>>>>>Dedric  
>>>>>  
>>>>>  
>>>>>  
>>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>>> un-cover  
>>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>>> Steinberg  
>>>>>> and so on..  
>>>>>>  
>>>>>> What's under the hood. To me and others,when Digi re-coded their  
  
>>>>>> summing  
>>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>>  
>>>>>> bump.  
>>>>>> Where as Steinberg's summing is very neutral.  
>>>>>>  
>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>Hi Neil,  
>>>>>>>  
>>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>>through  
>>>>>>>  
>>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>>conclusion - easy to do given how confusing digital audio can be.  
>  
>>>>>>>Each  
>>>>>>> word  
>>>>>>>represents an amplitude  
>>>>>>>point on a single curve that is changing over time, and can vary  
with  
>>>>> a

>>>>>>  
>>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>>modulation  
>>>>>>> of  
>>>>>>>a single waveform,  
>>>>>>>that over a small amount of time creates the sound we translate -  
>we  
>>>  
>>>>>>>don't  
>>>>>>>  
>>>>>>>really hear a single sample at a time,  
>>>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>>>represent  
>>>>>>> a  
>>>>>>>single positive or negative peak  
>>>>>>>of a 22,050Hz waveform).  
>>>>>>>  
>>>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
>>>>> 24,  
>>>>>>>  
>>>>>>>you may hear, and will see that easily,  
>>>>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>>>>audible  
>>>>>>>  
>>>>>>>the difference.  
>>>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>>>>  
>>>>>>>that  
>>>>>>>  
>>>>>>>bit's impact will be  
>>>>>>>if there is a variation.  
>>>>>>>  
>>>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>>>>> then  
>>>>>>>  
>>>>>>>it simply be a  
>>>>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>>>>obvious  
>>>>>>>  
>>>>>>>musical difference, but that should never  
>>>>>>>happen in a phase cancellation test between identical files higher  
>  
>>>>>>>than  
>>>>>>> bit  
>>>>>>>24, unless there are clock sync problems,  
>>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>>

>>>>>>>By definition of what DAWs do during playback and record, every audio  
>>>>>  
>>>>>>>stream  
>>>>>>>  
>>>>>>>has the same point in time (judged by the timeline)  
>>>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>>>>>  
>>>>>>>rate  
>>>>>>>  
>>>>>>>we are using. A phase cancellation test uses that  
>>>>>>>fact to compare two audio files word for word (and hence bit for  
bit  
>>>  
>>>>>>>since  
>>>>>>>  
>>>>>>>each bit of a 24-bit word would  
>>>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
  
>>>>>>>aligned  
>>>>>>> to  
>>>>>>>the same start point, sample  
>>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>>point,  
>>>>>>>  
>>>>>>>bit for bit, and one is phase inverted,  
>>>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>>>completely  
>>>>>>>  
>>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>>must be the exact opposite of that same bit position in a word at  
>the  
>>>>> same  
>>>>>>>  
>>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>>of the full difference file is valuable as it can show any differences  
>>>>> in  
>>>>>>>  
>>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>>there is no audible difference, the visual followup will show if  
the  
>>> two  
>>>>>>>  
>>>>>>>files truly cancel even a levels below hearing, or  
>>>>>>>outside of a frequency change that we will perceive.  
>>>>>>>  
>>>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>>thousands of samples. From a musical standpoint this is usually



in  
>>> a  
>>>>>>> frequency range (low freq, or high freq most often) - that will  
>>>>>>> show up as the difference between them, and that usually happens  
due  
>>> to  
>>>>>>> some  
>>>>>>> form of processing difference between the files,  
>>>>>>> such as EQ, compression, frequency dependant gain changes, etc. That  
>>> is  
>>>>>>> what  
>>>>>>> I believe you are thinking through, but when  
>>>>>>> talking about straight summing with no gain change (or known equal  
>  
>>>>>>> gain  
>>>>>>>  
>>>>>>> changes), we are only looking at linear, one for one  
>>>>>>> comparisons between the two files' frequency representations.  
>>>>>>>  
>>>>>>> Regards,  
>>>>>>> Dedic  
>>>>>>>  
>>>>>>> Neil wrote:  
>>>>>>>> "Dedic Terry" <dedric@echomg.com> wrote:  
>>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
>>> the  
>>>>>>>  
>>>>>>>>> last  
>>>>>>>>>  
>>>>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>>>>> quantization noise, which by technical rights, is considered  
below  
>>>>> the  
>>>>>>>  
>>>>>>>>>> level  
>>>>>>>>>>  
>>>>>>>>>>> of "cancellation" in such tests.  
>>>>>>>>>>>  
>>>>>>>>>>>>> I'm not necessarily talking about just the first bit or the  
>>>>>>>>>>>>> last bit, but also everything in between... what happens on bit  
>>>>>>>>>>>>> #12, for example? Everything on bit #12 should be audible, but  
>>>>>>>>>>>>> in an a/b test what if there are differences in what bits #8  
>>>>>>>>>>>>> through #12 sound like, but the amplitude is still the same on  
>>>>>>>>>>>>> both files at that point, you'll get a null, right? Extrapolate  
>>>>>>>>>>>>> that out somewhat & let's say there are differences in bits #8  
>>>>>>>>>>>>> through #12 on sample points 3, 17, 1,000, 4,523, 7,560, etc,  
>>>>>>>>>>>>> etc through 43,972... Now this is breaking things down well  
>>>>>>>>>>>>> beyond what I think can be measured, if I'm not mistaken (I



"Dedric Terry" <dterry@keyofd.net> wrote:

>  
>I was part of that thread (kdm) and did those tests - I actually took them  
>a step further than Jake or Fredo. As you can see I incorrectly thought  
>there was something in the group summing process, but it was just my boneheaded  
>interpretation of output data (using a small sample section for FFT rather  
>than the full file mainly). :-(  
>  
>What Fredo is talking about is when you go over 0dBFS what happens to the  
>"over" data, and the references to truncation are in that case, which isn't  
>normal for mixing. This is the same decision every native DAW developer  
>has to make.  
>  
>We were actually discussing what happens when you sum to a group vs. summing  
>to the main bus, without overs. I did my test with all files summing to  
>-20dB, so there was no chance of pushing the upper limits of 32-bit float's  
>truncation back down to 24-bits. And I actually simplified it by using  
two  
>copies of the same file (just as Fredo did), one phase inverted, both sample  
>aligned. They cancelled to below 24 bits just as expected, and just as  
they  
>should. The variations below 24 bits that I saw (and thought were above  
>24-bits at one point) are correlation of lower frequencies when gain and  
>equivalent reduction are introduced (which is what Chuck stated that Paris  
>does up front on every track). That really doesn't impact the audio itself  
>since data below -136dB is quantization noise for 24-bit audio.  
>  
>Sonar, Nuendo, Cubase 4 and Sequoia all behaved exactly the same way in  
this  
>test - which tells me they are handling the LSB's the same way. When data  
>is summed to groups, there will be quantization noise below -136dB. This  
>is completely normal for any native DAW and they all are subject to it.  
  
>As you might read in the thread my conclusion was that we proved digital  
>audio theory exists - e.g. no uncharted territory, no digital audio frontiers,  
>no bugs in Nuendo. yeeha. But that's what I get for second guessing talented  
>developers. ;-)  
>  
>Fwiw, to take it a step further, Samplitude/Sequoia and Nuendo handle overs,  
>or "into the red" identically. I checked that too a while back after the  
>reports of extra headroom, etc in Samplitude. Believe me, I've tried hard  
>to find where any differences might appear, not just noticeable differences,  
>but any differences at the lowest levels, but it seems the major native  
DAW  
>players are making the same decisions when it comes to truncation, etc,  
and  
>there really aren't that many to make. In my tests, dither really wasn't

>an issue (I turned it off in all DAWs I tested just to test with pure truncation).  
>  
>Regards,  
>Dedric  
>  
>"LaMONT" <jjdpro@ameritech.net> wrote:  
>>  
>>Dedric, check out this post from our dear friend Fredo: Neundo Moderator:  
>>Explaining how Steingberg's audio engine works. Note the trade-offs..Meaning,  
>>Steinberg's way of coding an audio-engine 32bit float is different than  
>say  
>>Magix Samplitude:  
>>  
>>Fredo  
>>Administrative Moderator  
>>  
>>  
>>Joined: 29 Dec 2004  
>>Posts: 4213  
>>Location: Belgium  
>> Posted: Fri Dec 08, 2006 2:33 pm Post subject:  
>>  
>> -----  
>>  
>>I think I see where the problem is.  
>>In my scenario's I don't have any track that goes over 0dBfs, but I have  
>>always lowered one channel to compensate with another.  
>>So, I never went over the 0dB fs limit.  
>>  
>>Here's the explanation:  
>>  
>>As soon as you go over 0dB, technically you are entering the domain of  
distortion.  
>>  
>>In a 32bit FP mixer, that is not the case since there is unlimited headroom.  
>>  
>>  
>>Now follow me step by step please - read this slow and make sure you understand  
>>-  
>>  
>>At the end of each "stage", there is an adder (a big calculator) which  
adds  
>>all the numbers from the individual tracks that are routed to this "adder".  
>>  
>>The numbers are kept in the 80-bit registers and then brought back to 32bit  
>>float.  
>>This process of bringing back the numbers from 80-bit (and more) to 32bit  
>>is kept to an absolute minimum.

>>This adding/bringing back to 32bit is done at 3 places: After a plugin slot  
>>(VST-specs for all plugin manufacturers) - Group Tracks and Master Tracks.  
>>  
>>  
>>Now, as soon as you boost the volume above 0dB, you get more than 32bits.  
>>Stay below 0dB and you will stay below 32 bits.  
>>When the adders dump their results, the numbers are brought back from any  
>>number of bits (say 60bit) to 32 bit float.  
>>These numbers are simply truncated which results in distortion; that's the  
>>noise/residue you find way down low.  
>>There is an algorithm that protects us from additive errors - so these  
>errors  
>>can never come into the audible range.  
>>So, as soon as you go over 0dB, you will see these kind of artifacts.  
>>  
>>It is debatable if this needs to be dithered or not. The problem -still  
>is-  
>>that it is very difficult to dither in a Floating Point environment.  
>>Fact remains that the error shouldn't be bigger than 2 to 3 LSB's.  
>>  
>>Is this a problem?  
>>In real world applications: NO.  
>>In scientific -unrealistic- tests (forcing the error ): YES.  
>>  
>>The alternative is having a Fixed point mixer, where you already would be  
>>in trouble as soon as you boost one channel over 0dBfs. (or merge two files  
>>that are @ 0dB)  
>>Also, this problem will be pretty much gone as soon as we switch to the  
>64  
>>bit engine.  
>>  
>>  
>>For the record, the test where Jake hears "music" as residue must be flawed.  
>>You should hear noise/distortion from square waves.  
>>  
>>HTH  
>>  
>>Fredo  
>>  
>>  
>>  
>>  
>>  
>>"Dedric Terry" <dedric@echomg.com> wrote:  
>>>I can't tell you why you hear ProTools differently than Nuendo using a

>  
>>>single file.  
>>>There isn't any voodoo in the software, or hidden character enhancing dsp.  
>>  
>>>I'll see if  
>>>I can round up an M-Powered system to compare with next month.  
>>>  
>>>For reference, everytime I open Sequoia I think I might hear a broader,  
>>  
>>>clean,  
>>>and almost flat (spectrum, not depth) sound, but I don't - it's the same  
>>as  
>>>Nuendo, fwiw.  
>>>Also I don't think what I was referring to was a theory from Chuck -  
I  
>>  
>>>believe that was what he  
>>>discovered in the code.  
>>>  
>>>Digital mixers all have different preamps and converters. Unless you  
are  
>>  
>>>bypassing every  
>>>EQ and converter and going digital in and out to the same converter when  
>>  
>>>comparing, it would be hard  
>>>to say the mix engine itself sounds different than another mixer, but  
taken  
>>  
>>>as a whole, then  
>>>certainly they may very well sound different. In addition, hardware digital  
>>>mixers may use a variety of different paths between the I/O, channel  
>>>processing, and summing,  
>>>though most are pretty much software mixers on a single chip or set of  
>dsp  
>>  
>>>similar to ProTools,  
>>>with I/O and a hardware surface attached.  
>>>  
>>>I know it may be hard to separate the mix engine as software in either  
>a  
>>  
>>>native DAW  
>>>or a digital mixer, from the hardware that translates the audio to something  
>>  
>>>we hear,  
>>>but that's what is required when comparing summing. The hardware can

>>>significantly change  
>>>what we hear, so comparing digital mixers really isn't of as much interest  
>>  
>>>as comparing native  
>>>DAWs in that respect - unless you are looking to buy one of course.  
>>>  
>>>Even though I know you think manufacturers are trying to add something  
>to  
>>  
>>>give them an edge, I am 100%  
>>>sure that isn't the case - rather they are trying to add or change as  
little  
>>  
>>>as possible in order to give  
>>>them the edge. Their end of digital audio isn't about recreating the  
past,  
>>  
>>>but improving upon it.  
>>>As we've discussed and agreed before, the obsession with recreating  
>>>"vintage" technology is as much  
>>>fad as it is a valuable creative asset. There is no reason we shouldn't  
>>  
>>>have far superior hardware and software EQs and comps  
>>>than 20, 30 or 40 years ago. No reason at all, other than market demand,  
>>  
>>>but the majority of software, and new  
>>>hardware gear on the market has a vintage marketing tagline with it.  
>>>Companies will sell any bill of  
>>>goods if customers will buy it.  
>>>  
>>>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>>>or Sonar, and it's pretty safe to include Logic and DP in that list as  
>well.  
>>  
>>>One of the reasons I test  
>>>these things is to be sure my DAW isn't doing something wrong, or something  
>>  
>>>I don't know about.  
>>>  
>>>Vegas - I use it for video conversions and have never done any critical  
>>  
>>>listening tests with it. What I have heard  
>>>briefly didn't sound any different. It certainly looks plain vanilla  
  
>>>though. What you are describing is exactly  
>>>what I would say about the GUIs of each of those apps, not that it means  
>>

>>>anything. Just interesting.  
>>>  
>>>That's one reason I listen eyes closed and double check with phase  
>>>cancellation tests and FFTs - I am  
>>>influenced creatively by the GUI to some degree. I actually like Cubase  
>>4's  
>>>GUI better than Nuendo 3.2,  
>>>though there are only slight visual differences (some workflow differences  
>>  
>>>are a definite improvement for me though).  
>>>  
>>>ProTools' GUI always made me want to write one dimensional soundtracks  
>in  
>>  
>>>mono for public utilities, accounting offices  
>>>or the IRS while reading my discreet systems analysis textbook - it was  
>>also  
>>>grey. ;-)  
>>>  
>>>Regards,  
>>>Dedric  
>>>  
>>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>>>  
>>>> Dedric, my simple test is simple..  
>>>> Using the same audio interface, with the same stereo file..null-ed to  
>>  
>>>> zero..No  
>>>> eq, for fx. Master fader on zero..  
>>>>  
>>>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that  
>>I  
>>>> have  
>>>> referenced before.. The sound coming from PT-M has a nice top end ,  
where  
>>>> as Neundo has a nice flatter sound quality.  
>>>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>>>  
>>>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
>>  
>>>> the  
>>>> 192 interface.  
>>>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>>>  
>>>> Somethings going on.  
>>>>  
>>>> Chucks post about how paris handles audio is a theory..Only Edmund can  
>>



>>>> truly  
>>>> give us the goods on what's really what..  
>>>>  
>>>> I disagree that manufacturers don;t set out o put a sonic print on their  
>>  
>>>> products.  
>>>> I think they do.  
>>>>  
>>>> I have been fortunate to work on some digital mixers and I can tell  
you  
>>  
>>>> that  
>>>> each one has their own sound. The Sony Dmx-100 was modeled after SSL  
>4000g  
>>>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
>>warm  
>>>> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
>>>> Dm2000(version 1.x) which has a very Clean, neutral sound..However,  
some  
>>>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
>>  
>>>> which  
>>>> added Vintage type Eq's, modeled analog input gain saturation fx too  
>give  
>>>> the user a choice Btw Clean and Neutral vs sonic Character.  
>>>>  
>>>> So, if digital conoles can be given a sonic character, why not a software  
>>>> mixer?  
>>>> The truth is, there are some folks who want a neutral mixer and then  
>there  
>>>> are others who want a sonic footprint imparted. and these can be coded  
>>in  
>>>> the digital realm.  
>>>> The appllies with the manufactuers. They too have their vision on what  
>>They  
>>>> think and want their product to sound.  
>>>>  
>>>> I love reading on gearslutz the posts from Plugin developers and their  
>>  
>>>> interpretations  
>>>> and opinions about what makes their Neve 1073 Eq better and what goes  
>>into  
>>>> making their version sound like it does.. Each Developer has a different  
>>>> vision as to what the Neve 1073 should sound like. And yet they all  
sound  
>>>> good , but slightly different.  
>>>>  
>>>> You stated that you use Vegas. Well as you know, Vegas has a very generic

>>>> sound..Just plain and simple. But, i bet you can tell the difference  
>>on  
>>>> your system when you play that same file in Nuendo (No, fx, eq,  
>>>> null-edzerro)..  
>>>> ???  
>>>>  
>>>>  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>Lamont - what is the output chain you are using for each app when  
>>>>>comparing  
>>>>  
>>>>>the file in Nuendo  
>>>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?  
>>>>>Since these can't use the same output driver, you would have to depend  
>>on  
>>>>  
>>>>>the D/A being  
>>>>>the same, but clocking will be different unless you have a master clock,  
>>>> and  
>>>>>both interfaces  
>>>>>are locking with the same accuracy. This was one of the issues that  
>came  
>>>> up  
>>>>>at Lynn Fuston's  
>>>>>D/A converter shootout - when do you lock to external clock and incur  
>>the  
>>>>  
>>>>>resulting jitter,  
>>>>>and when do you trust the internal clock - and if you do lock externally,  
>>>>  
>>>>>how good is the PLL  
>>>>>in the slave device? These issues can cause audible changes in the  
>top  
>>>> end  
>>>>>that have nothing to do  
>>>>>with the software itself. If you say that PTHD through the same converter  
>>>>  
>>>>>output as Nuendo (via? RME?  
>>>>>Lynx?) using the same master clock, sounds different playing a single  
>>  
>>>>>audio  
>>>>  
>>>>>file, then I take your word  
>>>>>for it. I can't tell you why that is happening - only that an audible  
>>>>>difference really shouldn't happen due  
>>>>>to the software alone - not with a single audio file, esp. since I've  
>>  
>>>>>heard

>>>>  
>>>>>and seen PTHD audio cancel with  
>>>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
>>to  
>>>> the  
>>>>>output driver should  
>>>>>be, and usually is, completely transparent, bit for bit.  
>>>>>  
>>>>>The same audio file played through the same converters should only sound  
>>>>>  
>>>>>different if something in  
>>>>>the chain is different - be it clocking, gain or some degree of  
>>>>>unintended,  
>>>>>  
>>>>>errant dsp processing. Every DAW should  
>>>>>pass a single audio file without altering a single bit. That's a basic  
>>  
>>>>>level  
>>>>>  
>>>>>of accuracy we should always  
>>>>>expect of any DAW. If that accuracy isn't there, you can be sure a  
heavy  
>>>>>  
>>>>>mix will be altered in ways you  
>>>>>didn't intend, even though you would end up mixing with that factor  
in  
>>  
>>>>>place  
>>>>>  
>>>>>(e.g. you still mix for what  
>>>>>you want to hear regardless of what the platform does to each audio  
track  
>>>>> or  
>>>>>channel).  
>>>>>  
>>>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>>>lightpipe to another DAW, record it  
>>>>>bring the recorded file back in, line them up to the first bit, and  
have  
>>>>>  
>>>>>them cancel on and inverted phase  
>>>>>test. I did this with Nuendo and Cubase 4 on separate machines just  
>to  
>>>>> be  
>>>>>sure my master clocking and  
>>>>>slave sync was accurate - it worked perfectly.  
>>>>>  
>>>>>Also be sure there isn't a variation in the gain even by 0.1 dB between

>>>> the  
>>>>>two. There shouldn't  
>>>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>>>different  
>>>>  
>>>>>pan law? Shouldn't make a  
>>>>>difference even if comparing two mono panned files to their stereo  
>>>>>interleaved equivalent, but for sake  
>>>>>of completeness it's worth checking as well. A variation in the output  
>>>>  
>>>>>chain, be it drivers, audio card  
>>>>>card, or converters would be the most likely culprit here.  
>>>>>  
>>>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>>>intentionally is that the  
>>>>>ultimate goal from day one with recording has been to accurately reproduce  
>>>>  
>>>>>what we hear.  
>>>>>We developed a musical penchant for sonic character because the hardware  
>>>>  
>>>>>just wasn't accurate,  
>>>>>and what it did often sent us down new creative paths - even if by force  
>>>> -  
>>>>>and we decided it was  
>>>>>preferred that way.  
>>>>>  
>>>>>Your point about what goes into the feature presets to sell synths is  
>>  
>>>>>right  
>>>>  
>>>>>for sure, but synths are about  
>>>>>character and getting that "perfect piano" or crystal clear bell pad,  
>>or  
>>>> fat  
>>>>>punchy bass without spending  
>>>>>a mint on development, adding 50G onboard sample libraries, or costing  
>>  
>>>>>\$15k,  
>>>>  
>>>>>so what they  
>>>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>>>> on  
>>>>>the output. That's been the case  
>>>>>for years, at least since we had effects on synths at least. But even  
>>  
>>>>>with  
>>>>  
>>>>>modern synths such as the Fantom,

>>>>Tritons, etc, which are great synths all around, of course the coolest,  
>>>>  
>>>>widest and biggest patches  
>>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>>>  
>>>>reverbs, chorus, etc. The best  
>>>>way to find out if a synth is really good is to bypass all effects and  
>>see  
>>>>  
>>>>what happens. Most are pretty  
>>>>good these days, but about half the time, there are presets that fall  
>>>>completely flat in fx bypass.  
>>>>  
>>>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>>>>  
>>>>are - they are designed  
>>>>to \*not\* add anything - to pass through what we create as users, with  
>>no  
>>>>  
>>>>alteration (or as little as possible)  
>>>>beyond what we add with intentional processing (EQ, comps, etc).  
>>>>Developers  
>>>>  
>>>>would find no pride  
>>>>in hearing that their DAW sounds anything different than whatever is  
>being  
>>>>  
>>>>played back in it,  
>>>>and the concept is contrary to what AES and IEEE proceedings on the  
>issue  
>>>>  
>>>>propose in general  
>>>>digital audio discussions, white papers, etc.  
>>>>  
>>>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>>>>  
>>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>>is drop the track gain by 20dB or so, then added it back at the master  
>>  
>>>>buss  
>>>>  
>>>>to create the effect of headroom (probably  
>>>>because the master buss is really summing on the card, and they have  
>more  
>>>>  
>>>>headroom there than on the tracks  
>>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>>>

>>>>float files to the EDS card, but sort of  
>>>>doubt it. I think Chuck has clarified this at one point, but don't  
recall  
>>>>  
>>>>the answer.  
>>>>  
>>>>Also what Paris did is use a greater bit depth on the hardware than  
  
>>>>ProTools  
>>>>  
>>>>did - at the time PT was just  
>>>>bring Mix+ systems to market, or they had been out for a year or two  
>(if  
>>>> I  
>>>>have my timeline right) - they  
>>>>were 24-bit fixed all the way through. Logic and Cubase were native  
>DAWs,  
>>>>  
>>>>but native was still too slow  
>>>>to compete with hardware hybrids. Paris trumped them all by running  
>  
>>>>32-bit  
>>>>  
>>>>float natively (not new really, but  
>>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
>>of  
>>>>  
>>>>going to Motorola DSPs at 24.  
>>>>The onboard effects were also a step up from anything out there, so  
the  
>>>> demo  
>>>>did sound good.  
>>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>>sloppy production and  
>>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>>  
>>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>>>> no  
>>>>one else had. With very nice  
>>>>onboard effects, Paris jumped ahead of anything else out there easily,  
>>and  
>>>>  
>>>>still respectably holds its' own today  
>>>>in that department.  
>>>>  
>>>>Most demos I hear (when I listen to them) vary in quality, usually not  
>>so  
>>>>

>>>>great in some area. But if a demo does  
>>>>sound great, then it at least says that the product is capable of at  
>>  
>>>>least  
>>>>  
>>>>that level of performance, and it can  
>>>>only help improve a prospective buyer's impression of it.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>>  
>>>>> Dedric good post..  
>>>>>  
>>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and  
>>it  
>>>>  
>>>>> has  
>>>>> that same sound (no eq, zero fader) that HD does. I know their use  
>the  
>>>>  
>>>>> same  
>>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>>> fader)..results.  
>>>>> different sonic character.  
>>>>>  
>>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm  
>>just  
>>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>>> ..zilch..nada..  
>>>>>  
>>>>> Now, there are devices (keyboards, dum machines) on the market today  
>>  
>>>>> that  
>>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>>>  
>>>>> up.  
>>>>> Why? because it gives their product an competitive advantageover the  
>>>>> competition..  
>>>>> Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>>  
>>>>> So, why would'nt a DAW manufactuer code in an extra (ooommf) to make  
>>  
>>>>> their  
>>>>> DAW sound better. Especially, given the "I hate Digital Summing" crowd?  
>>>>  
>>>>> And,

>>>>> If I'm a DAW manufactuer, what would give my product a sonic edge  
over  
>>>> the  
>>>>> competition?  
>>>>>  
>>>>> We live in the "louder is better" audio world these days, so a DAW  
>that  
>>>>  
>>>>> can  
>>>>> catch my attention 'sonically" will probaly will get the sell. That's  
>>>> what  
>>>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
>>>> to  
>>>>> this day, nothing has floored me like that "Road House Blues Demo"  
>|  
>>  
>>>>> heard  
>>>>> on Paris.  
>>>>>  
>>>>> Was it the hardware ? was it the software. I remember talking with  
>  
>>>>> Edmund  
>>>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>>>> reproduce  
>>>>> the sonics of big buck analog board (eq's) and all.. And, summing  
was  
>>>> a  
>>>>> big  
>>>>> big issue for them because they (ID) thought that nobody has gotten  
>>>>> it(summing)  
>>>>> right. And by right, they meant, behaved like a console with a wide  
>>lane  
>>>>> for all of those tracks..  
>>>>>  
>>>>>  
>>>>>  
>>>>>  
>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>>news:458be8d5\$1@linux...  
>>>>>>>  
>>>>>>> Okay...  
>>>>>>> I guess what I'm saying is this:  
>>>>>>>  
>>>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>>>> differently  
>>>>>>> for sound results.  
>>>>>>>



>>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>>specific  
>>>>>>  
>>>>>>sound shaping purpose  
>>>>>>beyond normal summing/mixing. Users talk about wanting developers  
>to  
>>>> add  
>>>>>> a  
>>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>>but that's really impractical given the amount of dsp required to  
make  
>>>> a  
>>>>>>  
>>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>>etc). For sake of not eating up all cpu processing, that could likely  
>>>>  
>>>>>>only  
>>>>>>  
>>>>>>surface as is a built in EQ, which  
>>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>>  
>>>>>>So it hasn't happened yet and isn't likely to as it detours from the  
>>  
>>>>>>basic  
>>>>>>  
>>>>>>tenant of audio recording - recreate what comes in as  
>>>>>>accurately as possible.  
>>>>>>  
>>>>>>What Digi did in recoding their summing engine was try to recover  
some  
>>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k  
>dsp  
>>>>>> are  
>>>>>>24-bit fixed point chips and I think  
>>>>>>the new generation (321?) still is, but they use double words now  
for  
>>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>>>> the  
>>>>>>  
>>>>>>buss  
>>>>>>between chips was 24-bits, so they had to dither to 24-bits after  
every  
>>>>>>  
>>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
>>  
>>>>>>mixer

>>>>> to  
>>>>>>prevent this  
>>>>>>constant truncation of data. 24-bits isn't enough to cover summing  
>>for  
>>>>> more  
>>>>>>than a few tracks without  
>>>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>>>information will be lost, at least at the lowest levels.  
>>>>>>  
>>>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>>>  
>>>>>>implement a 48-bit double word stage as well),  
>>>>>>simply smoothed over the truncation that was happening, but it didn't  
>>>>  
>>>>>>solve  
>>>>>>  
>>>>>>the problem, so with HD  
>>>>>>they went to a double-word path - throughout I believe, including  
the  
>>>> path  
>>>>>>  
>>>>>>between chips. I believe the chips  
>>>>>>are still 24-bit, but by doubling up the processing (yes at a cost  
>of  
>>>>  
>>>>>>twice  
>>>>>>  
>>>>>>the overhead), they get a 48-bit engine.  
>>>>>>This not only provided better headroom, but greater resolution. Higher  
>>>>>> bit  
>>>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>>>really where we get the definition of dynamic range - by lowering  
the  
>>>>  
>>>>>>signal  
>>>>>>  
>>>>>>to quantization noise ratio.  
>>>>>>  
>>>>>>With DAWs that use 32-bit floating point math all the way through,  
>the  
>>>>  
>>>>>>only  
>>>>>>  
>>>>>>reason for altering the summing  
>>>>>>is by error, and that's an error that would actually be hard to make  
>>and  
>>>>>> get  
>>>>>>past a very basic alpha stage of testing.

>>>>>>There is a small difference in fixed point math and floating point  
>math,  
>>>>>> or  
>>>>>>at least a theoretical difference in how it affects audio  
>>>>>>in certain cases, but not necessarily in the result for calculating  
>>gain  
>>>>>> in  
>>>>>>>either for the same audio file. Where any differences might show  
up  
>>is  
>>>>>>>  
>>>>>>>complicated, and I believe only appear at levels below 24-bit (or  
in  
>>>>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>>>>there are any differences in where each amplitude level is quantized.  
>>>>>>>  
>>>>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>>>>depths  
>>>>>>>  
>>>>>>>throughout a single summing path to accomodate hardware  
>>>>>>>as well as software summing, since there may be truncation or rounding  
>>>>>>>  
>>>>>>>along  
>>>>>>>  
>>>>>>>the way, but that impacts the lowest bit  
>>>>>>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>>>>>>"depth",  
>>>>>>>  
>>>>>>>not the levels most music so the differences are most  
>>>>>>>often more subtle than not. But most modern DAWs have eliminated  
those  
>>>>>>>  
>>>>>>>"rough edges" in the math by increasing the bit depth to accomodate  
>>  
>>>>>>>normal  
>>>>>>>  
>>>>>>>summing required for mixing audio.  
>>>>>>>  
>>>>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
>>>> DAWs  
>>>>>>>  
>>>>>>>were never asked to sum beyond 24-bits,  
>>>>>>>at least not on the upper end of the dynamic range, so everything  
that  
>>>>>>>  
>>>>>>>could  
>>>>>>>  
>>>>>>>represent 24-bits accurately would cancel. The only ones

>>>>>>that didn't were ones that had a different bit depth and/or gain  
>>>>>>structure  
>>>>>>  
>>>>>>whether hybrid or native  
>>>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>>>> In  
>>>>>>  
>>>>>>this case, PTHD cancelled (when I tested it) with  
>>>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>>>> vs.  
>>>>>>  
>>>>>>32-bit float wasn't a factor.  
>>>>>>  
>>>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>>>  
>>>>>>Sequoia and Sonar cancel - both audibly and  
>>>>>>visually at inaudible levels, which only proves that one isn't making  
>>>> an  
>>>>>>  
>>>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>>>and the math to add gain is simple, they shouldn't. The fact that  
>they  
>>>>>> all  
>>>>>>use 32-bit float all the way through eliminates a difference  
>>>>>>in data structure as well, and this just verifies that. There was  
>a  
>>  
>>>>>>time  
>>>>>>  
>>>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor  
>went,  
>>>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>>>Nuendo/Cubase,  
>>>>>>  
>>>>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>>>> but  
>>>>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>>>>That was an intentional choice by the developer, but he's the only  
>one  
>>>> I  
>>>>>>  
>>>>>>know of that stuck with 24-bit for summing  
>>>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>>>  
>>>>>>Long answer, but to sum up, it is certainly physically \*possible\*  
>for  
>>>> a

>>>>>  
>>>>>>developer to code something differently intentionally, but not  
>>>>>>in reality likely since it would be breaking some basic fixed point  
>>or  
>>>>>>floating point math rules. Where the differences really  
>>>>>>showed up in the past is with PT Mix systems where the limitation  
was  
>>>>  
>>>>>>really  
>>>>>>  
>>>>>>significant - e.g. 24 bit with truncation at several stages.  
>>>>>>  
>>>>>>That really isn't such an issue anymore. Given the differences in  
>>>>>>workflow,  
>>>>>>  
>>>>>>missing something in workflow or layout differences  
>>>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the  
>way  
>>>>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>>>>not software busses, so in Sonar, busses are actually outputs, and  
>sub  
>>>>>>busses are actually busses in Nuendo. There are no,  
>>>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
>>>> -  
>>>>>> that  
>>>>>>affects the results of some tests (though not basic  
>>>>>>summing) if not taken into account, but when taken into account, they  
>>>> work  
>>>>>>  
>>>>>>exactly the same way).  
>>>>>>  
>>>>>>So at least when talking about apps with 32-bit float all the way  
  
>>>>>>through,  
>>>>>>  
>>>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>>>>  
>>>>>>unless  
>>>>>>there is an error somewhere, or variation in how the user duplicates  
>>the  
>>>>>>  
>>>>>>same mix in two different apps.  
>>>>>>  
>>>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>>>  
>>>>>>basis for recording and mixing from which users can make all  
>>>>>>of the decisions as to how the final product will sound and not be  
>>>>>>required

>>>>>  
>>>>>>to decide when purchasing a pricey console, and have to  
>>>>>>focus their business on clients who want "that sound". I believe  
we  
>>are  
>>>>>  
>>>>>>actually closer to the pure definition of recording now than  
>>>>>>we once were.  
>>>>>>  
>>>>>>Regards,  
>>>>>>Dedric  
>>>>>>  
>>>>>>  
>>>>>>  
>>>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>>>> un-cover  
>>>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>>>> Steinberg  
>>>>>>> and so on..  
>>>>>>>  
>>>>>>>> What's under the hood. To me and others,when Digi re-coded their  
>  
>>>>>>>> summing  
>>>>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>>>>>  
>>>>>>>> bump.  
>>>>>>>> Where as Steinberg's summing is very neutral.  
>>>>>>>>  
>>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>>Hi Neil,  
>>>>>>>>>  
>>>>>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>>>>>through  
>>>>>>>>>>  
>>>>>>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>>>>>>conclusion - easy to do given how confusing digital audio can be.  
>>  
>>>>>>>>>>Each  
>>>>>>>>>>> word  
>>>>>>>>>>>represents an amplitude  
>>>>>>>>>>>>point on a single curve that is changing over time, and can vary  
>with  
>>>>>>>>>> a  
>>>>>>>>>>>  
>>>>>>>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>>>>>>>modulation  
>>>>>>>>>>>> of

>>>>>>>a single waveform,  
>>>>>>>that over a small amount of time creates the sound we translate  
-  
>>we  
>>>>  
>>>>>>>don't  
>>>>>>>  
>>>>>>>really hear a single sample at a time,  
>>>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>>>represent  
>>>>>>> a  
>>>>>>>single positive or negative peak  
>>>>>>>of a 22,050Hz waveform).  
>>>>>>>  
>>>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than  
number  
>>>>>> 24,  
>>>>>>>  
>>>>>>>you may hear, and will see that easily,  
>>>>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>>>>audible  
>>>>>>>  
>>>>>>>the difference.  
>>>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how  
"loud"  
>>>>>>>  
>>>>>>>>that  
>>>>>>>>  
>>>>>>>>bit's impact will be  
>>>>>>>>if there is a variation.  
>>>>>>>>  
>>>>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate  
song,  
>>>>>>> then  
>>>>>>>>  
>>>>>>>>it simply be a  
>>>>>>>>click (only audible if it's a high enough order bit) instead of  
an  
>>>>>>>>obvious  
>>>>>>>>  
>>>>>>>>musical difference, but that should never  
>>>>>>>>happen in a phase cancellation test between identical files higher  
>>  
>>>>>>>>than  
>>>>>>>> bit  
>>>>>>>>24, unless there are clock sync problems,  
>>>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>>>

>>>>>>>By definition of what DAWs do during playback and record, every audio  
>>>>>>>  
>>>>>>>stream  
>>>>>>>  
>>>>>>>has the same point in time (judged by the timeline)  
>>>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>>>>>  
>>>>>>>rate  
>>>>>>>  
>>>>>>>we are using. A phase cancellation test uses that  
>>>>>>>fact to compare two audio files word for word (and hence bit for  
>bit  
>>>>  
>>>>>>>since  
>>>>>>>  
>>>>>>>each bit of a 24-bit word would  
>>>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
>  
>>>>>>>aligned  
>>>>>>> to  
>>>>>>>the same start point, sample  
>>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>>point,  
>>>>>>>  
>>>>>>>bit for bit, and one is phase inverted,  
>>>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>>>completely  
>>>>>>>  
>>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>>must be the exact opposite of that same bit position in a word at  
>>the  
>>>>> same  
>>>>>>>  
>>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>>of the full difference file is valuable as it can show any differences  
>>>>> in  
>>>>>>>  
>>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>>there is no audible difference, the visual followup will show if  
>the  
>>>> two  
>>>>>>>  
>>>>>>>files truly cancel even a levels below hearing, or  
>>>>>>>outside of a frequency change that we will perceive.  
>>>>>>>  
>>>>>>>When they don't cancel, usually there will be way more than 1 bit



>>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>>thousands of samples. From a musical standpoint this is usually  
>in  
>>>> a  
>>>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>>>show up as the difference between them, and that usually happens  
>due  
>>>> to  
>>>>>>> some  
>>>>>>>form of processing difference between the files,  
>>>>>>>such as EQ, compression, frequency dependant gain changes, etc.  
That  
>>>> is  
>>>>>>> what  
>>>>>>>I believe you are thinking through, but when  
>>>>>>>talking about straight summing with no gain change (or known equal  
>>  
>>>>>>>gain  
>>>>>>>  
>>>>>>>changes), we are only looking at linear, one for one  
>>>>>>>comparisons between the two files' frequency representations.  
>>>>>>>  
>>>>>>>Regards,  
>>>>>>>Dedric  
>>>>>>>  
>>>>>>> Neil wrote:  
>>>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
>>>> the  
>>>>>>>  
>>>>>>>>>> last  
>>>>>>>>>>  
>>>>>>>>>>> bit). It's safe to say there is no difference, even in  
>>>>>>>>>>> quantization noise, which by technical rights, is considered  
>below  
>>>>>> the  
>>>>>>>  
>>>>>>>>>>> level  
>>>>>>>>>>>  
>>>>>>>>>>>>> of "cancellation" in such tests.  
>>>>>>>>>>>>>  
>>>>>>>>>>>>> I'm not necessarily talking about just the first bit or the  
>>>>>>>>>>>>> last bit, but also everything in between... what happens on bit  
>>>>>>>>>>>>> #12, for example? Everything on bit #12 should be audible, but  
>>>>>>>>>>>>> in an a/b test what if there are differences in what bits #8  
>>>>>>>>>>>>> through #12 sound like, but the amplitude is still the same on  
>>>>>>>>>>>>> both files at that point, you'll get a null, right? Extrapolate  
>>>>>>>>>>>>> that out somewhat & let's say there are differences in bits #8



>did not write the summing code. It's deep within the DSP code running on  
>the ESP2 chips. It was written by some very talented guys at Ensoniq. I  
>really dig everything that Edmund and Stephen did, but the summing just  
isn't  
>part of it.  
>  
>The stuff I posted is not really a theory. The PARIS mix engine source  
code  
>is freely available for download. Anyone with a little time, patience and  
>the ESP2 patent can clearly see what is going on. It's only a couple hundred  
>lines of code.  
>  
>Chuck  
>  
>"Dedric Terry" <dedric@echomg.com> wrote:  
>>I can't tell you why you hear ProTools differently than Nuendo using a  
  
>>single file.  
>>There isn't any voodoo in the software, or hidden character enhancing dsp.  
>  
>>I'll see if  
>>I can round up an M-Powered system to compare with next month.  
>>  
>>For reference, everytime I open Sequoia I think I might hear a broader,  
>  
>>clean,  
>>and almost flat (spectrum, not depth) sound, but I don't - it's the same  
>as  
>>Nuendo, fwiw.  
>>Also I don't think what I was referring to was a theory from Chuck - I  
>  
>>believe that was what he  
>>discovered in the code.  
>>  
>>Digital mixers all have different preamps and converters. Unless you are  
>  
>>bypassing every  
>>EQ and converter and going digital in and out to the same converter when  
>  
>>comparing, it would be hard  
>>to say the mix engine itself sounds different than another mixer, but taken  
>  
>>as a whole, then  
>>certainly they may very well sound different. In addition, hardware digital  
>>mixers may use a variety of different paths between the I/O, channel  
>>processing, and summing,  
>>though most are pretty much software mixers on a single chip or set of  
dsps

>  
>>similar to ProTools,  
>>with I/O and a hardware surface attached.  
>>  
>>I know it may be hard to separate the mix engine as software in either  
a  
>  
>>native DAW  
>>or a digital mixer, from the hardware that translates the audio to something  
>  
>>we hear,  
>>but that's what is required when comparing summing. The hardware can  
>>significantly change  
>>what we hear, so comparing digital mixers really isn't of as much interest  
>  
>>as comparing native  
>>DAWs in that respect - unless you are looking to buy one of course.  
>>  
>>Even though I know you think manufacturers are trying to add something  
to  
>  
>>give them an edge, I am 100%  
>>sure that isn't the case - rather they are trying to add or change as little  
>  
>>as possible in order to give  
>>them the edge. Their end of digital audio isn't about recreating the past,  
>  
>>but improving upon it.  
>>As we've discussed and agreed before, the obsession with recreating  
>>"vintage" technology is as much  
>>fad as it is a valuable creative asset. There is no reason we shouldn't  
>  
>>have far superior hardware and software EQs and comps  
>>than 20, 30 or 40 years ago. No reason at all, other than market demand,  
>  
>>but the majority of software, and new  
>>hardware gear on the market has a vintage marketing tagline with it.  
>>Companies will sell any bill of  
>>goods if customers will buy it.  
>>  
>>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>>or Sonar, and it's pretty safe to include Logic and DP in that list as  
well.  
>  
>>One of the reasons I test  
>>these things is to be sure my DAW isn't doing something wrong, or something  
>  
>>I don't know about.

>>  
>>Vegas - I use it for video conversions and have never done any critical  
>  
>>listening tests with it. What I have heard  
>>briefly didn't sound any different. It certainly looks plain vanilla  
>>though. What you are describing is exactly  
>>what I would say about the GUIs of each of those apps, not that it means  
>  
>>anything. Just interesting.  
>>  
>>That's one reason I listen eyes closed and double check with phase  
>>cancellation tests and FFTs - I am  
>>influenced creatively by the GUI to some degree. I actually like Cubase  
>4's  
>>GUI better than Nuendo 3.2,  
>>though there are only slight visual differences (some workflow differences  
>  
>>are a definite improvement for me though).  
>>  
>>ProTools' GUI always made me want to write one dimensional soundtracks  
in  
>  
>>mono for public utilities, accounting offices  
>>or the IRS while reading my discreet systems analysis textbook - it was  
>also  
>>grey. ;-)  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>>  
>>> Dedric, my simple test is simple..  
>>> Using the same audio interface, with the same stereo file..null-ed to  
>  
>>> zero..No  
>>> eq, for fx. Master fader on zero..  
>>>  
>>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that  
>|  
>>> have  
>>> referenced before.. The sound coming from PT-M has a nice top end , where  
>>> as Neundo has a nice flatter sound quality.  
>>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>>  
>>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
>  
>>> the

>>> 192 interface.  
>>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>>  
>>> Somethings going on.  
>>>  
>>> Chucks post about how paris handles audio is a theory..Only Edmund can  
>  
>>> truly  
>>> give us the goods on what's really what..  
>>>  
>>> I disagree that manufactuers don;t set out o put a sonic print on their  
>  
>>> products.  
>>> I think they do.  
>>>  
>>> I have been fortunate to work on some digital mixers and I can tell you  
>  
>>> that  
>>> each one has their own sound. The Sony Dmx-100 was modeled after SSL  
4000g  
>>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
>warm  
>>> and it's eq tries to behave and sound just like an SSL.. Unlike he Yamaha  
>>> Dm2000(version 1.x) which has a very Clean, neutral sound..However, some  
>>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
>  
>>> which  
>>> added Vintage type Eq's, modeled analog input gain saturation fx too  
give  
>>> the user a choice Btw Clean and Neutral vs sonic Character.  
>>>  
>>> So, if digital conoles can be given a sonic character, why not a software  
>>> mixer?  
>>> The truth is, there are some folks who want a neutral mixer and then  
there  
>>> are others who want a sonic footprint imparted. and these can be coded  
>in  
>>> the digital realm.  
>>> The appllies with the manufactuers. They too have their vision on what  
>They  
>>> think and want their product to sound.  
>>>  
>>> I love reading on gearslutz the posts from Plugin developers and their  
>  
>>> interpretations  
>>> and opinions about what makes their Neve 1073 Eq better and what goes  
>into  
>>> making their version sound like it does.. Each Developer has a different

>>> vision as to what the Neve 1073 should sound like. And yet they all sound  
>>> good , but slightly different.  
>>>  
>>> You stated that you use Vegas. Well as you know, Vegas has a very generic  
>>> sound..Just plain and simple. But, i bet you can tell the difference  
>on  
>>> your system when you play that same file in Nuendo (No, fx, eq,  
>>> null-edzerro)..  
>>> ???  
>>>  
>>>  
>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>Lamont - what is the output chain you are using for each app when  
>>>>comparing  
>>>  
>>>>the file in Nuendo  
>>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?  
>>>>Since these can't use the same output driver, you would have to depend  
>on  
>>>  
>>>>the D/A being  
>>>>the same, but clocking will be different unless you have a master clock,  
>>> and  
>>>>both interfaces  
>>>>are locking with the same accuracy. This was one of the issues that  
came  
>>> up  
>>>>at Lynn Fuston's  
>>>>D/A converter shootout - when do you lock to external clock and incur  
>the  
>>>  
>>>>resulting jitter,  
>>>>and when do you trust the internal clock - and if you do lock externally,  
>>>  
>>>>how good is the PLL  
>>>>in the slave device? These issues can cause audible changes in the top  
>>> end  
>>>>that have nothing to do  
>>>>with the software itself. If you say that PTHD through the same converter  
>>>  
>>>>output as Nuendo (via? RME?  
>>>>Lynx?) using the same master clock, sounds different playing a single  
>  
>>>>audio  
>>>  
>>>>file, then I take your word  
>>>>for it. I can't tell you why that is happening - only that an audible  
>>>>difference really shouldn't happen due

>>>>to the software alone - not with a single audio file, esp. since I've  
>  
>>>>heard  
>>>  
>>>>and seen PTHD audio cancel with  
>>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
>to  
>>> the  
>>>>output driver should  
>>>>be, and usually is, completely transparent, bit for bit.  
>>>>  
>>>>The same audio file played through the same converters should only sound  
>>>  
>>>>different if something in  
>>>>the chain is different - be it clocking, gain or some degree of  
>>>>unintended,  
>>>  
>>>>errant dsp processing. Every DAW should  
>>>>pass a single audio file without altering a single bit. That's a basic  
>  
>>>>level  
>>>  
>>>>of accuracy we should always  
>>>>expect of any DAW. If that accuracy isn't there, you can be sure a heavy  
>>>  
>>>>mix will be altered in ways you  
>>>>didn't intend, even though you would end up mixing with that factor in  
>  
>>>>place  
>>>  
>>>>(e.g. you still mix for what  
>>>>you want to hear regardless of what the platform does to each audio track  
>>> or  
>>>>channel).  
>>>>  
>>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>>lightpipe to another DAW, record it  
>>>>bring the recorded file back in, line them up to the first bit, and have  
>>>  
>>>>them cancel on and inverted phase  
>>>>test. I did this with Nuendo and Cubase 4 on separate machines just  
>to  
>>> be  
>>>>sure my master clocking and  
>>>>slave sync was accurate - it worked perfectly.  
>>>>  
>>>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>>> the



>>>>two. There shouldn't  
>>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>>different  
>>>  
>>>>pan law? Shouldn't make a  
>>>>difference even if comparing two mono panned files to their stereo  
>>>>interleaved equivalent, but for sake  
>>>>of completeness it's worth checking as well. A variation in the output  
>>>  
>>>>chain, be it drivers, audio card  
>>>>card, or converters would be the most likely culprit here.  
>>>>  
>>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>>intentionally is that the  
>>>>ultimate goal from day one with recording has been to accurately reproduce  
>>>  
>>>>what we hear.  
>>>>We developed a musical penchant for sonic character because the hardware  
>>>  
>>>>just wasn't accurate,  
>>>>and what it did often sent us down new creative paths - even if by force  
>>> -  
>>>>and we decided it was  
>>>>preferred that way.  
>>>>  
>>>>Your point about what goes into the feature presets to sell synths is  
>  
>>>>right  
>>>  
>>>>for sure, but synths are about  
>>>>character and getting that "perfect piano" or crystal clear bell pad,  
>or  
>>> fat  
>>>>punchy bass without spending  
>>>>a mint on development, adding 50G onboard sample libraries, or costing  
>  
>>>>\$15k,  
>>>  
>>>>so what they  
>>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>>> on  
>>>>the output. That's been the case  
>>>>for years, at least since we had effects on synths at least. But even  
>  
>>>>with  
>>>  
>>>>modern synths such as the Fantom,  
>>>>Tritons, etc, which are great synths all around, of course the coolest,

>>>  
>>>>widest and biggest patches  
>>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>>  
>>>>reverbs, chorus, etc. The best  
>>>>way to find out if a synth is really good is to bypass all effects and  
>see  
>>>  
>>>>what happens. Most are pretty  
>>>>good these days, but about half the time, there are presets that fall  
>>>>completely flat in fx bypass.  
>>>>  
>>>>DAWs aren't designed to put a sonic fingerprint on a sound the way synths  
>>>  
>>>>are - they are designed  
>>>>to \*not\* add anything - to pass through what we create as users, with  
>no  
>>>  
>>>>alteration (or as little as possible)  
>>>>beyond what we add with intentional processing (EQ, comps, etc).  
>>>>Developers  
>>>  
>>>>would find no pride  
>>>>in hearing that their DAW sounds anything different than whatever is  
being  
>>>  
>>>>played back in it,  
>>>>and the concept is contrary to what AES and IEEE proceedings on the issue  
>>>  
>>>>propose in general  
>>>>digital audio discussions, white papers, etc.  
>>>>  
>>>>What ID ended up doing with Paris (at least from what I gather per Chuck's  
>>>  
>>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>>is drop the track gain by 20dB or so, then added it back at the master  
>  
>>>>buss  
>>>  
>>>>to create the effect of headroom (probably  
>>>>because the master buss is really summing on the card, and they have  
more  
>>>  
>>>>headroom there than on the tracks  
>>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>>  
>>>>float files to the EDS card, but sort of  
>>>>doubt it. I think Chuck has clarified this at one point, but don't recall

>>>  
>>>>the answer.  
>>>>  
>>>>Also what Paris did is use a greater bit depth on the hardware than  
>>>>ProTools  
>>>  
>>>>did - at the time PT was just  
>>>>bring Mix+ systems to market, or they had been out for a year or two  
(if  
>>> I  
>>>>have my timeline right) - they  
>>>>were 24-bit fixed all the way through. Logic and Cubase were native  
DAWs,  
>>>  
>>>>but native was still too slow  
>>>>to compete with hardware hybrids. Paris trumped them all by running  
  
>>>>32-bit  
>>>  
>>>>float natively (not new really, but  
>>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
>of  
>>>  
>>>>going to Motorola DSPs at 24.  
>>>>The onboard effects were also a step up from anything out there, so the  
>>> demo  
>>>>did sound good.  
>>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>>sloppy production and  
>>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>>  
>>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>>> no  
>>>>one else had. With very nice  
>>>>onboard effects, Paris jumped ahead of anything else out there easily,  
>and  
>>>  
>>>>still respectably holds its' own today  
>>>>in that department.  
>>>>  
>>>>Most demos I hear (when I listen to them) vary in quality, usually not  
>so  
>>>  
>>>>great in some area. But if a demo does  
>>>>sound great, then it at least says that the product is capable of at  
>  
>>>>least  
>>>

>>>>that level of performance, and it can  
>>>>only help improve a prospective buyer's impression of it.  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>>  
>>>>> Dedric good post..  
>>>>>  
>>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop and  
>it  
>>>  
>>>>> has  
>>>>> that same sound (no eq, zero fader) that HD does. I know their use  
the  
>>>  
>>>>> same  
>>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>>> fader)..results.  
>>>>> different sonic character.  
>>>>>  
>>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm  
>just  
>>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>>> ..zilch..nada..  
>>>>>  
>>>>> Now, there are devices (keyboards, dum machines) on the market today  
>  
>>>>> that  
>>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>>  
>>>>> up.  
>>>>> Why? because it gives their product an competitive advantageover the  
>>>>> competition..  
>>>>> Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>>  
>>>>> So, why would'nt a DAW manufactuer code in an extra (oommf) to make  
>  
>>>>> their  
>>>>> DAW sound better. Especially, given the "I hate Digtal Summing" crowd?  
>>>  
>>>>> And,  
>>>>> If I'm a DAW manufactuer, what would give my product a sonic edge over  
>>> the  
>>>>> competition?  
>>>>>  
>>>>> We live in the "louder is better" audio world these days, so a DAW

that  
>>>  
>>>>> can  
>>>>> catch my attention 'sonically" will probaly will get the sell. That's  
>>> what  
>>>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
>>> to  
>>>>> this day, nothing has floored me like that "Road House Blues Demo"  
|  
>  
>>>>> heard  
>>>>> on Paris.  
>>>>>  
>>>>> Was it the hardware ? was it the software. I remember talking with  
  
>>>>> Edmund  
>>>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>>>> reproduce  
>>>>> the sonics of big buck analog board (eq's) and all.. And, summing was  
>>> a  
>>>>> big  
>>>>> big issue for them because they (ID) thought that nobody has gotten  
>>>>> it(summing)  
>>>>> right. And by right, they meant, behaved like a console with a wide  
>lane  
>>>>> for all of those tracks..  
>>>>>  
>>>>>  
>>>>>  
>>>>>  
>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>>>news:458be8d5\$1@linux...  
>>>>>>>  
>>>>>>> Okay...  
>>>>>>> I guess what I'm saying is this:  
>>>>>>>  
>>>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>>>> differently  
>>>>>>> for sound results.  
>>>>>>>  
>>>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
>>>>>>>specific  
>>>>>>>  
>>>>>>>sound shaping purpose  
>>>>>>>beyond normal summing/mixing. Users talk about wanting developers  
to  
>>> add

>>>> a  
>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>but that's really impractical given the amount of dsp required to make  
>>> a  
>>>>>  
>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>etc). For sake of not eating up all cpu processing, that could likely  
>>>  
>>>>>only  
>>>>>  
>>>>>surface as is a built in EQ, which  
>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>  
>>>>>So it hasn't happened yet and isn't likely to as it detours from the  
>  
>>>>>basic  
>>>>>  
>>>>>tenant of audio recording - recreate what comes in as  
>>>>>accurately as possible.  
>>>>>  
>>>>>What Digi did in recoding their summing engine was try to recover some  
>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k  
dsp  
>>>>> are  
>>>>>24-bit fixed point chips and I think  
>>>>>the new generation (321?) still is, but they use double words now for  
>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>>> the  
>>>>>  
>>>>>buss  
>>>>>between chips was 24-bits, so they had to dither to 24-bits after every  
>>>>>  
>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
>  
>>>>>mixer  
>>>>> to  
>>>>>prevent this  
>>>>>constant truncation of data. 24-bits isn't enough to cover summing  
>for  
>>>>> more  
>>>>>than a few tracks without  
>>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>>information will be lost, at least at the lowest levels.  
>>>>>  
>>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>>

>>>>>implement a 48-bit double word stage as well),  
>>>>>simply smoothed over the truncation that was happening, but it didn't  
>>>  
>>>>>solve  
>>>>>  
>>>>>the problem, so with HD  
>>>>>they went to a double-word path - throughout I believe, including the  
>>> path  
>>>>>  
>>>>>between chips. I believe the chips  
>>>>>are still 24-bit, but by doubling up the processing (yes at a cost  
of  
>>>  
>>>>>twice  
>>>>>  
>>>>>the overhead), they get a 48-bit engine.  
>>>>>This not only provided better headroom, but greater resolution. Higher  
>>>>> bit  
>>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>>really where we get the definition of dynamic range - by lowering the  
>>>  
>>>>>signal  
>>>>>  
>>>>>to quantization noise ratio.  
>>>>>  
>>>>>With DAWs that use 32-bit floating point math all the way through,  
the  
>>>  
>>>>>only  
>>>>>  
>>>>>reason for altering the summing  
>>>>>is by error, and that's an error that would actually be hard to make  
>and  
>>>>> get  
>>>>>past a very basic alpha stage of testing.  
>>>>>There is a small difference in fixed point math and floating point  
math,  
>>>>> or  
>>>>>at least a theoretical difference in how it affects audio  
>>>>>in certain cases, but not necessarily in the result for calculating  
>gain  
>>>>> in  
>>>>>>either for the same audio file. Where any differences might show up  
>is  
>>>>>  
>>>>>>complicated, and I believe only appear at levels below 24-bit (or in  
>>>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>>>there are any differences in where each amplitude level is quantized.

>>>>>  
>>>>>Obviously there can be differences if the DAW has to use varying bit  
>>>>>depths  
>>>>>  
>>>>>throughout a single summing path to accomodate hardware  
>>>>>as well as software summing, since there may be truncation or rounding  
>>>  
>>>>>along  
>>>>>  
>>>>>the way, but that impacts the lowest bit  
>>>>>level, and hence - spacial reproduction, reverb tails perhaps, and  
>>>>>"depth",  
>>>>>  
>>>>>not the levels most music so the differences are most  
>>>>>often more subtle than not. But most modern DAWs have eliminated those  
>>>>>  
>>>>>"rough edges" in the math by increasing the bit depth to accomodate  
>  
>>>>>normal  
>>>>>  
>>>>>summing required for mixing audio.  
>>>>>  
>>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
>>> DAWs  
>>>>>  
>>>>>were never asked to sum beyond 24-bits,  
>>>>>at least not on the upper end of the dynamic range, so everything that  
>>>  
>>>>>could  
>>>>>  
>>>>>represent 24-bits accurately would cancel. The only ones  
>>>>>that didn't were ones that had a different bit depth and/or gain  
>>>>>structure  
>>>>>  
>>>>>whether hybrid or native  
>>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>>> In  
>>>>>  
>>>>>this case, PTHD cancelled (when I tested it) with  
>>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>>> vs.  
>>>>>  
>>>>>32-bit float wasn't a factor.  
>>>>>  
>>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>>  
>>>>>Sequoia and Sonar cancel - both audibly and  
>>>>>visually at inaudible levels, which only proves that one isn't making



>>> an  
>>>>  
>>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>>and the math to add gain is simple, they shouldn't. The fact that  
they  
>>>>> all  
>>>>>use 32-bit float all the way through eliminates a difference  
>>>>>in data structure as well, and this just verifies that. There was  
a  
>  
>>>>>time  
>>>>>  
>>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor  
went,  
>>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>>Nuendo/Cubase,  
>>>>>  
>>>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>>> but  
>>>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>>>That was an intentional choice by the developer, but he's the only  
one  
>>> I  
>>>>>  
>>>>>know of that stuck with 24-bit for summing  
>>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>>  
>>>>>Long answer, but to sum up, it is certainly physically \*possible\* for  
>>> a  
>>>>>  
>>>>>developer to code something differently intentionally, but not  
>>>>>in reality likely since it would be breaking some basic fixed point  
>or  
>>>>>floating point math rules. Where the differences really  
>>>>>showed up in the past is with PT Mix systems where the limitation was  
>>>  
>>>>>really  
>>>>>  
>>>>>significant - e.g. 24 bit with truncation at several stages.  
>>>>>  
>>>>>That really isn't such an issue anymore. Given the differences in  
>>>>>workflow,  
>>>>>  
>>>>>missing something in workflow or layout differences  
>>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the  
way  
>>>>>Nuendo does, as it's outputs are actually driver outputs,

>>>>>not software busses, so in Sonar, busses are actually outputs, and  
sub  
>>>>>busses are actually busses in Nuendo. There are no,  
>>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
>>> -  
>>>>> that  
>>>>>affects the results of some tests (though not basic  
>>>>>summing) if not taken into account, but when taken into account, they  
>>> work  
>>>>>  
>>>>>exactly the same way).  
>>>>>  
>>>>>So at least when talking about apps with 32-bit float all the way  
>>>>>through,  
>>>>>  
>>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>>>  
>>>>>unless  
>>>>>there is an error somewhere, or variation in how the user duplicates  
>the  
>>>>>  
>>>>>same mix in two different apps.  
>>>>>  
>>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>>  
>>>>>basis for recording and mixing from which users can make all  
>>>>>of the decisions as to how the final product will sound and not be  
>>>>>required  
>>>>>  
>>>>>to decide when purchasing a pricey console, and have to  
>>>>>focus their business on clients who want "that sound". I believe we  
>are  
>>>>>  
>>>>>actually closer to the pure definition of recording now than  
>>>>>we once were.  
>>>>>  
>>>>>Regards,  
>>>>>Dedric  
>>>>>  
>>>>>  
>>>>>  
>>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>>> un-cover  
>>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>>> Steinberg  
>>>>>> and so on..  
>>>>>>  
>>>>>> What's under the hood. To me and others,when Digi re-coded their

>>>>>> summing  
>>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>>  
>>>>>> bump.  
>>>>>> Where as Steinberg's summing is very neutral.  
>>>>>>  
>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>Hi Neil,  
>>>>>>>  
>>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>>through  
>>>>>>>  
>>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>>conclusion - easy to do given how confusing digital audio can be.  
>  
>>>>>>>Each  
>>>>>>> word  
>>>>>>>represents an amplitude  
>>>>>>>point on a single curve that is changing over time, and can vary  
with  
>>>>> a  
>>>>>>>  
>>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>>modulation  
>>>>>>> of  
>>>>>>>a single waveform,  
>>>>>>>that over a small amount of time creates the sound we translate -  
>we  
>>>  
>>>>>>>don't  
>>>>>>>  
>>>>>>>really hear a single sample at a time,  
>>>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>>>represent  
>>>>>>> a  
>>>>>>>single positive or negative peak  
>>>>>>>of a 22,050Hz waveform).  
>>>>>>>  
>>>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than number  
>>>>> 24,  
>>>>>>>  
>>>>>>>you may hear, and will see that easily,  
>>>>>>>and the higher the bit in the dynamic range (higher order) the more  
>>>>>>>audible  
>>>>>>>  
>>>>>>>the difference.

>>>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how "loud"  
>>>>>  
>>>>>>>that  
>>>>>>>  
>>>>>>>bit's impact will be  
>>>>>>>if there is a variation.  
>>>>>>>  
>>>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate song,  
>>>>> then  
>>>>>>>  
>>>>>>>it simply be a  
>>>>>>>click (only audible if it's a high enough order bit) instead of an  
>>>>>>>obvious  
>>>>>>>  
>>>>>>>musical difference, but that should never  
>>>>>>>happen in a phase cancellation test between identical files higher  
>  
>>>>>>>than  
>>>>>>> bit  
>>>>>>>24, unless there are clock sync problems,  
>>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>>  
>>>>>>>By definition of what DAWs do during playback and record, every audio  
>>>>>  
>>>>>>>stream  
>>>>>>>  
>>>>>>>has the same point in time (judged by the timeline)  
>>>>>>>played back sample accurately, one word at a time, at whatever sample  
>>>>>  
>>>>>>>rate  
>>>>>>>  
>>>>>>>we are using. A phase cancellation test uses that  
>>>>>>>fact to compare two audio files word for word (and hence bit for  
bit  
>>>  
>>>>>>>since  
>>>>>>>  
>>>>>>>each bit of a 24-bit word would  
>>>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
  
>>>>>>>aligned  
>>>>>>> to  
>>>>>>>the same start point, sample  
>>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>>point,  
>>>>>>>  
>>>>>>>bit for bit, and one is phase inverted,  
>>>>>>>they will cancel through all 24 bits. For two files to cancel

>>>>>>>completely  
>>>>>>>  
>>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>>must be the exact opposite of that same bit position in a word at  
>the  
>>>>> same  
>>>>>>>  
>>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>>of the full difference file is valuable as it can show any differences  
>>>>> in  
>>>>>>>  
>>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>>there is no audible difference, the visual followup will show if  
the  
>>> two  
>>>>>>>  
>>>>>>>files truly cancel even a levels below hearing, or  
>>>>>>>outside of a frequency change that we will perceive.  
>>>>>>>  
>>>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>>thousands of samples. From a musical standpoint this is usually  
in  
>>> a  
>>>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>>>show up as the difference between them, and that usually happens  
due  
>>> to  
>>>>>>> some  
>>>>>>>form of processing difference between the files,  
>>>>>>>such as EQ, compression, frequency dependant gain changes, etc. That  
>>> is  
>>>>>>> what  
>>>>>>>I believe you are thinking through, but when  
>>>>>>>talking about straight summing with no gain change (or known equal  
>  
>>>>>>>gain  
>>>>>>>  
>>>>>>>changes), we are only looking at linear, one for one  
>>>>>>>comparisons between the two files' frequency representations.  
>>>>>>>  
>>>>>>>Regards,  
>>>>>>>Dedric  
>>>>>>>  
>>>>>>> Neil wrote:  
>>>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>>> The tests I did were completely blank down to -200 dB (far below  
>>> the



>>  
>

---

Subject: Re: (No subject)...What's up under the hood?  
Posted by [Dedric Terry](#) on Sun, 24 Dec 2006 02:10:24 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Actually Fredo never said Steinberg's way of coding 32-bit was different, he just said he didn't know how Sonar would cancel below -144dB in the same test case \*unless\* it was handled differently - just a supposition on his part. The truth is, both apps responded identically in every test I've thrown at them. The difference is that Sonar's definition of busses is one level lower than Nuendo's, so duplicating the test required figuring that out (basically Sonar doesn't seem to have groups per se, and output "busses" are really just driver output assignments, not true busses, where Nuendo has busses that can be assigned to outputs; Sonar has some form of sub-busses (can't recall the name) that act the same as Nuendo's main busses - semantics, but it makes Nuendo more flexible with routing, grouping, etc). So when using the same buss routing (e.g. a sub-buss to another sub-buss), Sonar produced the exact same result.

Also Fredo's post is about what happens when you clip a channel or buss - that isn't a normal mixing condition since it creates distortion and that's where he stated that a 64-bit engine would (he is assuming) provide greater headroom.

Regarding 64-bit in general, check into some comments from Joe Bryan of UA and a few others. Just having 64-bits doesn't automatically mean audio engines will sound "better" (or different) but there may be some processing tradeoffs.

The real advantage I look forward to is a 64-bit app and OS (not the same as 64-bit audio engine of course) to enable addressing more than 2G (really 3G or so) for sample libraries.

Regards,  
Dedric

"LaMont" <jjppro@ameritech.net> wrote:

>  
>But, Fredo explains that Steinberg's way of coding a 32 bit audio engine is  
>different than say Cakewalk..And explained the trade-offs and decisions that  
>are made to achieve what a developer thinks is good audio.  
>  
>And, Why would I(if I were a DAW devloper) want my audio engine to sound

>like my competitors? I would not..This is where the trade-off decisions  
come  
>from.  
>  
>However, it was interesting to rad wen he stated that 'all whill be fixed  
>(aka: no trade-offs) when Seinberg goes native 64bit.  
>  
>That says to me that they (Steinberg) knows that their 32bit audio engine  
>is not wide enough to handle loads of audio, with vstis, plugins, without  
>introducing or trading-off sound quality..Interesting.  
>  
>"Dedric Terry" <dterry@keyofd.net> wrote:  
>>  
>>I was part of that thread (kdm) and did those tests - I actually took them  
>>a step further than Jake or Fredo. As you can see I incorrectly thought  
>>there was something in the group summing process, but it was just my boneheaded  
>>interpretation of output data (using a small sample section for FFT rather  
>>than the full file mainly). :-((  
>>  
>>What Fredo is talking about is when you go over 0dBFS what happens to the  
>>"over" data, and the references to truncation are in that case, which isn't  
>>normal for mixing. This is the same decision every native DAW developer  
>>has to make.  
>>  
>>We were actually discussing what happens when you sum to a group vs. summing  
>>to the main bus, without overs. I did my test with all files summing to  
>>-20dB, so there was no chance of pushing the upper limits of 32-bit float's  
>>truncation back down to 24-bits. And I actually simplified it by using  
>two  
>>copies of the same file (just as Fredo did), one phase inverted, both sample  
>>aligned. They cancelled to below 24 bits just as expected, and just as  
>they  
>>should. The variations below 24 bits that I saw (and thought were above  
>>24-bits at one point) are correlation of lower frequencies when gain and  
>>equivalent reduction are introduced (which is what Chuck stated that Paris  
>>does up front on every track). That really doesn't impact the audio itself  
>>since data below -136dB is quantization noise for 24-bit audio.  
>>  
>>Sonar, Nuendo, Cubase 4 and Sequoia all behaved exactly the same way in  
>this  
>>test - which tells me they are handling the LSB's the same way. When data  
>>is summed to groups, there will be quantization noise below -136dB. This  
>>is completely normal for any native DAW and they all are subject to it.  
>  
>>As you might read in the thread my conclusion was that we proved digital  
>>audio theory exists - e.g. no uncharted territory, no digital audio frontiers,  
>>no bugs in Nuendo. yeeha. But that's what I get for second guessing talented  
>>developers. ;-)



>>  
>>Fwiw, to take it a step further, Samplitude/Sequoia and Nuendo handle overs,  
>>or "into the red" identically. I checked that too a while back after the  
>>reports of extra headroom, etc in Samplitude. Believe me, I've tried hard  
>>to find where any differences might appear, not just noticeable differences,  
>>but any differences at the lowest levels, but it seems the major native  
>DAW  
>>players are making the same decisions when it comes to truncation, etc,  
>and  
>>there really aren't that many to make. In my tests, dither really wasn't  
>>an issue (I turned it off in all DAWs I tested just to test with pure truncation).  
>>  
>>Regards,  
>>Dedric  
>>  
>>"LaMOnT" <jjdpro@ameritech.net> wrote:  
>>>  
>>>Dedric, check out this post from our dear friend Fredo: Neundo Moderator:  
>>>Explaining how Steingberg's audio engine works. Note the trade-offs..Meaning,  
>>>Steinberg's way of coding an audio-engine 32bit float is different than  
>>say  
>>>Magix Samplitude:  
>>>  
>>>Fredo  
>>>Administrative Moderator  
>>>  
>>>  
>>>Joined: 29 Dec 2004  
>>>Posts: 4213  
>>>Location: Belgium  
>>> Posted: Fri Dec 08, 2006 2:33 pm Post subject:  
>>>  
>>> -----  
>>>  
>>>I think I see where the problem is.  
>>>In my scenario's I don't have any track that goes over 0dBfs, but I have  
>>>always lowered one channel to compensate with another.  
>>>So, I never went over the 0dB fs limit.  
>>>  
>>>Here's the explanation:  
>>>  
>>>As soon as you go over 0dB, technically you are entering the domain of  
>distortion.  
>>>  
>>>In a 32bit FP mixer, that is not the case since there is unlimited headroom.  
>>>  
>>>  
>>>Now follow me step by step please - read this slow and make sure you understand

>>>-  
>>>  
>>>At the end of each "stage", there is an adder (a big calculator) which  
>adds  
>>>all the numbers from the individual tracks that are routed to this "adder".  
>>>  
>>>The numbers are kept in the 80-bit registers and then brought back to  
>32bit  
>>>float.  
>>>This process of bringing back the numbers from 80-bit (and more) to 32bit  
>>>is kept to an absolute minimum.  
>>>This adding/bringing back to 32bit is done at 3 places: After a plugin  
>slot  
>>>(VST-specs for all plugin manufacturers) - Group Tracks and Master Tracks.  
>>>  
>>>  
>>>Now, as soon as you boost the volume above 0dB, you get more than 32bits.  
>>>Stay below 0dB and you will stay below 32 bits.  
>>>When the adders dump their results, the numbers are brought back from  
>any  
>>>number of bits (say 60bit) to 32 bit float.  
>>>These numbers are simply truncated which results in distortion; that's  
>the  
>>>noise/residue you find way down low.  
>>>There is an algorithm that protects us from additive errors - so these  
>>errors  
>>>can never come into the audible range.  
>>>So, as soon as you go over 0dB, you will see these kind of artifacts.

>>>  
>>>It is debatable if this needs to be dithered or not. The problem -still  
>>is-  
>>>that it is very difficult to dither in a Floating Point environment.  
>>>Fact remains that the error shouldn't be bigger than 2 to 3 LSB's.  
>>>  
>>>Is this a problem?  
>>>In real world applications: NO.  
>>>In scientific -unrealistic- tests (forcing the error): YES.  
>>>  
>>>The alternative is having a Fixed point mixer, where you already would  
>be  
>>>in trouble as soon as you boost one channel over 0dBfs. (or merge two  
>files  
>>>that are @ 0dB)  
>>>Also, this problem will be pretty much gone as soon as we switch to the  
>>64  
>>>bit engine.  
>>>

>>>  
>>>For the record, the test where Jake hears "music" as residue must be flawed.  
>>>You should hear noise/distortion from square waves.  
>>>  
>>>HTH  
>>>  
>>>Fredo  
>>>  
>>>  
>>>  
>>>  
>>>  
>>>"Dedric Terry" <dedric@echomg.com> wrote:  
>>>>I can't tell you why you hear ProTools differently than Nuendo using  
>>>a  
>>>  
>>>>single file.  
>>>>There isn't any voodoo in the software, or hidden character enhancing  
>>>>dsp.  
>>>  
>>>>I'll see if  
>>>>I can round up an M-Powered system to compare with next month.  
>>>>  
>>>>For reference, everytime I open Sequoia I think I might hear a broader,  
>>>  
>>>>clean,  
>>>>and almost flat (spectrum, not depth) sound, but I don't - it's the same  
>>>>as  
>>>>Nuendo, fwiw.  
>>>>Also I don't think what I was referring to was a theory from Chuck -  
  
>I  
>>>  
>>>>believe that was what he  
>>>>discovered in the code.  
>>>>  
>>>>Digital mixers all have different preamps and converters. Unless you  
>>>>are  
>>>>  
>>>>bypassing every  
>>>>EQ and converter and going digital in and out to the same converter when  
>>>>  
>>>>comparing, it would be hard  
>>>>to say the mix engine itself sounds different than another mixer, but  
>>>>taken  
>>>>  
>>>>as a whole, then  
>>>>certainly they may very well sound different. In addition, hardware

digital

>>>>mixers may use a variety of different paths between the I/O, channel

>>>>processing, and summing,

>>>>though most are pretty much software mixers on a single chip or set of

>>dsp's

>>>

>>>>similar to ProTools,

>>>>with I/O and a hardware surface attached.

>>>>

>>>>I know it may be hard to separate the mix engine as software in either

>>a

>>>

>>>>native DAW

>>>>or a digital mixer, from the hardware that translates the audio to something

>>>

>>>>we hear,

>>>>but that's what is required when comparing summing. The hardware can

>

>>>>significantly change

>>>>what we hear, so comparing digital mixers really isn't of as much interest

>>>

>>>>as comparing native

>>>>DAWs in that respect - unless you are looking to buy one of course.

>>>>

>>>>Even though I know you think manufacturers are trying to add something

>>to

>>>

>>>>give them an edge, I am 100%

>>>>sure that isn't the case - rather they are trying to add or change as

>little

>>>

>>>>as possible in order to give

>>>>them the edge. Their end of digital audio isn't about recreating the

>past,

>>>

>>>>but improving upon it.

>>>>As we've discussed and agreed before, the obsession with recreating

>>>>"vintage" technology is as much

>>>>fad as it is a valuable creative asset. There is no reason we shouldn't

>>>

>>>>have far superior hardware and software EQs and comps

>>>>than 20, 30 or 40 years ago. No reason at all, other than market demand,

>>>

>>>>but the majority of software, and new

>>>>hardware gear on the market has a vintage marketing tagline with it.

>>>>Companies will sell any bill of

>>>>goods if customers will buy it.  
>>>>  
>>>>There's nothing unique about the summing in Nuendo, Cubase, Sequoia/Samp,  
>>>>or Sonar, and it's pretty safe to include Logic and DP in that list as  
>>well.  
>>>  
>>>>One of the reasons I test  
>>>>these things is to be sure my DAW isn't doing something wrong, or something  
>>>  
>>>>I don't know about.  
>>>>  
>>>>Vegas - I use it for video conversions and have never done any critical  
>>>  
>>>>listening tests with it. What I have heard  
>>>>briefly didn't sound any different. It certainly looks plain vanilla  
>  
>>>>though. What you are describing is exactly  
>>>>what I would say about the GUIs of each of those apps, not that it means  
>>>  
>>>>anything. Just interesting.  
>>>>  
>>>>That's one reason I listen eyes closed and double check with phase  
>>>>cancellation tests and FFTs - I am  
>>>>influenced creatively by the GUI to some degree. I actually like Cubase  
>>>4's  
>>>>GUI better than Nuendo 3.2,  
>>>>though there are only slight visual differences (some workflow differences  
>>>  
>>>>are a definite improvement for me though).  
>>>>  
>>>>ProTools' GUI always made me want to write one dimensional soundtracks  
>>in  
>>>  
>>>>mono for public utilities, accounting offices  
>>>>or the IRS while reading my discreet systems analysis textbook - it was  
>>>also  
>>>>grey. ;-)  
>>>>  
>>>>Regards,  
>>>>Dedric  
>>>>  
>>>>"LaMont" <jjdpro@ameritech.net> wrote in message news:458c82fd\$1@linux...  
>>>>>  
>>>>> Dedric, my simple test is simple..  
>>>>> Using the same audio interface, with the same stereo file..null-ed  
to  
>>>  
>>>>> zero..No

>>>> eq, for fx. Master fader on zero..  
>>>>  
>>>> Nuendo, Pro-Tools -Mpowered(native)... yields a sonic difference that  
>>>I  
>>>> have  
>>>> referenced before.. The sound coming from PT-M has a nice top end ,  
>where  
>>>> as Neundo has a nice flatter sound quality.  
>>>> Same audio interface. M-audio 410..Using Mackies & Blue-Sky pro monitors..  
>>>>  
>>>> Same test at the big room..PT-HD & Neundo Logic Audio(macG5-Dual) Using  
>>>  
>>>> the  
>>>> 192 interface.  
>>>> Same results..But adding Logic audio's sound ..(Broad, thick)  
>>>>  
>>>> Somethings going on.  
>>>>  
>>>> Chucks post about how paris handles audio is a theory..Only Edmund  
can  
>>>  
>>>> truly  
>>>> give us the goods on what's really what..  
>>>>  
>>>> I disagree that manufactuers don;t set out o put a sonic print on their  
>>>  
>>>> products.  
>>>> I think they do.  
>>>>  
>>>> I have been fortunate to work on some digital mixers and I can tell  
>you  
>>>  
>>>> that  
>>>> each one has their own sound. The Sony Dmx-100 was modeled after SSL  
>>4000g  
>>>> (like it's Big Brother).And you what? That board (Dmx-100) sound very  
>>>warm  
>>>> and it's eq tries to behave and sound just like an SSL.. Unlike he  
Yamaha  
>>>> Dm2000(version 1.x) which has a very Clean, neutral sound..However,  
>some  
>>>> complained that it was tooo Vanila and thus, Yamaha add a version 2.0  
>>>  
>>>> which  
>>>> added Vintage type Eq's, modeled analog input gain saturation fx too  
>>give  
>>>> the user a choice Btw Clean and Neutral vs sonic Character.  
>>>>

>>>> So, if digital conoles can be given a sonic character, why not a software  
>>>> mixer?  
>>>> The truth is, there are some folks who want a neutral mixer and then  
>>there  
>>>> are others who want a sonic footprint imparted. and these can be coded  
>>>in  
>>>> the digital realm.  
>>>> The appllies with the manufactuers. They too have their vision on what  
>>>They  
>>>> think and want their product to sound.  
>>>>  
>>>> I love reading on gearslutz the posts from Plugin developers and their  
>>>  
>>>> interpretations  
>>>> and opinions about what makes their Neve 1073 Eq better and what goes  
>>>into  
>>>> making their version sound like it does.. Each Developer has a different  
>>>> vision as to what the Neve 1073 should sound like. And yet they all  
>sound  
>>>> good , but slightly different.  
>>>>  
>>>> You stated that you use Vegas. Well as you know, Vegas has a very generic  
>>>> sound..Just plain and simple. But, i bet you can tell the difference  
>>>on  
>>>> your system when you play that same file in Nuendo (No, fx, eq,  
>>>> null-edzerro)..  
>>>> ???  
>>>>  
>>>>  
>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>Lamont - what is the output chain you are using for each app when  
>>>>>comparing  
>>>>>  
>>>>>the file in Nuendo  
>>>>>vs ProTools? On the same PC, I presume (and is this PT HD or M-Powered?)?  
>>>>>Since these can't use the same output driver, you would have to depend  
>>>on  
>>>>>  
>>>>>the D/A being  
>>>>>the same, but clocking will be different unless you have a master clock,  
>>>> and  
>>>>>both interfaces  
>>>>>are locking with the same accuracy. This was one of the issues that  
>>came  
>>>> up  
>>>>>at Lynn Fuston's  
>>>>>D/A converter shootout - when do you lock to external clock and incur  
>>>the

>>>>>  
>>>>>resulting jitter,  
>>>>>and when do you trust the internal clock - and if you do lock externally,  
>>>>>  
>>>>>how good is the PLL  
>>>>>in the slave device? These issues can cause audible changes in the  
>top  
>>>>> end  
>>>>>that have nothing to do  
>>>>>with the software itself. If you say that PTHD through the same converter  
>>>>>  
>>>>>output as Nuendo (via? RME?  
>>>>>Lynx?) using the same master clock, sounds different playing a single  
>>>  
>>>>>audio  
>>>>>  
>>>>>file, then I take your word  
>>>>>for it. I can't tell you why that is happening - only that an audible  
>>>>>difference really shouldn't happen due  
>>>>>to the software alone - not with a single audio file, esp. since I've  
>>>  
>>>>>heard  
>>>>>  
>>>>>and seen PTHD audio cancel with  
>>>>>native DAWs. Just passing a single 16 or 24 bit track down the buss  
>>>to  
>>>>> the  
>>>>>output driver should  
>>>>>be, and usually is, completely transparent, bit for bit.  
>>>>>  
>>>>>The same audio file played through the same converters should only  
sound  
>>>>>  
>>>>>different if something in  
>>>>>the chain is different - be it clocking, gain or some degree of  
>>>>>unintended,  
>>>>>  
>>>>>errant dsp processing. Every DAW should  
>>>>>pass a single audio file without altering a single bit. That's a basic  
>>>  
>>>>>level  
>>>>>  
>>>>>of accuracy we should always  
>>>>>expect of any DAW. If that accuracy isn't there, you can be sure a  
>heavy  
>>>>>  
>>>>>mix will be altered in ways you  
>>>>>didn't intend, even though you would end up mixing with that factor



>in  
>>>  
>>>>>place  
>>>>>  
>>>>>(e.g. you still mix for what  
>>>>>you want to hear regardless of what the platform does to each audio  
>track  
>>>>> or  
>>>>>channel).  
>>>>>  
>>>>>In fact you should be able to send a stereo audio track out SPDIF or  
>>>>>lightpipe to another DAW, record it  
>>>>>bring the recorded file back in, line them up to the first bit, and  
>have  
>>>>>  
>>>>>them cancel on and inverted phase  
>>>>>test. I did this with Nuendo and Cubase 4 on separate machines just  
>>to  
>>>>> be  
>>>>>sure my master clocking and  
>>>>>slave sync was accurate - it worked perfectly.  
>>>>>  
>>>>>Also be sure there isn't a variation in the gain even by 0.1 dB between  
>>>>> the  
>>>>>two. There shouldn't  
>>>>>and I wouldn't expect there to be one. Also could PT be set for a  
>>>>>different  
>>>>>  
>>>>>pan law? Shouldn't make a  
>>>>>difference even if comparing two mono panned files to their stereo  
>>>>>interleaved equivalent, but for sake  
>>>>>of completeness it's worth checking as well. A variation in the output  
>>>>>  
>>>>>chain, be it drivers, audio card  
>>>>>card, or converters would be the most likely culprit here.  
>>>>>  
>>>>>The reason DAW manufacturers wouldn't add any sonic "character"  
>>>>>intentionally is that the  
>>>>>ultimate goal from day one with recording has been to accurately reproduce  
>>>>>  
>>>>>what we hear.  
>>>>>We developed a musical penchant for sonic character because the hardware  
>>>>>  
>>>>>just wasn't accurate,  
>>>>>and what it did often sent us down new creative paths - even if by  
force  
>>>>> -  
>>>>>and we decided it was

>>>>>preferred that way.  
>>>>>  
>>>>>Your point about what goes into the feature presets to sell synths  
is  
>>>  
>>>>>right  
>>>>>  
>>>>>for sure, but synths are about  
>>>>>character and getting that "perfect piano" or crystal clear bell pad,  
>>>or  
>>>>> fat  
>>>>>punchy bass without spending  
>>>>>a mint on development, adding 50G onboard sample libraries, or costing  
>>>  
>>>>>\$15k,  
>>>>>  
>>>>>so what they  
>>>>>lack in actual synthesis capabilities, they make up with EQ and effects  
>>>>> on  
>>>>>the output. That's been the case  
>>>>>for years, at least since we had effects on synths at least. But even  
>>>  
>>>>>with  
>>>>>  
>>>>>modern synths such as the Fantom,  
>>>>>Tritons, etc, which are great synths all around, of course the coolest,  
>>>>>  
>>>>>widest and biggest patches  
>>>>>will make the biggest impression - so in come the EQs, limiters, comps,  
>>>>>  
>>>>>reverbs, chorus, etc. The best  
>>>>>way to find out if a synth is really good is to bypass all effects  
and  
>>>see  
>>>>>  
>>>>>what happens. Most are pretty  
>>>>>good these days, but about half the time, there are presets that fall  
>>>>>completely flat in fx bypass.  
>>>>>  
>>>>>DAWs aren't designed to put a sonic fingerprint on a sound the way  
synths  
>>>>>  
>>>>>are - they are designed  
>>>>>to \*not\* add anything - to pass through what we create as users, with  
>>>no  
>>>>>  
>>>>>alteration (or as little as possible)  
>>>>>beyond what we add with intentional processing (EQ, comps, etc).

>>>>>Developers  
>>>>>  
>>>>>would find no pride  
>>>>>in hearing that their DAW sounds anything different than whatever is  
>>being  
>>>>>  
>>>>>played back in it,  
>>>>>and the concept is contrary to what AES and IEEE proceedings on the  
>issue  
>>>>>  
>>>>>propose in general  
>>>>>digital audio discussions, white papers, etc.  
>>>>>  
>>>>>What ID ended up doing with Paris (at least from what I gather per  
Chuck's  
>>>>>  
>>>>>findings - so correct me if I'm missing part of the equation Chuck),  
>>>>>is drop the track gain by 20dB or so, then added it back at the master  
>>>  
>>>>>buss  
>>>>>  
>>>>>to create the effect of headroom (probably  
>>>>>because the master buss is really summing on the card, and they have  
>>more  
>>>>>  
>>>>>headroom there than on the tracks  
>>>>>where native plugins might be used). I don't know if Paris passed 32-bit  
>>>>>  
>>>>>float files to the EDS card, but sort of  
>>>>>doubt it. I think Chuck has clarified this at one point, but don't  
>recall  
>>>>>  
>>>>>the answer.  
>>>>>  
>>>>>Also what Paris did is use a greater bit depth on the hardware than  
>  
>>>>>ProTools  
>>>>>  
>>>>>did - at the time PT was just  
>>>>>bring Mix+ systems to market, or they had been out for a year or two  
>>(if  
>>>>> I  
>>>>>have my timeline right) - they  
>>>>>were 24-bit fixed all the way through. Logic and Cubase were native  
>>DAWs,  
>>>>>  
>>>>>but native was still too slow  
>>>>>to compete with hardware hybrids. Paris trumped them all by running

>>  
>>>>>32-bit  
>>>>>  
>>>>>float natively (not new really, but  
>>>>>better than sticking to 24-bit) and 56 or so bits in hardware instead  
>>>>>of  
>>>>>  
>>>>>going to Motorola DSPs at 24.  
>>>>>The onboard effects were also a step up from anything out there, so  
>the  
>>>>> demo  
>>>>>did sound good.  
>>>>>I don't recall which, but one of the demos, imho, wasn't so good (some  
>>>>>sloppy production and  
>>>>>vocals in spots, IIRC), so I only listened to it once. ;-)  
>>>>>  
>>>>>Coupled with the gain drop and buss makeup, this all gave it a "headroom"  
>>>>> no  
>>>>>one else had. With very nice  
>>>>>onboard effects, Paris jumped ahead of anything else out there easily,  
>>>and  
>>>>>  
>>>>>still respectably holds its' own today  
>>>>>in that department.  
>>>>>  
>>>>>Most demos I hear (when I listen to them) vary in quality, usually  
not  
>>>>>so  
>>>>>  
>>>>>great in some area. But if a demo does  
>>>>>sound great, then it at least says that the product is capable of  
at  
>>>>>  
>>>>>least  
>>>>>  
>>>>>that level of performance, and it can  
>>>>>only help improve a prospective buyer's impression of it.  
>>>>>  
>>>>>Regards,  
>>>>>Dedric  
>>>>>  
>>>>>"LaMont " <jjdpro@ameritech.net> wrote in message news:458c14c0\$1@linux...  
>>>>>>  
>>>>>> Dedric good post..  
>>>>>>  
>>>>>> However, I have PT-M-Powered/M-audio 410 interface for my laptop  
and  
>>>>>>it

>>>>  
>>>>>> has  
>>>>>> that same sound (no eq, zero fader) that HD does. I know their use  
>>the  
>>>>  
>>>>>> same  
>>>>>> 48 bit fix mixer. I load up the same file in Nuendo (no eq, zero  
>>>>>> fader)..results.  
>>>>>> different sonic character.  
>>>>>>  
>>>>>> PT having a top end touch..Nuendo, nice smooth(flat) sound. And I'm  
>>>just  
>>>>>> taking about a stereo wav file nulled with no eq..nothing  
>>>>>> ..zilch..nada..  
>>>>>>  
>>>>>> Now, there are devices (keyboards, dum machines) on the market today  
>>>  
>>>>>> that  
>>>>>> have a Master Buss Compressor and EQ set to on with the top end notched  
>>>>  
>>>>>> up.  
>>>>>> Why? because it gives their product an competitive advantageover  
the  
>>>>>> competition..  
>>>>>> Ex: Yahama's Motif ES, Akai's MPC 1000, 2500, Roland's Fantom.  
>>>>>>  
>>>>>> So, why would'nt a DAW manufactuer code in an extra (oommf) to make  
>>>  
>>>>>> their  
>>>>>> DAW sound better. Especially, given the "I hate Digital Summing" crowd?  
>>>>>  
>>>>>> And,  
>>>>>> If I'm a DAW manufactuer, what would give my product a sonic edge  
>over  
>>>>> the  
>>>>>> competition?  
>>>>>>  
>>>>>> We live in the "louder is better" audio world these days, so a DAW  
>>that  
>>>>>  
>>>>>>> can  
>>>>>>> catch my attention 'sonically" will probaly will get the sell. That's  
>>>>> what  
>>>>>>> happend to me back in 1997 when I heard Paris. I was floored!!! Still  
>>>>> to  
>>>>>>> this day, nothing has floored me like that "Road House Blues Demo"  
>>I  
>>>

>>>>>> heard  
>>>>>> on Paris.  
>>>>>>  
>>>>>> Was it the hardware ? was it the software. I remember talking with  
>>  
>>>>>> Edmund  
>>>>>> at the 2000 winter Namm, and told me that he & Steve set out to  
>>>>>> reproduce  
>>>>>> the sonics of big buck analog board (eq's) and all.. And, summing  
>was  
>>>>> a  
>>>>>> big  
>>>>>> big issue for them because they (ID) thought that nobody has gotten  
>>>>>> it(summing)  
>>>>>> right. And by right, they meant, behaved like a console with a wide  
>>>lane  
>>>>>> for all of those tracks..  
>>>>>>  
>>>>>>  
>>>>>>  
>>>>>>  
>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>"LaMont" <jjdpro@ameritech.net> wrote in message  
>>>>>>>news:458be8d5\$1@linux...  
>>>>>>>  
>>>>>>> Okay...  
>>>>>>> I guess what I'm saying is this:  
>>>>>>>  
>>>>>>> -Is it possible that diferent DAW manufactuers "code" their app  
>>>>>>> differently  
>>>>>>> for sound results.  
>>>>>>>  
>>>>>>>Of course it is \*possible\* to do this, but only if the DAW has a  
  
>>>>>>>specific  
>>>>>>>  
>>>>>>>sound shaping purpose  
>>>>>>>beyond normal summing/mixing. Users talk about wanting developers  
>>to  
>>>>> add  
>>>>>> a  
>>>>>>>"Neve sound" or "API sound" option to summing engines,  
>>>>>>>but that's really impractical given the amount of dsp required to  
>make  
>>>>> a  
>>>>>>>  
>>>>>>>decent emulation (with convolution, dynamic EQ functions,  
>>>>>>>etc). For sake of not eating up all cpu processing, that could likely

>>>>  
>>>>>>>only  
>>>>>>>  
>>>>>>>surface as is a built in EQ, which  
>>>>>>>no one wants universally in summing, and anyone can add at will already.  
>>>>>>>  
>>>>>>>So it hasn't happened yet and isn't likely to as it detours from  
the  
>>>  
>>>>>>>basic  
>>>>>>>  
>>>>>>>tenant of audio recording - recreate what comes in as  
>>>>>>>accurately as possible.  
>>>>>>>  
>>>>>>>What Digi did in recoding their summing engine was try to recover  
>some  
>>>>>>>of the damage done by the 24-bit buss in Mix systems. Motorola 56k  
>>dsps  
>>>>>>> are  
>>>>>>>24-bit fixed point chips and I think  
>>>>>>>the new generation (321?) still is, but they use double words now  
>for  
>>>>>>>48-bits). And though plugins could process at 48-bit by  
>>>>>>>doubling up and using upper and lower 24-bit words for 48-bit outputs,  
>>>>> the  
>>>>>>>  
>>>>>>>buss  
>>>>>>>between chips was 24-bits, so they had to dither to 24-bits after  
>every  
>>>>>>>  
>>>>>>>plugin. The mixer (if I recall correctly) also  
>>>>>>>had a 24-bit buss, so what Digi did is to add a dither stage to the  
>>>  
>>>>>>>mixer  
>>>>>>> to  
>>>>>>>prevent this  
>>>>>>>constant truncation of data. 24-bits isn't enough to cover summing  
>>>for  
>>>>>>> more  
>>>>>>>than a few tracks without  
>>>>>>>losing information in the 16-bit world, and in the 24-bit world some  
>>>>>>>information will be lost, at least at the lowest levels.  
>>>>>>>  
>>>>>>>Adding a dither stage (though I think they did more than that - perhaps  
>>>>>>>  
>>>>>>>implement a 48-bit double word stage as well),  
>>>>>>>simply smoothed over the truncation that was happening, but it didn't  
>>>>>

>>>>>>>solve  
>>>>>>>  
>>>>>>>the problem, so with HD  
>>>>>>>they went to a double-word path - throughout I believe, including  
>the  
>>>>> path  
>>>>>>>  
>>>>>>>between chips. I believe the chips  
>>>>>>>are still 24-bit, but by doubling up the processing (yes at a cost  
>>of  
>>>>>>>  
>>>>>>>twice  
>>>>>>>  
>>>>>>>the overhead), they get a 48-bit engine.  
>>>>>>>This not only provided better headroom, but greater resolution.  
Higher  
>>>>>>> bit  
>>>>>>>depths subdivide the amplitude with greater resolution, and that's  
>>>>>>>really where we get the definition of dynamic range - by lowering  
>the  
>>>>>>>  
>>>>>>>signal  
>>>>>>>  
>>>>>>>to quantization noise ratio.  
>>>>>>>  
>>>>>>>With DAWs that use 32-bit floating point math all the way through,  
>>the  
>>>>>>>  
>>>>>>>only  
>>>>>>>  
>>>>>>>reason for altering the summing  
>>>>>>>is by error, and that's an error that would actually be hard to make  
>>>and  
>>>>>>> get  
>>>>>>>past a very basic alpha stage of testing.  
>>>>>>>There is a small difference in fixed point math and floating point  
>>math,  
>>>>>>> or  
>>>>>>>at least a theoretical difference in how it affects audio  
>>>>>>>in certain cases, but not necessarily in the result for calculating  
>>>gain  
>>>>>>> in  
>>>>>>>either for the same audio file. Where any differences might show  
>up  
>>>is  
>>>>>>>  
>>>>>>>complicated, and I believe only appear at levels below 24-bit (or  
>in



>>>>>>>headroom with tracks pushed beyond 0dBFS), or when/if  
>>>>>>>there are any differences in where each amplitude level is quantized.  
>>>>>>>  
>>>>>>>Obviously there can be differences if the DAW has to use varying  
bit  
>>>>>>>depths  
>>>>>>>  
>>>>>>>throughout a single summing path to accommodate hardware  
>>>>>>>as well as software summing, since there may be truncation or rounding  
>>>>>>>  
>>>>>>>along  
>>>>>>>  
>>>>>>>the way, but that impacts the lowest bit  
>>>>>>>level, and hence - spatial reproduction, reverb tails perhaps, and  
>>>>>>>"depth",  
>>>>>>>  
>>>>>>>not the levels most music so the differences are most  
>>>>>>>often more subtle than not. But most modern DAWs have eliminated  
>those  
>>>>>>>  
>>>>>>>"rough edges" in the math by increasing the bit depth to accommodate  
>>>>>>>  
>>>>>>>normal  
>>>>>>>  
>>>>>>>summing required for mixing audio.  
>>>>>>>  
>>>>>>>So with Lynn's unity gain summing test (A files on the CD I believe),  
>>>>>>> DAWs  
>>>>>>>  
>>>>>>>were never asked to sum beyond 24-bits,  
>>>>>>>at least not on the upper end of the dynamic range, so everything  
>that  
>>>>>>>  
>>>>>>>could  
>>>>>>>  
>>>>>>>represent 24-bits accurately would cancel. The only ones  
>>>>>>>that didn't were ones that had a different bit depth and/or gain  
  
>>>>>>>structure  
>>>>>>>  
>>>>>>>whether hybrid or native  
>>>>>>>(e.g. Paris' subtracting 20dB from tracks and adding it to the buss).  
>>>>>>> In  
>>>>>>>  
>>>>>>>this case, PTHD cancelled (when I tested it) with  
>>>>>>>Nuendo, Samplitude, Logic, etc because the impact of the 48-bit fixed  
>>>>>>> vs.  
>>>>>>>

>>>>>>>32-bit float wasn't a factor.  
>>>>>>>  
>>>>>>>When trying other tests, even when adding and subtracting gain, Nuendo,  
>>>>>>>  
>>>>>>>Sequoia and Sonar cancel - both audibly and  
>>>>>>>visually at inaudible levels, which only proves that one isn't making  
>>>>> an  
>>>>>>>  
>>>>>>>error when calculating basic gain. Since a dB is well defined,  
>>>>>>>and the math to add gain is simple, they shouldn't. The fact that  
>>they  
>>>>>>> all  
>>>>>>>use 32-bit float all the way through eliminates a difference  
>>>>>>>in data structure as well, and this just verifies that. There was  
>>a  
>>>  
>>>>>>>time  
>>>>>>>  
>>>>>>>that supposedly Logic (v3, v4?) was partly 24-bit, or so the rumor  
>>went,  
>>>>>>>but it's 32-bit float all the way through now just as Sonar,  
>>>>>>>Nuendo/Cubase,  
>>>>>>>  
>>>>>>>Samplitude/Sequoia, DP, Audition (I presume at least).  
>>>>>>>I don't know what Acid or Live use. Saw promotes a fixed point engine,  
>>>>>>> but  
>>>>>>>I don't know if it is still 24-bit, or now 48 bit.  
>>>>>>>That was an intentional choice by the developer, but he's the only  
>>one  
>>>>> I  
>>>>>>>  
>>>>>>>>know of that stuck with 24-bit for summing  
>>>>>>>>intentionally, esp. after the Digi Mix system mixer incident.  
>>>>>>>>  
>>>>>>>>Long answer, but to sum up, it is certainly physically \*possible\*  
>for  
>>>>> a  
>>>>>>>>  
>>>>>>>>developer to code something differently intentionally, but not  
>>>>>>>>in reality likely since it would be breaking some basic fixed point  
>>>>or  
>>>>>>>>floating point math rules. Where the differences really  
>>>>>>>>showed up in the past is with PT Mix systems where the limitation  
>was  
>>>>>>>>  
>>>>>>>>really  
>>>>>>>>  
>>>>>>>>significant - e.g. 24 bit with truncation at several stages.

>>>>>>>  
>>>>>>>That really isn't such an issue anymore. Given the differences in  
>>>>>>>workflow,  
>>>>>>>  
>>>>>>>missing something in workflow or layout differences  
>>>>>>>is easy enough to do (e.g. Sonar doesn't have group and busses the  
>>way  
>>>>>>>Nuendo does, as it's outputs are actually driver outputs,  
>>>>>>>not software busses, so in Sonar, busses are actually outputs, and  
>>sub  
>>>>>>>busses are actually busses in Nuendo. There are no,  
>>>>>>>or at least I haven't found the equivalent of a Nuendo group in Sonar  
>>>>> -  
>>>>>>> that  
>>>>>>>affects the results of some tests (though not basic  
>>>>>>>summing) if not taken into account, but when taken into account,  
they  
>>>>> work  
>>>>>>>  
>>>>>>>exactly the same way).  
>>>>>>>  
>>>>>>>So at least when talking about apps with 32-bit float all the way  
>  
>>>>>>>through,  
>>>>>>>  
>>>>>>>it's safe to say (since it has been proven) that summing isn't different  
>>>>>>>  
>>>>>>>unless  
>>>>>>>there is an error somewhere, or variation in how the user duplicates  
>>>the  
>>>>>>>  
>>>>>>>same mix in two different apps.  
>>>>>>>  
>>>>>>>Imho, that's actually a very good thing - approaching a more consistent  
>>>>>>>  
>>>>>>>basis for recording and mixing from which users can make all  
>>>>>>>of the decisions as to how the final product will sound and not be  
>>>>>>>required  
>>>>>>>  
>>>>>>>to decide when purchasing a pricey console, and have to  
>>>>>>>focus their business on clients who want "that sound". I believe  
>we  
>>>are  
>>>>>>>  
>>>>>>>actually closer to the pure definition of recording now than  
>>>>>>>we once were.  
>>>>>>>  
>>>>>>>Regards,

>>>>>>>Dedric  
>>>>>>>  
>>>>>>>  
>>>>>>>  
>>>>>>> I the answer is yes, then,the real task is to discover or rather  
>>>>>>> un-cover  
>>>>>>> what's say: Motu's vision of summing, versus Digidesign, versus  
>>>>>>> Steinberg  
>>>>>>> and so on..  
>>>>>>>  
>>>>>>> What's under the hood. To me and others,when Digi re-coded their  
>>  
>>>>>>> summing  
>>>>>>> engine, it was obvious that Pro Tools has an obvious top end (8k-10k)  
>>>>>>>  
>>>>>>> bump.  
>>>>>>> Where as Steinberg's summing is very neutral.  
>>>>>>>  
>>>>>>> "Dedric Terry" <dedric@echomg.com> wrote:  
>>>>>>>>Hi Neil,  
>>>>>>>>  
>>>>>>>>Jamie is right. And you aren't wacked out - you are thinking this  
>>>>>>>>through  
>>>>>>>>  
>>>>>>>>in a reasonable manner, but coming to the wrong  
>>>>>>>>conclusion - easy to do given how confusing digital audio can be.  
>>>  
>>>>>>>>Each  
>>>>>>>> word  
>>>>>>>>represents an amplitude  
>>>>>>>>point on a single curve that is changing over time, and can vary  
>>with  
>>>>>>>> a  
>>>>>>>>  
>>>>>>>>>speed up to the Nyquist frequency (as Jamie described).  
>>>>>>>>>The complex harmonic content we hear is actually the frequency  
>>>>>>>>>modulation  
>>>>>>>>> of  
>>>>>>>>>a single waveform,  
>>>>>>>>>that over a small amount of time creates the sound we translate  
>-  
>>>we  
>>>>  
>>>>>>>>>don't  
>>>>>>>>>  
>>>>>>>>>really hear a single sample at a time,  
>>>>>>>>>but thousands of samples at a time (1 sample alone could at most  
>>>>>>>>>represent

>>>>>>>> a  
>>>>>>>>single positive or negative peak  
>>>>>>>>of a 22,050Hz waveform).  
>>>>>>>>  
>>>>>>>>If one bit doesn't cancel, esp. if it's a higher order bit than  
>number  
>>>>>>> 24,  
>>>>>>>>  
>>>>>>>>you may hear, and will see that easily,  
>>>>>>>>and the higher the bit in the dynamic range (higher order) the  
more  
>>>>>>>>audible  
>>>>>>>>  
>>>>>>>>the difference.  
>>>>>>>>Since each bit is 6dB of dynamic range, you can extrapolate how  
>"loud"  
>>>>>>>>  
>>>>>>>>that  
>>>>>>>>  
>>>>>>>>bit's impact will be  
>>>>>>>>if there is a variation.  
>>>>>>>>  
>>>>>>>>Now, obviously if we are talking about 1 sample in a 44.1k rate  
>song,  
>>>>>>>> then  
>>>>>>>>  
>>>>>>>>it simply be a  
>>>>>>>>click (only audible if it's a high enough order bit) instead of  
>an  
>>>>>>>>obvious  
>>>>>>>>  
>>>>>>>>musical difference, but that should never  
>>>>>>>>happen in a phase cancellation test between identical files higher  
>>>  
>>>>>>>>than  
>>>>>>>> bit  
>>>>>>>>24, unless there are clock sync problems,  
>>>>>>>>driver issues, or the DAW is an early alpha version. :-)  
>>>>>>>>  
>>>>>>>>By definition of what DAWs do during playback and record, every  
>audio  
>>>>>>>>  
>>>>>>>>stream  
>>>>>>>>  
>>>>>>>>has the same point in time (judged by the timeline)  
>>>>>>>>played back sample accurately, one word at a time, at whatever  
>sample  
>>>>>>>>

>>>>>>>>>rate  
>>>>>>>>>  
>>>>>>>>>we are using. A phase cancellation test uses that  
>>>>>>>>>fact to compare two audio files word for word (and hence bit for  
>>bit  
>>>>>  
>>>>>>>>>since  
>>>>>>>>>  
>>>>>>>>>each bit of a 24-bit word would  
>>>>>>>>>be at the same bit slot in each 24-bit word). Assuming they are  
>>  
>>>>>>>>>aligned  
>>>>>>>>> to  
>>>>>>>>>the same start point, sample  
>>>>>>>>>accurately, and both are the same set of sample words at each sample  
>>>>>>>>>point,  
>>>>>>>>>  
>>>>>>>>>bit for bit, and one is phase inverted,  
>>>>>>>>>they will cancel through all 24 bits. For two files to cancel  
>>>>>>>>>completely  
>>>>>>>>>  
>>>>>>>>>for the duration of the file, each and every bit in each word  
>>>>>>>>>must be the exact opposite of that same bit position in a word  
at  
>>>the  
>>>>>> same  
>>>>>>>>>  
>>>>>>>>>sample point. This is why zooming in on an FFT  
>>>>>>>>>of the full difference file is valuable as it can show any differences  
>>>>>>>>> in  
>>>>>>>>>  
>>>>>>>>>the lower order bits that wouldn't be audible. So even if  
>>>>>>>>>there is no audible difference, the visual followup will show if  
>>the  
>>>>> two  
>>>>>>>>>  
>>>>>>>>>files truly cancel even a levels below hearing, or  
>>>>>>>>>outside of a frequency change that we will perceive.  
>>>>>>>>>  
>>>>>>>>>When they don't cancel, usually there will be way more than 1 bit  
>>>>>>>>>difference - it's usually one or more bits in the words for  
>>>>>>>>>thousands of samples. From a musical standpoint this is usually  
>>in  
>>>>> a  
>>>>>>>>>frequency range (low freq, or high freq most often) - that will  
>>>>>>>>>show up as the difference between them, and that usually happens  
>>due  
>>>>> to



