
Subject: Re: Faightlight Core II: Dream System
Posted by [DJ](#) on Fri, 17 Nov 2006 15:46:01 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.
>>>>>>
>>>>>> 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

Subject: Faightlight Core II: Dream System
Posted by [LaMont](#) on Fri, 17 Nov 2006 16:14:43 GMT
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;>>>
>>>>> 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
>>>

Subject: Re: Faightlight Core II: Dream System
Posted by [LaMont](#) on Fri, 17 Nov 2006 16:42:43 GMT
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>>>>>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
>>>>>
>>>>>"r

Subject: Re: Faightlight Core II: Dream System
Posted by [TCB](#) on Fri, 17 Nov 2006 16:48:36 GMT
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ough 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 o

Subject: Re: Faightlight Core II: Dream System
Posted by [LaMont](#) on Fri, 17 Nov 2006 16:53:34 GMT
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;>>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,

Subject: Re: Faightlight Core II: Dream System; AES 2006 Core LinksII
Posted by [LAMont\[3\]](#) on Fri, 17 Nov 2006 17:16:07 GMT
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/>
>>>>>
>>>>>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

Subject: Re: Faightlight Core II: Dream System
Posted by [duncan](#) on Fri, 17 Nov 2006 17:39:52 GMT
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t;>>>
>>>>>>>>> Neil
>>>>>>>>>
>>>>>>>>>
>>>>>>>>>
>>>>>>>>>

>>>>>

>>>>>

>>>>

>>>>

>>>

>>

>>

>This has been posted several places, but just in case you missed it.

HO, HO, HO

<http://xmas.daileyads.com/>>am I going to have to
toss out 30 bucks per cable for the Monster lightpipe ones they
seem to favor - GEE, WONDER WHY? <

Radio Shack may have RCA-F>BNC-M adapters. If you've got a s/pdif cable
that is long enough, this will do the job.

voice of experience

I would gladly e-mail Tom my allkeys file but it's not for a pro card. I've
got 2 x project cards and a "home" card right now.....;o(

"Neil" <OIUOIU@OIU.com> wrote in message news:458d53df\$1@linux...

>

> Nope, no automated way that I'm aware of.

>

> I think they should e-mail those out the moment you place your
> order - it's not like you can use them without the card!

>

> Anyway, if you REALLLLY want to try the card out, you can
> always enter the keys manually... they're located inside the
> front cover of the &

Subject: Re: Faightlight Core II: Dream System
Posted by [LaMont](#) on Fri, 17 Nov 2006 19:52:46 GMT
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quot;manual". It'll take you at least a half-

> hour & I got it wrong because at least a couple of the module
> names don't match what the software calls them, so it's
> confusing & you have to take a guess... I guessed wrong.

>

> Or maybe DeeJ could send you a copy of one of HIS allkeys files
> from his Pro Cards & you could see if it works on yours! lol

>
 > Me, I'm going to be taking the Pulsar Project card out of my
 > Cubase rig today & installing it in my Paris PC to see if I can
 > get it to clock properly at 88.2k if it's in a different PC
 > than my RME cards, and then run some summing tests (that Lamont
 > can scorn for being "rigged" LOL!) to see if summing 4x stereo
 > submixes out of my Multifaces via lightpipe will make any kind
 > of difference vs. summing in Paris with the same # of submixes
 > via analog outs into the Paris 8-in module. Of course, my two
 > current lightpipe "cables" are not long enough to reach, so
 > I'll need to go down to my local Guitar Center & see if they
 > have anything long enough (and if they do, am I going to have to
 > toss out 30 bucks per cable for the Monster lightpipe ones they
 > seem to favor - GEE, WONDER WHY? - or if they have something
 > more reasonably-priced... oh well). And then the question
 > becomes: can I run the Pulsar stuff as a stand-alone app on
 > that PC, or will I have to install the CubaseLE software that
 > I got with a Lexicon Alpha interface, which I bought solely for
 > the Lexicon Pantheon reverb that came bundled with it? And if I
 > DO need to install that, will it work on WinME (which is what
 > my Paris PC is running)?
 >
 > OMIGOD, I just scared the shit out of myself... that looks
 > EXACTLY like something DeeJ would post!
 >
 > lol

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [LaMont](#) on Fri, 17 Nov 2006 22:08:56 GMT

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```
> > <DIV><FONT face=3D3DArial size=3D3D2>I picked a great day to =
>>install the =3D
>> >Pro card . .=3D20
>> > .</FONT></DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2></FONT> </DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2>Hurry up and =
>>wait.</FONT></DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2></FONT> </DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2>Now, Cubase 4 ? ? ? Should =
>>I=3D20
>> > wait?</FONT></DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2></FONT> </DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2> =3D
>> >
>> > Naw, well maybe . . .</FONT></DIV>
```

```
>> > <DIV><FONT face=3D3DArial size=3D3D2></FONT> </DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2></FONT> </DIV>
>> > <DIV><FONT face=3D3DArial size=3D3D2>NOT!</FONT></DIV>
>> > <DIV><FONT size=3D3D2><BR><BR>I choose Polesoft Lockspam to fight =
>>spam,
>> =3D
>> >and=3D20
>> > you?<BR><A=3D20
>> > =3D
>> =
>>>href=3D3D"http://www.polesoft.com/refer.html">http://www.polesoft.com/re=
>>fer=3D
>> >.html</A> </FONT></DIV></BLOCKQUOTE></BODY></HTML>
>> >
>> >
>>
>>
>><!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
>><HTML><HEAD>
>><META http-equiv=3DContent-Type content=3D"text/html; =
>>charset=3Diso-8859-1">
>>&l
```

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [Nil](#) on Fri, 17 Nov 2006 22:30:26 GMT

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```
solid; MARGIN-RIGHT: 0px">
>> <DIV>"Neil" <<A href=3D"mailto:IOUOI@OIU.com">IOUOI@OIU.com</A>> =
>>wrote in=20
>> message <A=20
>> =
>>href=3D"news:458d4771$1@linux">news:458d4771$1@linux</A>...</DIV><BR>I'm
> =
>>sure=20
>> it's that he can't get the "allkeys" file.<BR><BR>Tom, did you e-mail=20
>> Ali? (<A =
>>href=3D"mailto:info@creamware.com">
```

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [LaMontt](#) on Fri, 17 Nov 2006 22:37:51 GMT

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info@creamware.com) &=20
>> give him your
card's SN#?

Neil

"DJ" <<A=20
>> href=3D"mailto:nowayjose@dude.net">nowayjose@dude.net>=20
>> wrote:
>
>
>So, do you have it there and you are =
>>having=20
>> problems with it?=3D20
>
>Deej
> "Tom Bruhl" =
>><<A=20
>> href=3D"mailto:arpeggio@comcast.net">arpeggio@comcast.net> wrote =
>>in message=20
>> =3D
>news:458cd310@linux...
> I got things really =
>>cooking here=20
>> with my new rig except the

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [Neil](#) on Fri, 17 Nov 2006 23:03:58 GMT

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>> Creamware folks are on =
>>vacation from=20
>> today until 1/2/07.=3D20
> I picked a great day to install =
>>the Pro=20
>> card . . .
>
> Hurry up and =
>>wait.
>
> Now,=20
>> Cubase 4 ? ? ? Should I=20
>> =
>>wait?
>
> &nbs=
>>p;=20
>> Naw, well maybe . . .
>
>
> =20
>> NOT!
>
>
> I choose Polesoft Lockspam to fight =
>>spam,=20
>> and you?
> <A=20
>> =
>>href=3D"http://www.polesoft.com/refer.html">http://www.polesoft.com/refer=
>>.html =20
>>
>
><!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0=20
>> Transitional//EN">
><HTML><HEAD>
><META=20
>> http-equiv=3D3DContent-Type content=3D3D"text/html;=20
>> =3D
>charset=3D3Diso-8859-1">
><META =
>>content=3D3D"MSHTML=20
>> 6.00.2900.2180"=20
>> =
>>name=3D3DGENERATOR>
><STYLE></STYLE>
></HEA=
>>D>
><BODY=20
>> bgColor=3D3D#ffffff>
><DIV><FONT face=3D3DArial =
>>size=3D3D2>So,=20
>> do you have it there and you are =

>>=3D
>having=3D20
>problems with it?=20
>> </DIV>
><DIV><FONT face=3D3DArial=20
>> size=3D3D2>&l

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [LaMont](#) on Sat, 18 Nov 2006 00:23:54 GMT

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a great day =
>>to install=20
>> the =3D
>Pro card . =3D20
> =20
>> .</DIV>
> <DIV><FONT =
>>face=3D3DArial=20
>> size=3D3D2> </DIV>
> =
>><DIV><FONT=20
>> face=3D3DArial size=3D3D2>Hurry up and=20
>> wait.</DIV>
> <DIV><FONT =
>>face=3D3DArial=20
>> size=3D3D2> </DIV>
> =
>><DIV><FONT=20
>> face=3D3DArial size=3D3D2>Now, Cubase 4 ? ? ? Should =
>>I=3D20
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>> wait?</DIV>
> <DIV><FONT =
>>face=3D3DArial=20
>> size=3D3D2> </DIV>
> =
>><DIV><FONT=20
>> face=3D3DArial size=3D3D2> =3D
>
> Naw, well =
>>maybe . =20
>> .</DIV>
> <DIV><FONT =
>>face=3D3DArial=20
>> size=3D3D2> </DIV>
> =
>><DIV><FONT=20
>> face=3D3DArial size=3D3D2> </DIV>
> =20
>> <DIV><FONT face=3D3DArial=20
>> size=3D3D2>NOT!</DIV>
> =
>><DIV><FONT=20
>> size=3D3D2>

I choose Polesoft Lockspam to fight=20
>> spam,
=3D
>and=3D20
> =
>>you?
<A=3D20
> =20
>> =3D
>href=3D3D"<A=20
>> =
>>href=3D'http://www.polesoft.com/refer.html">http://www.polesoft.com/refer=
>>'>http://www.polesoft.com/refer.html">http://www.polesoft.com/refer</A=
>>=3D
>.html=20
>> =
>></DIV></BLOCKQUOTE></BODY></HTML><BR=

>>>>
>
</BLOCKQUOTE></BODY></HTML>

>>

>>

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

>>am I going to have to

>toss out 30 bucks per cable for the Monster lightpipe ones they

>seem to favor - GEE, WONDER WHY? <

>

>Radio Shack may have RCA-F>BNC-M adapters. If you've got a s/pdif cable

>that is

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [Neil](#) on Sat, 18 Nov 2006 01:22:34 GMT

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d6028\$1@linux...

>

> This has been posted several places, but just in case you missed it.

> The Santa Sessions - Dailey Associates

>

> HO, HO, HO

>

> <http://xmas.daileyads.com/>

>Ohhhhhh!!!! Sorry. I was thinking WC. I have used the cheapo HOSA cables with mine. They actually were more secure because they didn't have that big adapter on the end that overlaps the brackets on the PCI slots.

worked just fine.

;o)

"Neil" <

Subject: Re: Faightlight Core II: Dream System

Posted by [Martin Harrington](#) on Sat, 18 Nov 2006 01:24:37 GMT

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t;>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.

Subject: Re: Faightlight Core II: Dream System

Posted by [Martin Harrington](#) on Sat, 18 Nov 2006 01:25:23 GMT

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/>
>>
>>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

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [Nappy](#) on Sat, 18 Nov 2006 01:50:48 GMT

to:IUOIU@OIU.com" target="_blank">IUOIU@OIU.com> wrote in message
news:458d6332\$1@linux...

>

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

>>>am I going to have to

>>toss out 30 bucks per cable for the Monster lightpipe ones they

>>seem to favor - GEE, WONDER WHY? <

>>

>>Radio Shack may have RCA-F>BNC-M adapters. If you've got a s/pdif cable

>

>>that is long enough, this will do the job.

>>

>>voice of experience

>

> No, DeeJ, I'm ging to send the audio out through Lightpipe - 4

> channels per Multiface (2 stereo submixes out of each

> Multiface's lightpipe "out", into each of the two

> lightpipe "in's" on the Pulsar card).

>

> Rat Shack's here are carrying Monster digilight cables now,

> too... profit margin must be just a LITTLE bit bigger on a \$30

> cable than on a \$5 one :D may as well go to Guitar Center

> & see if they have anything else at a lower price point (plus,

> check & see if they got anything new in stock that my gear

> sluttery just can't resist LOL!)

>

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

>Ohhhhhh!!!! Sorry. I was thinking WC. I have used the cheapo HOSA cables

>with mine. They actually were more secure because they didn't have that
big

>adapter on the end that overlaps the brackets on the PCI slots.

>

>worked just fine.

Just got back from G.C. - got the "Live Wires" ones, which were
still 30 bucks for the length I needed, but are a little more
robust than the flimsy ones for not all that much less \$.

NeilGot it..But, I can remember Edmund and Steve saying that Summing was a top
priority..

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

>

>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> 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 referenc

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for
Plugins..WOW!!

Posted by [LaMontt](#) on Sat, 18 Nov 2006 01:54:45 GMT

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e, 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

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [Neil](#) on Sat, 18 Nov 2006 02:08:11 GMT

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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
&g

Subject: Re: Faightlight Core II: Dream System

Posted by [duncan](#) on Sat, 18 Nov 2006 03:01:00 GMT

r />
>>> 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

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [LaMont](#) on Sat, 18 Nov 2006 04:34:35 GMT

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/>
>>>>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"
>>>>>

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [LaMont](#) on Sat, 18 Nov 2006 04:37:38 GMT

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;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

Subject: Re: Faightlight Core II: Dream System: Uses the Scope DSP Platform for Plugins..WOW!!

Posted by [LaMont](#) on Sat, 18 Nov 2006 04:41:49 GMT

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/>
>>>>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, et

Subject: Re: Faightlight Core II: Dream System

Posted by [DJ](#) on Sat, 18 Nov 2006 06:30:35 GMT

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C.
>>>>

>>>>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
>>>
>>&g

Subject: Re: Faightlight Core II: Dream System
Posted by [chuck duffy](#) on Sat, 18 Nov 2006 15:05:10 GMT
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kai'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" <

Subject: Re: Faightlight Core II: Dream System
Posted by [chuck duffy](#) on Sat, 18 Nov 2006 15:06:25 GMT
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:dedric@echomg.com" target="_blank">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
>
>>>>>>&g

Subject: Re: Faightlight Core II: Dream System
Posted by [Ted Gerber](#) on Sat, 18 Nov 2006 15:20:15 GMT
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t;>basic
>>>>>>
>>>>>>tenant of audio recording - recreate what comes in as
>>>>>>accurately as possible.
>>>>>>

Subject: Re: Faightlight Core II: Dream System
Posted by [Gantt Kushner](#) on Sat, 18 Nov 2006 15:21:00 GMT
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br />

>>>>>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
>>>>>

Subject: Re: Faightlight Core II: Dream System
Posted by [DJ](#) on Sat, 18 Nov 2006 15:38:52 GMT
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>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 reproduct

ion, 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,
>>>&

Subject: Re: Faightlight Core II: Dream System
Posted by [Nil](#) on Sat, 18 Nov 2006 17:49:32 GMT
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ts, 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 take

Subject: Re: Faightlight Core II: Dream System
Posted by [DJ](#) on Sat, 18 Nov 2006 19:03:39 GMT
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t;>>>>>
>>>>>>> "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,
>>>>>>>

Subject: Re: Faightlight Core II: Dream System
Posted by [Dimitrios](#) on Sat, 18 Nov 2006 20:05:31 GMT
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br />
>>>>>>>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,
 >>>>>>>>

Subject: Re: Faightlight Core II: Dream System
 Posted by [DJ](#) on Sat, 18 Nov 2006 20:37:24 GMT
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>> 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: Faightlight Core II: Dream System
Posted by [gene lennon](#) on Sat, 18 Nov 2006 20:47:22 GMT
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;>
>>>>>>>>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 a

Subject: Re: Faightlight Core II: Dream System
Posted by [Martin Harrington](#) on Sat, 18 Nov 2006 21:56:31 GMT
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it's not doing anything.
Most native plugs these days only take resources when they have something to do. I'm quite sure I could use two 14 DSP cards without trying too hard. Again, it will just involve a little time learning to manage the workflow and I'm willing to do that for synths and f/x this good.

Paired up with a UAD card it's a damned impressive system. I might spring for another one of each, using the UAD for vintage type f/x and the CW for mixing and synths. I gotta say, it's a pretty enjoyable, creative combination.

Now that I like it, we'll see CW out of business soon.

TCBBut, 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 cha

Subject: Re: Faightlight Core II: Dream System
Posted by [DJ](#) on Sun, 19 Nov 2006 04:53:40 GMT
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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:
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>>>>>comparing
>>>>
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>>>>>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
>>>>
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>>
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>>>>
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>>>>>difference really shouldn't happen due
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>>
>>>>>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
>&g

Subject: Re: Faightlight Core II: Dream System
Posted by [LaMontt](#) on Sun, 19 Nov 2006 06:24:22 GMT
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t;>>
>>>>>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,

Subject: Re: Faightlight Core II: Dream System
Posted by [Jamie K](#) on Sun, 19 Nov 2006 07:33:45 GMT
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gt;>>>>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 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"

Subject: Re: Faightlight Core II: Dream System
Posted by [Dedric Terry](#) on Sun, 19 Nov 2006 14:41:48 GMT
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;>>>>
>>>>>>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 pas

Subject: Re: Faightlight Core II: Dream System
Posted by [LaMont](#) on Sun, 19 Nov 2006 16:03:59 GMT
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t 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 ma

Subject: Re: Faightlight Core II: Dream System
Posted by [Dedric Terry](#) on Sun, 19 Nov 2006 18:34:08 GMT
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gt;>>>>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

Subject: Re: Faightlight Core II: Dream System
Posted by [neil\[1\]](#) on Sun, 19 Nov 2006 18:44:05 GMT
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der 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,
>>>>>>>>>>

Subject: Re: Faightlight Core II: Dream System
Posted by [LaMont](#) on Sun, 19 Nov 2006 19:08:07 GMT
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;>>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
>>>>>>>>>

>>>>>

>>>>

>>>

>>>

>>

>Hey Chuck, where can we find those guys..They should be coveted by evry DAW company on the planet! :)

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

>

>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> 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 compa

Subject: Re: Faightlight Core II: Dream System
Posted by [LaMont](#) on Sun, 19 Nov 2006 21:01:03 GMT
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y 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
>>>>

Subject: Re: Faightlight Core II: Dream System
Posted by [duncan](#) on Mon, 20 Nov 2006 03:17:10 GMT
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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
>>>>>>>
