

Re: op-amps with wide open-loop bandwidth ?

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- *From:* "Kevin Aylward" <see_website@xxxxxxxxxxxxxx>
 - *Date:* Mon, 20 Mar 2006 21:12:39 GMT
-

Dave Moore wrote:

"Kevin Aylward" <see_website@xxxxxxxxxxxxxx> wrote in message
[news:s5fTf.224999\\$YJ4.60901@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:s5fTf.224999$YJ4.60901@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)

Dave Moore wrote:

a slew insults to go along with the mistaken presumptions.

I read your other replies in this thread, so I didnt make any assumptions. It appears that you believe that having an open loop BW at least equal to the audio BW is nessesary/advantages to get a good sound.

No, I don't believe that at all. I do believe however that in spite of what some so-called experts may say and in spite of (what are often flawed) studies that it **might** be a factor that bears looking into. It does seem to me to be of interest that out of all of the opamps I have on hand, the two that I like the best (THS2052 & THS2022) just happen to have open loop bandwidths in excess of 20KHz

My guess is that in AB blind tests, **you** cant tell the difference. Its that old delusion bit. One lies to oneself. You have an agenda that you want to purpetuate.

"A good scientist tries to find evidence to support his theory, a better scientist tries to find evidence to contradict his theory" – R. Fynmann.

This is very unlikely. All the open loop gain that is now thrown away at the lower frequencies, can now no

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longer be used to reduce the distortion at those frequencies. It always pays you (distortion wise) to have as much loop gain as possible over the widest frequency range.

Of course, if the amp is slewing prior to the audio BW, then...

What you're saying is right in line with my observations about the THS2052 and the THS2022. They both have the same open loop corner of about 50KHz but THS2022 is the better sounding of the two

I don't believe you.

and it does indeed have a higher open loop gain and higher gain bandwidth product.

And no, I am not making any assumptions about whether all engineers are the *real* audiophiles. I'm quite open minded.

And I usually believe that people have valid reasons based on their experiences for believing the things that they do. One scientist looking at one set of data will draw one conclusion whereas another studying the same phenomena with a different but contradictory dataset may draw a completely different conclusion. In the end perhaps a new conclusion is reached due to the controversy and everyone is happy as they were all proved to be right.

Sure, but this open loop BW thing is a no brainer. It's not rocket science. By itself, the open loop BW is not relevant. It's not debatable at all. It's all very well understood.

Let's just say that it's believed by some to be very well understood.

No. It is indeed completely understood. Period.

Very few physicists argue with the general theory of relativity, and damn less qualified EE's argue

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about the properties of correctly designed feedback amplifiers.

I suppose that depends on ones definition of a "qualified EE"
When it comes to guitar amplifiers, IMO a qualified EE would
be one that isn't tone deaf.

I'm and EE, and not tone deaf, I play guitar, and furthermore I have
actually got pro audio designs out there.

For example, some

actually have extensive professional
experience in analogue design
and pro audio, from both a technical point of
view and as a
musician. Some of these, after such
extensive study, indeed
conclude that it there is no reason to listen to
an amplifier in
order to design a straight piece of wire with
gain. Its purely a
technical issue based on gains, distortion,
bandwidth, noise etc.

The fact that I'd rather prove this to myself doesn't mean that
I don't respect the opinions of others. However there's a bit
more
to this story that might be of significance if anyone cared to
find
out first before popping off a few rounds and asking
questions
later.

The issue here, is that I have heard all this before from endless
numbers of people.

Where there's smoke there's usually fire.

Nonsense.

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Like, tea leaf reading, UFOs, astrology, thor, pixies, scientology
...yeah, get real mate. Life is full of vapourware.

People usually have an axe to grind and therefore invent all sort of
nonsense.

You have said nothing new. Its already a dead
subject. You jsut are not aware of all the prio art on this matter.

I am aware however of my own experience which means more
to me than any "prior art". There was also at one point in time
plenty of prior art on the subject of why Solid State amps
were an improvement over tube amps. As it turned out,
those that weren't tone deaf weren't fooled.

Again, complete nonsense. Sure, *some* people used to design shit SS
amps, just like some still design shit tube amps.

Look, you out of your depth. I would like to say this without it
sounding like a personal insult, but I just don't know any way to say it
differently. You just know what you talking about.

I have been designing amps for 30+ years, been playing guitar 30+ years.
I

I'm working on more than one front at once. Besides design,
I also do repair and upgrades for a select handful of
musicians.

With all due respect, what this tells me is that you are really a
hacker/tech, not a qualified EE. You dont know what you are really
dealing with.

With all due respect, you're response tells me that you are
a presumptuous arrogant snob.

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I am someone who has been there. Sorry if it comes out as arrogant, as noted, its just about impossible to tell someone that they are truly out of their depth without sounding insulting. Its trivially clear that you just don't have the technical background to understand why you are actually wrong. I wish it were different, believe me.

Sure, when I was doing my degree I used to supplement my grant (UK) by doing repairs for a music shop. However, like, I'm going to do physical work with that sort of stuff for other people 25 years on?

You don't understand that a "handful of select musicians means friends of mine? So you're in essence too full of yourself to help out your friends ? Just as I thought, an arrogant snob.

Too busy. I have a life.

However... A few weeks ago I did purchase a Marshall AVT150 combo. The bloody fools have an effects loop that is not inline. This means a volume pedal, or even a phaser won't work correctly. So, I emailed for the circuit diagram and modified the effects loop to work correctly. It even had an irritation of having the clean channel with significantly more gain then the distortion channel, making it hard to get maximum volume from the distortion channels when switching. So, sure, I fixed the gains. But this is all for me personally.

Yup, a selfish fuck that'll help himself but not a friend,

A friend in need... is a pest,.. get rid of him.

Fortunately, I don't have many friends, so I don't have much of a problem in being selfish that way.

Oh... by the way you need to understand just what selfish means...<http://www.anasoft.co.uk/replicators/altruism.html>

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In some cases an upgrade might entail something as simple as swapping out the opamps in a unit. Under these circumstances there is indeed a quite noticeable difference in the sound from one opamp to another.

Maybe for a 709 to an op-37, but in general, little chance of hearing any difference. Been there mate.

Kevin, with all due respect, yer an idiot.

Oh...?

<http://www.anasoft.co.uk/band/bio.htm>

Also, in the years that I have been doing this I have noticed (as well as the musicians themselves) very definite characteristics that always follow one particular opamp around regardless of which piece of gear it is plunked into.

Anecdotal meanderings. AB blind tests invariable show that this is all wishfull dreaming.

Better for me. As I said in another post, tis why I got the gig with the celebs

Oh...an argument by appeal to authority just dont wash mate. "Celebs" have no more value to the truth then a street sweeper.

and tone deaf arrogant snobs such as yourself are relegated to hyping their technical prowess in newsgroups

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Yeah, well no ones perfect.

As I suggested, been playing guitar and messing with electronics audio both since I was 11. I'm not deaf,

How would you know since apparently you've been tone deaf from the get go

In other words, you can see invisible men.

yet, so If there was any truth to this sort of stuff, trust me, I would have discovered it. I actually used to believe this sort of drivel until I *really* looked into it, in detail.

Which involves just what exactly? Actually experimenting or reading about some possibly flawed studies?

Building up more audio bits and peices than you have had hot dinners. Look, I got my first electronics kit at 11, the same age I started playing guitar.

For example, one of the bullshit golden ears claims is the ability to detect small static phase shifts. Yeah, so like I never built up all pass filters to test this sort of nonsense?

Flawed studies? like rigorous double blind tests on amplifiers. Yeah...I'm that daft.

Ok, so I suppose someone is going to say at this point, well of course, because the opamps are being plunked into networks designed for other opamps. Let me address this. Firstly,

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sometimes
it's not possible to get a schematic on a particular piece of gear.
Also, often there is a diminishing point of returns to attempt to trace and draw out the schematic or reverse engineer the circuits from the PCB's themselves. So, the 'plunk in' option proves to be the viable alternative

Sure, some opamps might actually oscillate at VHF in the wrong circuit.

I always check for oscillations. If the opamp is oscillating, I either compensate it properly or rule it out of the sonic signature observation list.

Oh dear...my usual quote.

"Those that use 'sonic' in their audio phrasing are usually pretentious twats, using 'sonic transparency's removes all doubt.

Look mate, what's wrong with "audio signature"?

This entailed yanking the the NE5532 on the front end and replacing it with a THS2052 and yanking the NE5532 on the tail end and replacing it with an AD828. The result, (in guitar terms) much more detail & clarity on the high notes and much improved tightness and bounce on the low notes. OK, so now the A/B test.

Quite frankly, I don't believe you.

You are obviously confusing me with someone that gives a rats ass

Then why reply to this post?

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Put the NE5532's back in. Sure 'nuff. The sound is muddy again and it's difficult to pull out the low notes whilst finger picking.

I don't believe you. I have done these sort of tests ad-infinitum.

perhaps it's time to try them again with some of the opamps I've listed and in the company of someone that isn't tone deaf.

Yeah, yeah, yeah....

So, next up, trying the unit with a number of different opamps with 'better spec's' than the NE5532's Result, all combinations produced better sound than the original 5532's as well as imparting quite predictably whatever flavor or characteristics I have observed to follow each particular opamp as they have been plunked into various units over the years.

All anecdotal meanderings. I have done the same, and it is in stark contrast to your claims. What's more, pro double blind tests on these *type* of tests *always* show no differences.

Well, the guy who happens to own this equipment has perfect pitch

Physics impossible.

and was voted by his guitar playing peers in New Orleans to be New Orleans best guitar player which is no small feat considering that New Orleans is somewhat of a Mecca for exceptional guitar players.

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Oh dear....your serious?

I've have given him on numerous occasions the option to choose his own opamps and capacitors. I never make any suggestions in advance. He invariably makes the same choices that I do. It's to the point now where he usually just says " go ahead and make the choices yourself, I trust your judgement"

As far as I'm concerned, your so-called pro double blind tests are anecdotal.

Your doing yourself a disservice.

I'll go with what I can hold tangibly in my hand thankyou very much.

So, you're wanker, whats new?

In the end I settled for the two opamps that I predicted would probably best complement the unit being that of the opamps I currently have on hand, they did just that, they best complemenbted the unit. So riddle me this. Hoiw did I know in advance that those two opamps were probably going to win the contest.

I suppose you also believe in fairies, palm reading, thor, tea cup reading, astrology?

No, I believe in the responses I get from the small handful of exceptionally gifted (non-tone deaf) professional musicians that I deal with and tangible empirical results that I can prove for myself

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Yeah...

I've also sat down with various musicians and let them decide which opamps they best like when plunked into their gear. 9 times out of ten they choose the same ones that would have chosen.

I dont belive you.

again, better for me

And this is without any pre-suggestion on my part.

So, as you can see, under these circumstances I have very legitimate reasons for wanting as large of a pool of spec-varied opamps that I can get my hands on and taking notes on just what sonic characteristics tend to follow them as they're plunked into one pice of gear after another.

I think you are simple deluding yourself. A shame really. You sound as if you could be more objective.

You say that you don't believe me and I'm speaking the truth so as far as I'm concerned, you're the one that's not being objective.

No, your deluding yourself. You don't have the background to understand just how and why you are obtaining erroneous results. Again, I wish it were different, but it aint.

So let me ask you this, would being objective entail discarding all of the tangible and empirical results that I've accrued

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Yes. The reason is that your "empirical" results disagree with credible pro test results. Your lying to yourself, yet don't realise it.

Sure to design a tube distortion circuit does require listening to it, but that's irrelevant to the design of the actual amplifier circuits.

I agree. When I design, I start with as clean of an amp as I can and dirty it up from there. And when it comes to designing a "clean amp" I truly do respect the skills of the more advanced engineers. But even here, since there is in reality no such thing as an ideal opamp, the issue becomes just how far which spec's need to go to disappear coloration.

As far as an audibly a straight piece of wire with gain, many op-amps are indeed ideal. You have probably been listening to 741s running at a closed loop gain of 100, where sure, that may well be a problem. Modern op amps are audibly perfect. That's just the way it is despite all this golden ears nonsense.

Try
THS2013
THS2062
THS2032
THS2052
THS2022
AD826
AD828
AD829
AD843
LM6172
LM318

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OPA2228
OPA2604
OPA2134
OPA275
LT1208
LT1363

running at closed loop gain of 12
and at small enough signal levels where
slewing shouldn't be a factor and also in inverting
mode where differential input errors are reduced

And this opens up another debate about how
sensitive the ear is to coloration. My conclusion is that the
coloration threshold is probably different for different
people.
Most of the more accomplished and talented musicians that
I've
worked with seem to have an extraordinary ability to hear
subtle
nuances.

They certainly claim they do, but in actual tests it all disappears.

Not in the actual tests that I have done.
And none of my musician friends have made any such claims.
They're quite humble about their abilities.
But I have noticed these abilities in them and it's probably
the reason that they've gone pro whereas the more tone-deaf
such as yourself have opted for careers in electronics.

Get bloody real mate. You just show how out of touch with reality you
are. Success in the music busines has f'all to do with musical ability.
This is trivially obvious. There are like 100,000s applicatnt for every
music "position". Clever people take life options that give them the
best chance of success, rather then bask in pathetic dreams... I can
tell you I make way, way more money in my day job as an analogue i.c.
design engineer then millions of wanna be guitarists.

How you can claim what you do above is beyond belief. I no longer have
any more time for your delusions.

{snip unread stuff}

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<http://www.anasoft.co.uk>

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"There are none more ignorant and useless, than they that seek answers
on their knees, with their eyes closed"