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From:	Max (etorus@infonie.fr)		
Date:	7/4/2002 2:33 AM		
Subject:	Freq response test?With a scope?How to?		

Hi everybody!

In order to know what makes the Sound cities 120 sound harsh i'd need to test the frequency response of the amp,i have a sweep gen (in my comp,but capable of max 5 seconds sweep!).I have a scope,an old valve tektronix storage scope.
I have cool edit pro too (but there the conections between the amp and comp will be complicated!)
I'm trying to identify what causes the [following distorsion,\(bottom wave!\)](#).Which to me,looks like the overlap of the three tone controls (active)
I've had a quick look in RDH4,but found nothing on the subject,i think in 1954,scopes weren't spread all over the place!

Best regards.

Max.

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From:	Enzo (tmenzo@msn.com)		
Date:	7/4/2002 6:42 AM		
Subject:	Re: Freq response test?With a scope?How to?		

You are applying a square wave? That's kind of a hrsh thing to do to an amp when you are looking for clean.

Serious crossover distortion too. Looks like harmonic distortion.

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From:	Max (etorus@infonie.fr)		
Date:	7/4/2002 11:09 AM		
Subject:	Re: Freq response test?With a scope?How to?		

Hi Enzo!

Harsh with my amp?

Me nooo!Well i'm aplying W^2 (square wave!),to the amp,because i wanted to see the effects of the tone controls,and discovered that type of wave (there's a litle animation,explaining what control does to the W^2 ,[there!](#)).

You say it looks like harmonic distorsion,well the harmonic content must be of a weird type,because when i play it sounds like i have sparks going on everywhere,may be like a bad transistor distorsion.The 1000hz W^2 sounds better!

Best regards.

Max.

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From: Max (etorus@infonie.fr)
Date: 7/5/2002 12:28 AM
Subject: BTT!

Sorry!



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From: kg (ride5000@ride.ri.net)
Date: 7/5/2002 6:34 PM
Subject: Re: BTT!

max,

for frequency response, use a sine wave. first use a midband freq. like 1khz. slap a dummy load on the output, strap your scope input across the dummy load. increase signal until you get to some convenient output level, say 20vpp.

now, vary the input signal FREQUENCY without touching any gain controls on the amp. first go up, towards a higher frequency. keep an eye on the output voltage as read on the scope. there will be some frequency at which the output voltage is reduced by 50%. this is your hf -3db point.

do the same thing in the other direction, with lower frequencies, and you will get the lf -3db point.

the frequencies between these two points is generally considered to be the power bandwidth of the amp.

you can use this same technique to determine the bandwidth of ANY stage or stages of the amp. it does not have to be all the way from input to output.

i used this very technique to tweak the input grid stopper on the first stage of my amp so that the -3db point was right at 20Khz. this time, instead of varying the frequency, i set it right at 20k, then used a potentiometer temporarily rigged up as the grid stopper to vary the series resistance until i got the response i wanted.

ken

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From: Max (etorus@infonie.fr)
Date: 7/5/2002 7:29 PM
Subject: Thanks a lot Ken!

You're a good man,you are!

Btw,i've progressed a touch since i've gotten the RDH4,i understand filters a bit better!

Best regards.

Max.

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From: StevieP
Date: 7/5/2002 7:39 PM
Subject: Re: BTT!

Ken:

I don't think this is quite correct.

The -3dB point is when the output voltage is down to .707 x the reference level, not 50%.

At this -3dB point, the POWER is down 50%.

Additionally, you would want to make this measurement at the maximum output level to determine Power Bandwidth, not an arbitrary level.

This results in an iterative process. The max at one frequency may not be the max at another.

We often see the results of this process in spec statements like "frequency response is 20hz-20Khz at full output power (whatever that is stated to be) +/- (n)dB.

BTW, if you ran this measurement at max output to -50%, as you say, you have a nicely overdesigned amp!

Steve

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From: kg (ride5000@ride.ri.net)
Date: 7/5/2002 8:01 PM
Subject: Re: BTT!

stevie,

you're right... -3dB point is for 70% of midband amplitude. when you get to 50% down, you're looking at -6dB, not -3 as i said. these dB figures are assuming voltage measurements. indeed, if the voltage is down 70%, then power will be halved.

you're also right to call me on my choice of words... the power bandwidth measurement should be made using a frequency sweep with the amplifier producing FULL power. often the max power is dictated at midband (1khz) and for 5% THD (just when a sine wave starts to flatten). once this power level is determined, you can then do a sweep to determine the full power bandwidth.

for a plain frequency response measurement you can pick any power you want, as long as you note what it is.

i was in a hurry replying to max, and i made a few mistakes. thanks for clarifying. i'm sure good old max will forgive me! 😊

ken
