Subject: Guitar - compensated nut
Posted by DC on Tue, 15 Aug 2006 23:47:54 GMT
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No, I am not talking about a politician with a Tele...

For the last 2 days I have been working on an idea for a intonated nut for guitars and basses.

Want to see something reall scary? Get a good chromatic tuner, tune all your strings to pitch. Not press down each string at the first fret and check your tuning again...

Unless you have a very lucky accident, most of the strings will be out of tune at the first fret. This is why guitars don't play in tune when changing from open to fretted notes. Yes, the bridge intonation is vitally important, but the nut being intonatable is also very important.

Today I finished installing my first made-from-scratch intonatable nut on my Anderson strat. (and no this is not the same as the Feiten tuning system).

I've got to go out for a while, but if several of you are interested, I will post the details on how to do this when I get a chance.

It works. The guitar is more in tune, by far, than ever before.

DC

Subject: Re: Guitar - compensated nut
Posted by Jamie K on Wed, 16 Aug 2006 00:01:52 GMT
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Hey DC,

Sounds cool, post away!

Cheers,
-Jamie
http://www.JamieKrutz.com

DC wrote:
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> DC
>

Subject: Re: Guitar - compensated nut
Posted by brandon[2] on Wed, 16 Aug 2006 00:15:32 GMT
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Sounds cool, but won't that make you out of tune with your band mates?

b

Jamie K <Meta@Dimensional.com> wrote:
>
>Hey DC,
>
>Sounds cool, post away!
>
>Cheers,
> -Jamie
> http://www.JamieKrutz.com
>
>

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>> DC
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Subject: Re: Guitar - compensated nut
Posted by Aaron Allen on Wed, 16 Aug 2006 00:26:27 GMT
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Very interested.. I custom slotted and filed a nut on my LP trying to get
this issue to go away on the B string... it helped, but not a complete
solution.

AA

"DC" <dc@spammersinchulavista.org> wrote in message news:44e25d2a$1@linux...
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> DC
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Subject: Re: Guitar - compensated nut
Posted by Neil on Wed, 16 Aug 2006 00:27:15 GMT
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I find that LP's can often have a tendency to be sharp on the
g-string on fretted notes... yours is the B?

What gauge strings?

Neil

"Aaron Allen" <nospam@not_here.dude> wrote:
>Very interested.. I custom slotted and filed a nut on my LP trying to get

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>> DC
>>
>
>

Subject: Re: Guitar - compensated nut
Posted by Aaron Allen on Wed, 16 Aug 2006 01:26:09 GMT
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10's. The B and G would just 'not' get along. A wound G would make things
worse no doubt about it

AA

"Neil" <OIUOIU@OIU.com> wrote in message news:44e26663$1@linux...
>
> I find that LP's can often have a tendency to be sharp on the
> g-string on fretted notes... yours is the B?
>
> What gauge strings?
>
> Neil
>
>

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>>> DC
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>>
>>
>

Subject: Re: Guitar - compensated nut
Posted by DC on Wed, 16 Aug 2006 01:36:47 GMT

Actually it keeps you more in tune, at least with keys.

Another guitar player and you, playing the same chords?

Maybe, but mostly I think it would just be you seeming to sound
better than he/she.

I am beat. I need some rest, but I will post on this soon
and put a pic or 2 up.

DC

"Brandon" <a@a.com> wrote:
>
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>
>b
>
>
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>
>
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Subject: Re: Guitar - compensated nut
Posted by audioguy_editout_ on Wed, 16 Aug 2006 04:03:54 GMT
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There is a guy in town here that has been installing
staggered nuts on Strats and Les Pauls for a few years now.
  They improve intonation in the first 6 frets, which is
where most of the problems lay. I will ask my guitar layer
bud if he can point me to some more info. He had it done on
two of his guitars and it made a big difference. Lately
though, he has been playing mostly PRS's and hasn't had the
mod'ed guitars out.

David.

DC wrote:
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> DC
>

Subject: Re: Guitar - compensated nut
Posted by Dubya Mark Wilson on Wed, 16 Aug 2006 04:07:06 GMT
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You'll *never* totally solve that using our 12 tone tempered scale....
anywhere on the neck where there is mathematically "correct" intonation of
the instrument. On such an intonated instrument our happy sounding major
3rd interval is technically correct but musically flawed. The intonated 3rd
always sounds a little sharp (or wide to be scientific about it) and there
is typically some 'beating' going on in that interval. This is where
orchestral string players have an advantage us fretted players. They play
the interval so that it is musically pleasing. The difference is around 15
cents or, said another way, the natural pure sounding major 3 interval is
about 14% narrower than a "perfect" 3rd.... thus your interval between G and
B when each is "correctly" tuned sounds bad. To be factual, that meaty
sounding 1/5 power chord is also screwed... our ears just don't sweat that
one as much.

There is a lot I could write on this as I have studied it quite a bit for
the same reason DC wants to cut is way into solving the unsolvable at the
narrow end of the fingerboard. Won't happen Don but Buzzy Featon managed to
cheat it a little bit with cuts and tuning procedure that starts with the D
string. I think what I'll do here is google for some good info on these two
related topics and paste some links. Look for another post.

WMW

"Aaron Allen" <nospam@not_here.dude> wrote in message
news:44e264cd$1@linux...
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> AA

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>> DC
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Subject: Re: Guitar - compensated nut
Posted by Dubya Mark Wilson on Wed, 16 Aug 2006 04:16:04 GMT
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As promised....

http://www.buzzfeiten.com/howitworks/tuningwtbfts.htm
More to be found within the site... be sure to nose around

http://answers.google.com/answers/threadview?id=16918
Ignore the opening paragraph... the meat is further down the thread.

WMW

"Dubya Mark Wilson" <mark.xspam@avidrecording.com> wrote in message
news:44e29884$1@linux...
> You'll *never* totally solve that using our 12 tone tempered scale....
> anywhere on the neck where there is mathematically "correct" intonation of
> the instrument. On such an intonated instrument our happy sounding major
> 3rd interval is technically correct but musically flawed. The intonated
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Subject: Re: Guitar - compensated nut arrgghh!!
Posted by DC on Wed, 16 Aug 2006 05:10:25 GMT
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Oh no mateys, It's the dreaded temperment discussion!!!

Well, W. Mark is right of course, but it is a different subject
than the one I raised. All I want to do is get the guitar to
actually match our (imperfect) equal temperment scale.

It does not do so without some work on intonation at both
ends of the string.

Just intonation (the cure for sour thirds) is simply not practical
for most of us since it works in one key only and the entire
band must use it.

We are stuck with equal temperment and some sweetened
versions of it from Buzz, and Petersen has a nice guitar temper-
ment too, but it is not just intonation, as the Feiten system is
not.

Again, I just want the guitar to be in tune with equal
temperment. I came darn close.

More tomorrow. BTW, although it is not as perfect as just
intonation (which btw, I have heard and I find it a bit dull

sounding) the guitar when it actually matches our standard
tuning system sounds WAY better than when it does not.

DC

"Dubya Mark Wilson" <mark.xspam@avidrecording.com> wrote:
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Subject: Re: Guitar - compensated nut arrgghh!!
Posted by Aaron Allen on Wed, 16 Aug 2006 05:49:29 GMT

Mainly, I don't want to feel like a 3rd thumb when I work with a keyboard player or sequence. That used to make me NUTS, completely NUTS listening to that night after night and trying to compensate through manual string bending and such.

AA

"DC" <dc@spammeryonthehighsea.com> wrote in message news:44e2a8c1$1@linux...
>
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>>>> DC
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Subject: Re: Guitar - compensated nut arrgghh!!
Posted by Neil on Wed, 16 Aug 2006 12:02:04 GMT
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Guys, try this, this works for me, and without compensated
nuts - although in one way or another I've been compensating
for my nuts since I was a teenager (cue rim shot) :D

If you want a quick & easy method that works great for playing
along with keyboards, first tune to a strobe or quartz tuner,
etc. then check this chord formation on the fifth &
seventh frets. It's a suspended variant & it's a barre across
the fifth fret followed by the placement of your third finger
on the 7th fret of the D string & your pinky on the 7th fret of
the G... play all 6 strings of this chord & if it sounds good

you're there! Check the same chord up two frets & if your
guitar's set up properly it'll sound good there, as well. If
you hear beating, then adjust the top three strings as needed,
but don't overdo it because then standard 1st-position
voicings might sound "off". Do this & you'll be right on
for nearly any keyboard except honky-tonk pie-an-uhh's

Neil

"Aaron Allen" <nospam@not_here.dude> wrote:
>Mainly, I don't want to feel like a 3rd thumb when I work with a keyboard

>player or sequence. That used to make me NUTS, completely NUTS listening
to
>that night after night and trying to compensate through manual string
>bending and such.
>
>AA
>
>
>"DC" <dc@spammeryonthehighsea.com> wrote in message news:44e2a8c1$1@linux...
>>
>> Oh no mateys, It's the dreaded temperment discussion!!!
>>
>> Well, W. Mark is right of course, but it is a different subject
>> than the one I raised. All I want to do is get the guitar to
>> actually match our (imperfect) equal temperment scale.
>>
>> It does not do so without some work on intonation at both
>> ends of the string.
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>> Just intonation (the cure for sour thirds) is simply not practical
>> for most of us since it works in one key only and the entire
>> band must use it.
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>> We are stuck with equal temperment and some sweetened
>> versions of it from Buzz, and Petersen has a nice guitar temper-
>> ment too, but it is not just intonation, as the Feiten system is
>> not.
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>> Again, I just want the guitar to be in tune with equal
>> temperment. I came darn close.
>>
>> More tomorrow. BTW, although it is not as perfect as just
>> intonation (which btw, I have heard and I find it a bit dull
>> sounding) the guitar when it actually matches our standard

>> tuning system sounds WAY better than when it does not.
>>
>>
>>
>> DC
>>
>>
>> "Dubya Mark Wilson" <mark.xspam@avidrecording.com> wrote:
>>>You'll *never* totally solve that using our 12 tone tempered scale....
>>>anywhere on the neck where there is mathematically "correct" intonation
>> of
>>>the instrument. On such an intonated instrument our happy sounding major
>>
>>>3rd interval is technically correct but musically flawed. The intonated
>> 3rd
>>>always sounds a little sharp (or wide to be scientific about it) and there
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>>>is typically some 'beating' going on in that interval. This is where
>>>orchestral string players have an advantage us fretted players. They
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>>>the interval so that it is musically pleasing. The difference is around
>> 15
>>>cents or, said another way, the natural pure sounding major 3 interval
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>>>about 14% narrower than a "perfect" 3rd.... thus your interval between
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>>>B when each is "correctly" tuned sounds bad. To be factual, that meaty
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>>>There is a lot I could write on this as I have studied it quite a bit
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>>>the same reason DC wants to cut is way into solving the unsolvable at
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>>>"Aaron Allen" <nospam@not_here.dude> wrote in message
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>>>> Very interested.. I custom slotted and filed a nut on my LP trying to
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>>>> this issue to go away on the B string... it helped, but not a complete
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>>>>> For the last 2 days I have been working on an idea for a intonated
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>>>>> It works. The guitar is more in tune, by far, than ever before.
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>>>>> DC
>>>>>
>>>>

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>>
>
>

Subject: Re: Guitar - compensated nut arrgghh!!
Posted by Brian Porick on Wed, 16 Aug 2006 13:47:52 GMT
View Forum Message <> Reply to Message

Don,

Be sure to post this on your guitar blog as well. My boss is a guitar geek
and checks out your blog, and I'm sure he'd be interested in this.

Brian

"DC" <dc@spammeryonthehighsea.com> wrote in message news:44e2a8c1$1@linux...
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Subject: Re: Guitar - compensated nut
Posted by TCB on Wed, 16 Aug 2006 14:59:58 GMT
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But IIRC the closeness of the fret to the nut is also part of the problem. That is, the pressure on the string to fret the note is greater on the first fret than then 12th, and that adds additional tuning problems.

Not that this isn't a good idea, just that I think guitars are, by nature, creatures that play out of tune. Ben Verdery, the uber classical guitar genius I've met around Yale, told me once that he just retunes between songs according to what notes are fretted and open in the particular piece coming up. I've taken that advice and usually retune the G and B strings according to the key/chords of the next song. A little ghetto but it works.

All of which become pointless since the other guitar player in the band I play in is the only person on earth who can bash a TELECASTER out of tune before the first chorus, but I still try.

TCB

"DC" <dc@spammersinchulavista.org> wrote:
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>DC
>

Subject: Re: Guitar - compensated nut (temperment)
Posted by tonehouse on Wed, 16 Aug 2006 18:09:33 GMT
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Hi folks...I have studied the "temperment ratio" with instruments for many years.It is a mathematical problem,first related to us by Pythagoras..As a piano tuner,I hear the effects of temperment most every day..this same type of thing applies to the scale design of pianos,and any stringed instrument..The correct answer is that it will always come out an "odd number" just like "Pi",you can divide infinitely,and there will be no "even" relationship. There used to be a company called"Microfret",back in the 1960's, who made electric guitars that sort of looked like "Mosrite" solid bodies. Those guitars had a fully adjustable nut and bridge,similar to a Fender Strat type of bridge,but at both ends..With the aid of my Strobetuner,I tried many different "compensations" trying to get a balance of intonation,between the open and fretted strings....then you run into the actual fret scale placement as your "variable"...Were the frets installed exactly perfect for that neck length in the first place? How do you determine this? Back to Pythagoras..it's roughly a 3:to 1 ratio...again,an "odd" number....As another writer stated,you may seem to improve the first half of the scale ,up to the 6th fret by this type of nut compensation,but then you have the same problem with the upper scale...Then you have inventors of "fan frets" that address the differences in the string gauges,by having the frret width vary horozontally....Anyway,good luck with your experiments,and let us know what you find out.....
"DC" <dc@spammersinchulavista.org> wrote in message news:44e25d2a$1@linux...
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Subject: Re: Guitar - compensated nut
Posted by Mark McDermott on Wed, 16 Aug 2006 18:44:40 GMT
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Check out the new Steve Morse signature guitar that's reviewed in this month's
Guitar Player magazine.

"DC" <dc@spammersinchulavista.org> wrote:
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>
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>
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>

Subject: Re: Guitar - compensated nut
Posted by DC on Wed, 16 Aug 2006 18:52:01 GMT
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Ok, here's the short version. (It's my wife's birthday and we are getting out of town)

I will do a longer version, with pics, later.

I started thinking about all this a year or so ago when I got my Petersen Virtual Strobe tuner. On the chromatic setting you can check the intonation very easily at the nut by perfectly tuning the open string and the pressing down the string at the first fret.

Ouch, my guitars averaged 4 out of 6 strings out of tune.

(btw, let me add, that you cannot fix this problem with adjusting your tuning. You can make it a bit better, in certain keys, but you can't fix it. oh, also, if the height of the string slot is right, the pressing down of the string is not significant here in terms of tuning accuracy. a fact I doubted, until I checked it)

Then my guitar builder friend told me about this guy.

http://www.mimf.com/nutcomp/

Check out the pics if you don't want to read the whole thing.

BTW, none of the fixed staggered nuts like the Earvana are likely to truly work well unless you use the exact same guitar, and strings that they used. Fixed, staggered nuts suffer from the same design flaw as fixed bridges at the other end of the guitar - one size fits all.

Well it doesn't. Not if you want it right.

Anyway, I first did a version of Delft's nut a year ago on one of the guitars using pick material of different thicknesses as shim stock and attaching them with super glue. Worked great. The guitar played more in tune than any guitar I have played. (I do use the Petersen sweetened tuning BTW, but do NOT use it or any other when setting up the nut staggers. Standard equal temperment only and you need a good chromatic tuner)

Because that guitar plays better than all the others, (and it has worn out frets!) I decided to do this with my favorite 87 Anderson strat that has new stainless steel frets (which I LOVE) on it.

I didn't want to do the whole glue-on leetle pieces of pick routine, and it looks goofy anyway, so here's what I did:

(this only works on strats. I have not tried it on anything else yet)

--PLEASE don't try this if you care about your guitar's resale value--

Also, this requires significant luthery skills (woodworking etc) if
you are not sure you can do this, you can ruin your neck!

You get a Gibson nut blank form StewMac.

http://www.stewmac.com/shop/Nuts,_saddles/String_nuts/Graph_ Tech_Nuts.html

#1868

It is 3/16 wide as opposed to the 1/8 of strats. You inlet the fingerboard
in the direction of the body only, to make the nut slot
wider for the new nut.

All of the extra width must be in the direction of the
body! (Please, if you can't do a beautiful job of inletting the
fingerboard, take it to a repair guy who can!)

In a few words, you file the new, wider nut back towards the
headstock to match the needs of each string. (using the tuner)

Use new strings of the kind you always
use, since this will not be right when you change brands / gauges.

You end up with a staggered nut that perfectly matches your
guitar, frets and strings.

Oh yes, you will hear the difference.

I have left out lots of important details, and you need some
really nice tools to do this, so don't go grabbing the files
just yet.

Did I mention that it is a LOT of work to do this right? Well it is.
I have a lot of guitar tools, and I bought 120.00 more from various
sources, and it still took me almost 2 days...

I intend to show Dan at Top Gear how I did this, and if he likes the
idea he may offer it as a service. Expect it to cost a few bucks.

More to follow.

DC

Subject: Re: Guitar - compensated nut
Posted by tonehouse on Wed, 16 Aug 2006 20:02:35 GMT
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As I was saying before,all of this stuff has been tried since the
1960's,including having seperate nut saddles for each string,and seperate
bridge saddles for each string..total freedom of compensation....but it
didn't catch on...You can certainly make it sound "better",but not equal
temperment,and chromatically .What you are doing is what harpsichord tuners
did 300 years ago..use a non- equal temperment. Some people love that
sound,as did Bach,until his compositions demanded the equal temperment...
Any system such as Buzz Feitan ,still is not truly equal temperment,but can
sound better on some guitars,and in some keys.....
"DC" <dc@spammersinnyc.com> wrote in message news:44e36951$1@linux...
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Subject: Re: Guitar - compensated nut
Posted by Aaron Allen on Thu, 17 Aug 2006 01:08:05 GMT
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This is similar to what I did to the LP in that I shaved/filed the neck back towards the body, at a bit of a slant with the smaller strings being closer to the body. It definitely made a difference, so I'm right there with you bro. I keep my action REAL low, so pressing the first fret may effect other guitarists differently but I seriously thought it to be a design flaw in the gtr itself and now I'm quite curious about measuring my other axes. Unfortunately, the amount of work (if it's even possible) to my locking nut guitars makes this about a no way project for me, but I may pick up on the LP again. Cool that I'm not losing my mind/alone in my conclusions about this, mucho 'G for the validation DC.

AA

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> DC

Subject: Re: Guitar - compensated nut
Posted by excelav on Thu, 17 Aug 2006 03:37:02 GMT
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I thought I would mention that a buddy of mine makes hand made custom guitar necks. He is crazy about exotic woods. He recently came across Brazilian rose wood veneer. I guess it has orange, black and yellow stripes in it. He is going to do head stocks with it. He was doing some EVH style necks and Fender jumped all over him. He does good work, and he can build you what ever you want.

He is on ebay, but you can check out his web site pictures of his work, look

at each page.

jcsmusicalinstruments.com/

http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=33001
8340171&ssPageName=MERC_VIC_ReBay_Pr2_PcY_BIN_IT&ref
item=330003738202&itemcount=2&refwidgetloc=closed_vi
ew_item&usedrule1=CategoryProximity&refwidgettype=cr oss_promot_widget

http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&ih=014&amp
;item=330003738202&rd=1&sspagename=STRK%3AMEWA%3AIT& amp;rd=1

James

"DC" <dc@spammersinnyc.com> wrote:
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Subject: Re: Guitar - compensated nut
Posted by DC on Thu, 17 Aug 2006 06:42:52 GMT
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Actually, what I am doing is simply matching the nut to equal
temperment, just as is done at the other end of the string with
the bridge. No non-equal temperment is involved, and it sounds
better on all strings and in all keys, just as a properly setup bridge does.

DC

"tonehouse" <zmcleod@comcast.net> wrote:
>As I was saying before,all of this stuff has been tried since the
>1960's,including having seperate nut saddles for each string,and seperate
>bridge saddles for each string..total freedom of compensation....but it
>didn't catch on...You can certainly make it sound "better",but not equal
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>"DC" <dc@spammersinnyc.com> wrote in message news:44e36951$1@linux...
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Subject: Re: Guitar - compensated nut
Posted by D-unit on Thu, 17 Aug 2006 15:48:31 GMT
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"DC" <dc@spammersinchulavista.org> wrote in message
<SNIP>

http://www.novaxguitars.com/

DB

Subject: Re: Guitar - compensated nut
Posted by tonehouse on Thu, 17 Aug 2006 17:49:11 GMT
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Thanks for sending this example guitar with the "fan frets" for horizontal compensation... "perfect " vertical compensation is mathematically impossible without adding the horizontal factor....This is the "next phase" in "equal temperament". Also the actual string makes a huge difference in pitch accuracy.. (that's why premium piano strings are individually hand wound) Some of the people who posted,do not understand the difference in the science of temperament,and scale design...The only thing this "Nova" doesn't have is separate adjustments for each string at the nut...Les Pauls and Strats are based on a standard fret spacing calculation,that is subject to manufacturing flaws..Also,knowing that pitch is totally subjective,what sounds "better" to one persons ear,may not sound better to another's. That's where tuning devices can be helpful to measure. I use a device called a "Reyburn Cybertuner" that is accurate to .001 of a cent..(most battery devices are + or - 1 whole cent ! ...and most musicians cannot even hear that difference.....)
"D-unit" <c0f@intrex.net> wrote in message news:44e48e66@linux...
>
> "DC" <dc@spammersinchulavista.org> wrote in message
> <SNIP>
>
>
> http://www.novaxguitars.com/
>
>
> DB
>
>
>

Subject: Re: Guitar - compensated nut
Posted by DC on Thu, 17 Aug 2006 18:00:17 GMT
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I have known Ralph Novax for years. Nice guy, great guitars.

It has nothing to do with compensated nuts. A Novax guitar can
still have the exact same problem if the nut is not setup to match
the needs of the strings the player uses and their particular instrument.

DC

"D-unit" <c0f@intrex.net> wrote:
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Subject: Re: Guitar - compensated nut
Posted by tonehouse on Thu, 17 Aug 2006 22:25:45 GMT
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I beg to differ with you, it is part of the same quest as trying to change
the individual string lengths,at the termination ends...How to get a fretted
instrument to maintain the same mathematical ratio,as it goes up the
fretboard..also how to get the octave harmonic at the 12th fret to be
exact....Novax has solved another side of the same problem.It is a different
sound to play the fanned frets....It takes some getting used to...He could
put a "compensated" nut on those guitars....He must have tried it,and found
it didn't really help . As long as you get the 12th fret at the exact 1/2
way point of the scale,you're in good shape...as long as the fret distances
are measured and cut correctly.And you are correct that the quality of the
string, and string gauges matter quite a bit...lot's and lot's of
variables...there are many more.
"DC" <dc@spammersinnigeria.org> wrote in message news:44e4aeb1$1@linux...
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Subject: Re: Guitar - compensated nut
Posted by Neil on Fri, 18 Aug 2006 01:29:44 GMT
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To Tonehouse: Most skilled piano tuners use "stretch tuning", not equal temperament, in the first place. Not many instruments (except for things such as trombone, and fretless stringed instruments) are even able to be played in perfect temperament in the fitst place, so if a piano tuner were to use equal-tempered tuning, the instrument would sound "off" - IOW, not what we're used to hearing.

To Don: If you were adressing my post about adjusting your tuning, or using tempered tuning dependent on the key of the song, you're right, it's still not going to be "perfect", but you said it yourself, it's going to be "better", and better as opposed to not better is still better in my book! :)

If you somehow manage to get your guitar in perfect tune with itself & to have perfect equal temperament, it's STILL going to sound "off" with most modern keyboards/synths, because most of the good ones use stretch tuning anyway nowadays (mainly applied on sampled pianos & such). In fact, some of them can even allow you to adjust just how much "strech" you have (like my Fantom, for example).

Neil

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Subject: Re: Guitar - compensated nut
Posted by DC on Fri, 18 Aug 2006 02:45:12 GMT
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"Neil" <OIUOIU@OIU.com> wrote:

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>itself & to have perfect equal temperament, it's STILL going to
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>the good ones use stretch tuning anyway nowadays (mainly
>applied on sampled pianos & such). In fact, some of them can
>even allow you to adjust just how much "strech" you have (like
>my Fantom, for example).

Of course. They are just 2 seperate subjects, temperment
& intonation. I wanted to raise one without the other, but someone
always raises temperment when you raise intonation, so I tried to
seperate the two issues again.

In truth, almost no guitarists care about temperment, and most
care very much about intonation. The reason for this is that the
guitar is flawed in its design in offering intonation compensation
at the bridge (well some guitars do at least) but not at the nut.

Just checking the open pitch vs. the pitch at the first fret will
confirm this, and fixing it has a dramatic effect on the guitars
intonation.

Intonation is defined here as how well the guitar matches its
intended temperment at all pitches.

The whole issue of how out of tune equal temperment is, is for another discussion. Frankly, like it or not, it's mostly an academic discussion.

I'd like to see if stretch tuning on kb's corresponds at all to the Feiten system or the Petersen sweetened guitar tuning.

best,

DC

Subject: Re: Guitar - compensated nut
Posted by DC on Fri, 18 Aug 2006 02:59:45 GMT
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"tonehouse" <zmcleod@comcast.net> wrote:
>I beg to differ with you, it is part of the same quest as trying to change
>the individual string lengths,at the termination ends...

Over the entire instrument, not between the nut and the first fret.

Ralph told me that his guitars are designed to sound full and warm on lead and twangy and clear on the low strings. A strat and a Les Paul on one guitar. The issue of nut compensation cannot be addressed by scale length, or even multiple scale lengths on one instrument. it can only be addressed by a compensated nut.

>How to get a fretted
>instrument to maintain the same mathematical ratio,as it goes up the
>fretboard..also how to get the octave harmonic at the 12th fret to be
>exact....

And once you fret a note, the issue of nut intonation no longer exists. Compensated guitar nuts is purely an approach to deal with the pitch accuracy between open and fretted notes.

>Novax has solved another side of the same problem.It is a different
>sound to play the fanned frets....It takes some getting used to...He could
>put a "compensated" nut on those guitars....He must have tried it,and found
>it didn't really help .

Why don't you ask him? I can assure you that it does help, and in significant ways. BTW, I got comfortable with the fanned frets

in about 5 minutes. Lovely guitars really.

>As long as you get the 12th fret at the exact 1/2
>way point of the scale,you're in good shape...as long as the fret distances
>are measured and cut correctly.

This simply is not the case.
Without compensating the nut, the open string and the fretted strings will not match. This is why open E chords and open D chords do not usually both sound good on guitars. We adjust for it by avoiding the strings that don't work in the other chord, but that is not fixing it.

DC

Subject: Re: Guitar - compensated nut
Posted by Neil on Fri, 18 Aug 2006 03:03:44 GMT
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"DC" <dc@tunersinhell.com> wrote:
>I'd like to see if stretch tuning on kb's corresponds at all to the
>Feiten system or the Petersen sweetened guitar tuning.

It doesn't.. it doesn't correspond at ALL, and that's the whole point of it, in fact... stretch tuning PURPOSELY throws stuff out of perfect intonation. There's something about it that sounds more pleasing to our ears, and in that regard one could probably liken it to the whole tube/x-former/analog tape thing... certain types of distortion, while "imperfect", sound more pleasing to our ears.

You know what stretch tuning is right? I mean, you know what I'm referring to when I say that, yes? If you're not sure, google it or let me know & I'll elaborate - it's the polar opposite of what Buzzy & fan-fretting are trying to accomplish, yet it's been the standard for skilled piano tuners forever.

Neil

Subject: Re: Guitar - compensated nut
Posted by dc[3] on Fri, 18 Aug 2006 03:12:10 GMT
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"Neil" <OIUOIU@OIU.com> wrote:

>You know what stretch tuning is right? I mean, you know what
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>yet it's been the standard for skilled piano tuners forever.

Yes, I know what stretch tuning is. Fanned frets are not stretch tuning, nor are they intonation compensating, they are simply different scale lengths on one guitar. The guitars tune using standard tuners.

My piece was simply about nut compensation, because it makes a real difference in how well guitars play in tune on both open and fretted strings.

DC

Subject: Re: Guitar - compensated nut
Posted by Neil on Fri, 18 Aug 2006 03:22:22 GMT
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"DC" <dc@spammersinhell.com> wrote:
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>"Neil" <OIUOIU@OIU.com> wrote:
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>different scale lengths on one guitar. The guitars tune using
>standard tuners.
>
>My piece was simply about nut compensation, because it makes
>a real difference in how well guitars play in tune on both open and
>fretted strings.

No, i know that, but i was addresing your question with regard to the other thing you asked.

In any event, scale length makes a difference.... for example, I don't own a PRS, but I've played them, and they seem to be better "in tune" overall with their barely-variable bridge intonation setup than either Gibbys' or Fenders, and we're

talking about a PRS' 25" scale length vs. Gibsons' 24 3/4"
and Fender's 25 1/2", so maybe there IS a "magic" scale length
somewhere in there? (25 & 1/16's"???)

Neil

Subject: Re: Guitar - compensated nut
Posted by DC on Fri, 18 Aug 2006 05:00:53 GMT
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"Neil" <OIUOIU@OIU.com> wrote:

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>somewhere in there? (25 & 1/16's"???)
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>Neil

I'll bet he is more precise with the location of the nut and bridge.

What was really interesting to me was that almost all of the
strings on the strat needed the nut to be brought towards
the body more. Only the high E wanted to be brought back to
almost the stock position. Oh, and this is a Tom Anderson
guitar (pre-Feiten). I suspect PRS is putting the nut and bridge
closer to the position we end up with after futzing with them.

It would be interesting to ask them. Hey, that's what the
NAMM show is for right?

DC

Subject: Re: Guitar - compensated nut (Physics)
Posted by tonehouse on Fri, 18 Aug 2006 16:09:51 GMT
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Hi again..You could possibly be correct in a small way,on a electric
solid-body guitar...but not in a "universal" and scientific way.You are
totally wrong about the "open vs fretted" scale...they are totally
related...You are not taking in to account many variables,including
"partials",neck relief,fret height,finger pressure.As I said before your

"experiment" with nuts has been done,WAY back in the early 1960's.by using a fully adjustable nut (imagine your Tune-O-matic bridge on the nut and saddle). This did NOT catch on to any builders(except Microfret,which went out of business) Why didn't Fender or Gibson,or Martin pursue this type of adjustment??..It is a trade-off only..You are only "splittting the difference" of the total distance of the string...It is still impossible to divide the freq numbers evenly....This is "Physics",based on Pythagorean theory..If you like,I can recommend a book for you to study about the subject. Understanding the scale of a 6-string guitar is elementary,compared to the 200 plus strings on a grand piano scale design...There are literally hundreds of scale designs for pianos..NONE of them are perfect....
"DC" <dc@spammersinoregon.com> wrote in message news:44e52d21$1@linux...
>
> "tonehouse" <zmcleod@comcast.net> wrote:
> >I beg to differ with you, it is part of the same quest as trying to change
> >the individual string lengths,at the termination ends...
>
>
> Over the entire instrument, not between the nut and the first fret.
>
> Ralph told me that his guitars are designed to sound full and warm
> on lead and twangy and clear on the low strings. A strat and a Les
> Paul on one guitar. The issue of nut compensation cannot be
> addressed by scale length, or even multiple scale lengths on one
> instrument. it can only be addressed by a compensated nut.
>
>
> >How to get a fretted
> >instrument to maintain the same mathematical ratio,as it goes up the
> >fretboard..also how to get the octave harmonic at the 12th fret to be
> >exact....
>
> And once you fret a note, the issue of nut intonation no longer
> exists. Compensated guitar nuts is purely an approach to deal with
> the pitch accuracy between open and fretted notes.
>
>
> >Novax has solved another side of the same problem.It is a different
> >sound to play the fanned frets....It takes some getting used to...He could
> >put a "compensated" nut on those guitars....He must have tried it,and found
> >it didn't really help .
>
> Why don't you ask him? I can assure you that it does help, and
> in significant ways. BTW, I got comfortable with the fanned frets
> in about 5 minutes. Lovely guitars really.

>
> >As long as you get the 12th fret at the exact 1/2
> >way point of the scale,you're in good shape...as long as the fret
distances
> >are measured and cut correctly.
>
> This simply is not the case.
> Without compensating the nut, the open string and the fretted
> strings will not match. This is why open E chords and open D
> chords do not usually both sound good on guitars. We adjust for it
> by avoiding the strings that don't work in the other chord, but that
> is not fixing it.
>
> DC
>

Subject: Re: Guitar - compensated nut (Physics)
Posted by DC on Fri, 18 Aug 2006 16:40:47 GMT
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"tonehouse" <zmcleod@comcast.net> wrote:
>Hi again..You could possibly be correct in a small way,on a electric
>solid-body guitar...but not in a "universal" and scientific way.

You're just not getting it. Try this. Take a good tuner, say a Petersen. Now take a variety of guitars, use any scale length or multiple scale lengths that you wish.

Compare the perfectly tuned open string to the pitch at the first fret. Use consistent pressure. Over a sampling of several guitars, you will find pitch problems unless the nut is compensated.

These pitch problems make significant problems when the chord you play has different open strings than another chord. If one chord is in tune, another is not. Compensating the nut to match the needs of the individual guitars solves the problem.

I can show you the difference on a Petersen tuner, and it certainly is audible.

>You are
>totally wrong about the "open vs fretted" scale...they are totally
>related...

What I did was simply correct the inaccuracy of the nut one

one particular guitar. Get it?

>You are not taking in to account many variables,including
>"partials",neck relief,fret height,finger pressure.

Don't need to. I can correct the
built-in inaccuracy of the stock nut however. You need to have
a well setup guitar before you do any of this. Pressure is up to the
player, but good players are pretty consistent and that has no
more to do with a compensated nut than it has to do with a
compensated bridge.

>As I said before your
>"experiment" with nuts has been done,WAY back in the early 1960's.by using
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>fully adjustable nut (imagine your Tune-O-matic bridge on the nut and
>saddle). This did NOT catch on to any builders(except Microfret,which went
>out of business) Why didn't Fender or Gibson,or Martin pursue this type
of
>adjustment??

Because they sell so many guitars without caring about it?
Because to do this right requires individual attention to the
uniqueness of each guitar?
Because they do not know what strings you are
going to use? Because it would add 50 bucks or so to the cost of
each guitar to spend the time to get it right? Because a lot of
players don't care and don't want to spend the money?

Some of us do care.

...It is a trade-off only..You are only "splittting the
>difference" of the total distance of the string...It is still impossible
to
>divide the freq numbers evenly....This is "Physics",based on Pythagorean
>theory..If you like,I can recommend a book for you to study about the
>subject.

Nonsense. I simply did the same thing at the nut that we do
at the bridge. You apprently don't understand this yet. Instead
of recommending books, why don't you try it yourself?

>Understanding the scale of a 6-string guitar is elementary,compared
>to the 200 plus strings on a grand piano scale design...There are literally
>hundreds of scale designs for pianos..NONE of them are perfect....

Perfection is a non-issue. Improvement is a real issue indeed considering how many guitars have this problem.

Go check this out for yourself before you tell me I am wrong any more ok?

thanks

DC

Subject: Re: Guitar - compensated nut (Physics)
Posted by tonehouse on Fri, 18 Aug 2006 17:54:32 GMT
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Hi there...I have studied this type of thing for 40 years..I have set up dozens of guitars,and tuned thousands of pianos..I have a major in physics...I have a "solid state" Peterson tuner that is 30 years old...before that,I had a "Tube" strobe by Conn(1970)..I also have new Peterson small model..but they are only accurate to .01. I use a Reyburn Cybertuner these days ..accurate to .001 of a cent. I did your "experiment" with Strats and Les Pauls 35 years ago..It is only "splitting the difference" You can have only one "string length" whether it's a straight or compensated terminal end..Either a scale is "perfect" or "equal temperament" or it is "non-perfect" compensated,as most fretted instruments are(unless you are talking about fretless guitars,in which case a compensated bridge or nut would be useless) Pianos attempt to have "equal temperament"..they have no frets,but they do have even and odd "Partials" .These vary according to string length..That's why a 9-foot Steinway D sounds much better than a 4 foot upright,at the same exact pitch...The only note on a well-tuned piano that is "perfect" is the A-440,the rest of the notes are "tempered" to that A..an octave above the A 440 is NOT 880 !!....The fret placement on guitars is governed by the "nodes" on the string length..If you had a guitar neck 6 feet long,the sound would be beautiful,full of even order partials..but the fret spacing would be huge..and the need for compensation would diminish greatly...Lloyd Loar lenghtened the scales,and compensated the bridges on all Gibson products in the 1920's ,making a huge difference it the sound . My 1918 pre-Loar mandolin in very "off" in it's scale design..very short neck..but it still sounds great,and must be adjusted sometimes for different keys...BUT you CANNOT adjust for the first fret without adjusting for the whole string length...period...I NEVER said you were wrong,I just said you are only covering a small part of the picture...
"DC" <dc@spammersinhell.org> wrote in message news:44e5ed8f$1@linux...
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> "tonehouse" <zmcleod@comcast.net> wrote:
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> thanks
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> DC
>

Subject: Re: Guitar - compensated nut (Physics)
Posted by dc[3] on Fri, 18 Aug 2006 18:28:00 GMT
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"tonehouse" <zmcleod@comcast.net> wrote:

>I NEVER said you were wrong,I just said you
>are only covering a small part of the picture...

But that's the only dang part of the picture I was talking about!

For someone with a good guitar, good frets, and new strings,
properly setup, this will still make a real difference when playing
open chords.

That's it.

I purposely stayed out of the temperment discussion and I
am still staying out of it. Someone once said "if you do everything
at once, you do everything poorly" and this little forum is not
the place for a course in temperment. It is, however, a good place
to discuss a mod that makes your guitar play better.

DC

Subject: Re: Guitar - compensated nut (Physics)
Posted by tonehouse on Fri, 18 Aug 2006 18:47:35 GMT
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I didn't realize that you were in charge of subject matter
here...sorry...But I hope you did learn at least that your "experiment" has
been tried...many times....
"DC" <dc@spammersinhell.com> wrote in message news:44e606b0$1@linux...
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> DC

Subject: Re: Guitar - compensated nut (Physics)
Posted by DC on Fri, 18 Aug 2006 18:50:35 GMT
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Just trying to stay on-topic. You. of course, are welcome to provide a course on temperment here if you like. It's certainly more relevant than theology.

I did a patent search on compensated nuts a while back, and it turns out that someone has a nut that may be mounted in the standard slot, yet has an overhang to allow for precise fitting to each instrument. He's not doing anything with the patent. Swell huh?

So, being my idea was not patentable, I decided to share it with others. If someone gets better guitar sound because of it, then I am a happy guy. I have it on 2 guitars not and it works very well indeed.

DC

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>>
>> DC
>
>

Subject: Re: Guitar - compensated nut (Physics)
Posted by Neil on Sat, 19 Aug 2006 03:43:35 GMT
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I think, FWIW, that there's no such thing as perfect intonation - other than on instruments that don't have any kind of fixed intervals (such as violins, cellos, trombones, etc, etc); and that perfect intonation CAPABILITY is subject to the operator, who - being human - is imperfect as well, and therefore incapable of hitting every note with perfect pitch every single time. So I say, you can even-temper your pianos, intonate your guitars, install new nuts, do whatever you want to get as close as possible, yes; but nothing's ever going to be perfect, so don't sweat a few cents off here & there.

And if you're THAT picky about perfect intonation, let's not even TALK about "pushing pitch" as a vocal technique. lol

Neil

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>>>
>>> DC
>>
>>
>

Subject: Re: Guitar - compensated nut (Physics)
Posted by Gary Flanigan on Sat, 19 Aug 2006 15:31:00 GMT
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"Neil" <OIUOIU@OIU.com> wrote:
>
>I think, FWIW, that there's no such thing as perfect
>intonation - other than on instruments that don't have any kind
>of fixed intervals (such as violins, cellos, trombones, etc,
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>be perfect, so don't sweat a few cents off here & there.
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>And if you're THAT picky about perfect intonation, let's not

>even TALK about "pushing pitch" as a vocal technique. lol

What is "pushing pitch"? This is the first I've heard the term.

Thanks

Subject: Re: Guitar - compensated nut (Physics)
Posted by Neil on Sat, 19 Aug 2006 16:58:35 GMT
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"Gary Flanigan" <gary_flangian@ce9.uscourts.gov> wrote:
>
>"Neil" <OIUOIU@OIU.com> wrote:
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>What is "pushing pitch"? This is the first I've heard the term.

It's where you hit a sustained note & after holding that pitch
for moment or two, "push" ever so slightly sharp shortly before
the next passage or line... it creates tension if done properly,
and while some people probably do it inadvertently, there are
also vocal instructors who teach it as a regular technique.
You hear it in ballads a lot - think Mariah, Whitney, et. al.

Neil

Subject: Re: Guitar - compensated nut (Physics)
Posted by tonehouse on Sun, 20 Aug 2006 21:27:00 GMT
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Thanks Neil that's exactly what I was trying to say.....pitch is
subjective....
"Neil" <IUOI@OIU.com> wrote in message news:44e7433b$1@linux...
>
> "Gary Flanigan" <gary_flangian@ce9.uscourts.gov> wrote:
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> Neil

Subject: Re: Guitar - compensated nut (Physics)
Posted by dc[3] on Sun, 20 Aug 2006 22:22:20 GMT
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Actually pitch is absolute and may be perfectly measured.

I think what you are getting at is that perception of pitch, or
"in-tuness" is subjective, and indeed it is. This is why many people
find just intonation flat and boring sounding.

All I've done is do for the nut what we do for the bridge, which is
to adjust it as close as we can to accurate (not perfect) and use
that as the foundation for playing, rather than something that is

so inaccurate that many people find it annoying and most guitar players have to learn to compensate for it by avoiding certain strings in certain keys.

BTW, I have lived with this setup for a couple days now and absolutely love it. One thing that has changed though, is that the Peterson sweetened tuning now does not sound very good on this guitar. Standard equal-temperment works better with the nut compensated. Interesting.

More to follow.

DC

"tonehouse" <zmcleod@comcast.net> wrote:
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