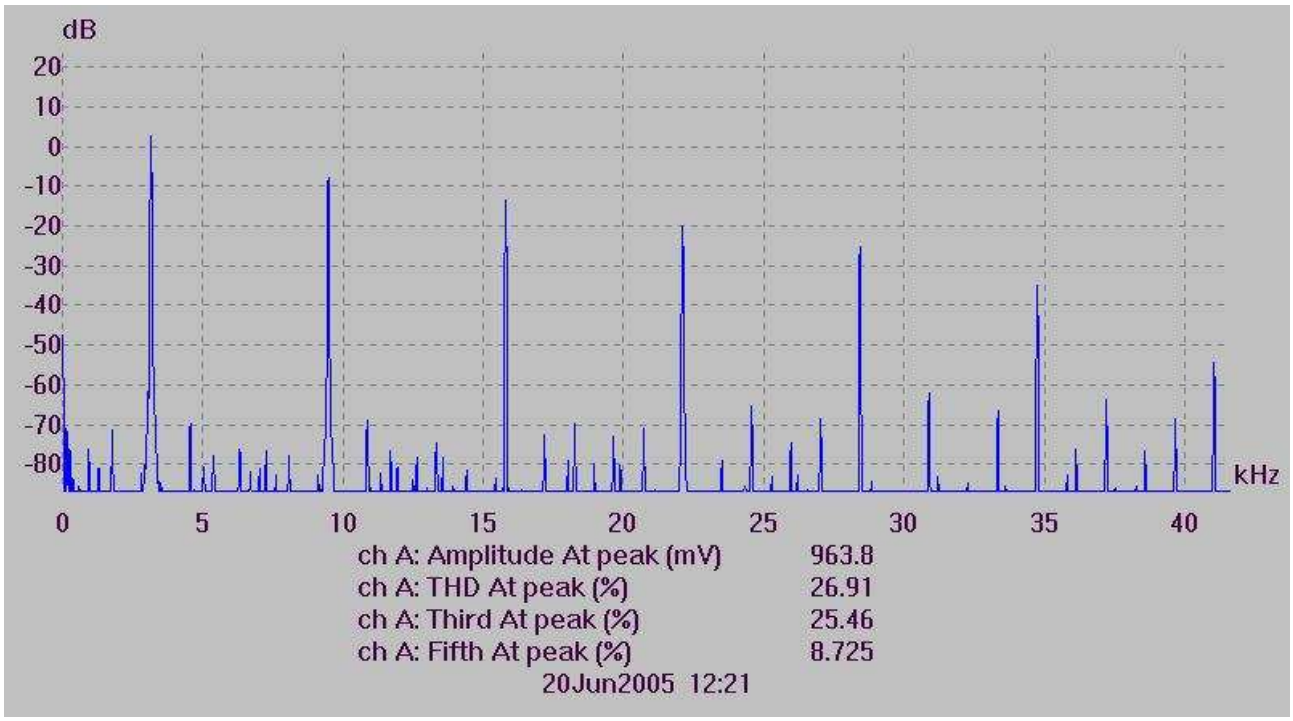
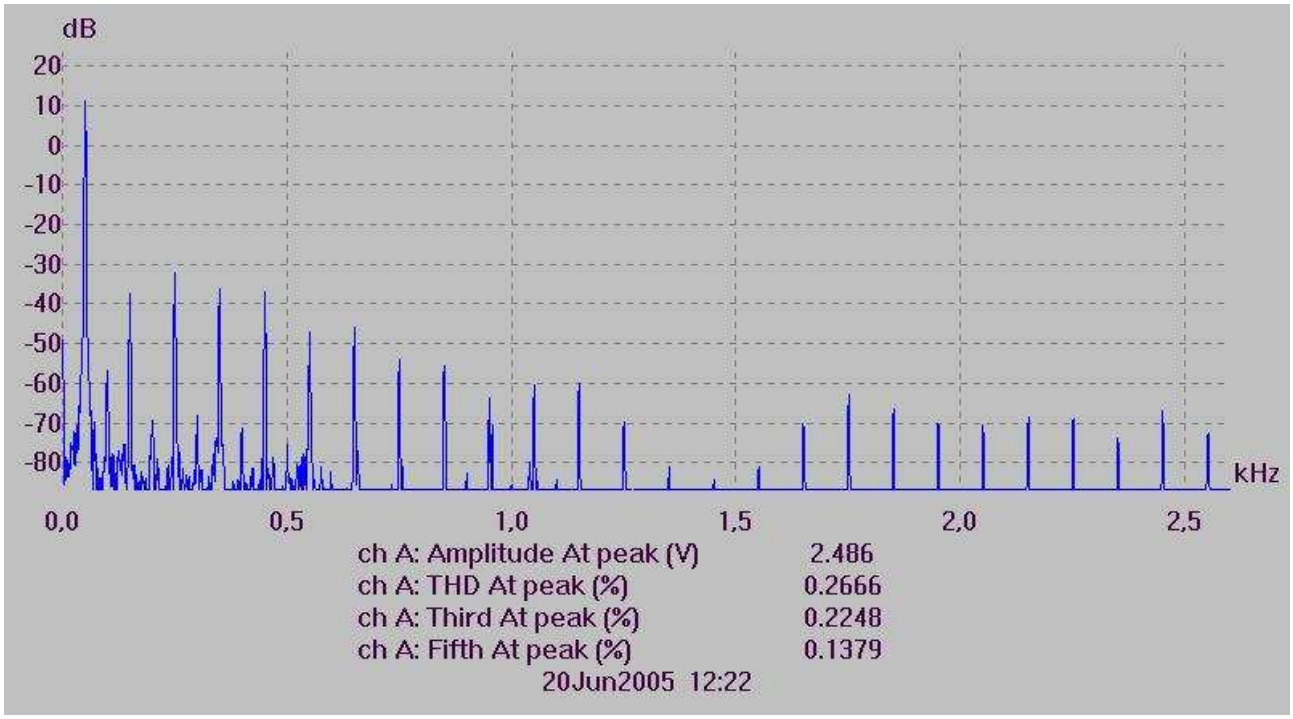
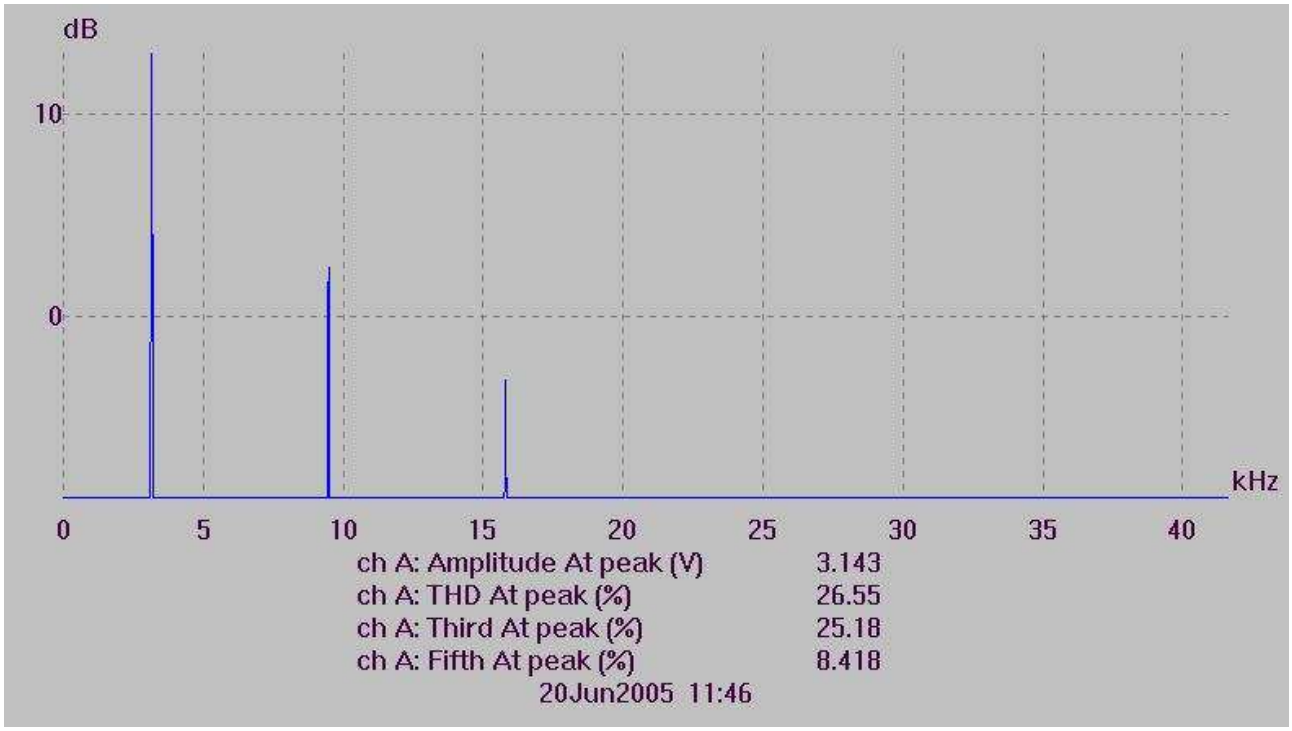
SQUARE SIGNAL FORM (DUT input signal):



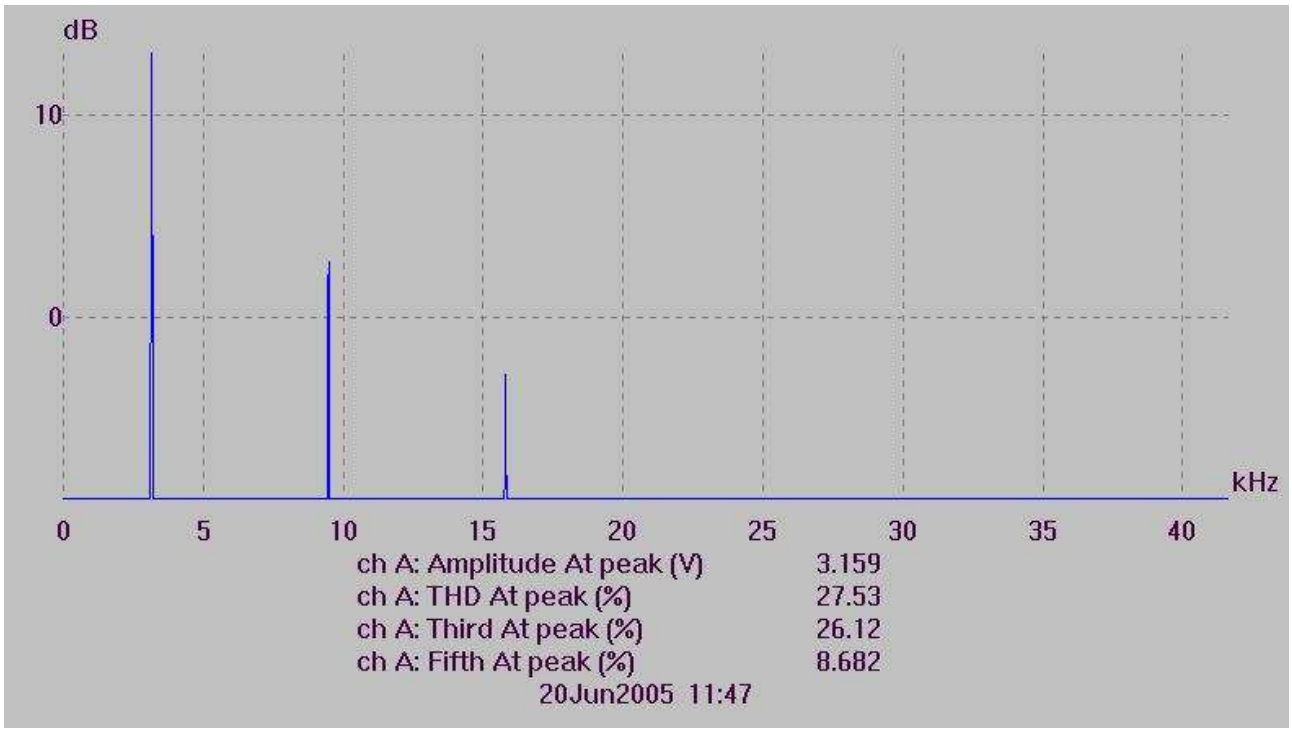
EMF SIGNAL FORM (on 8ohm load):



TEST EXAMPLE (G.Clm3875 Amp. No EMF) :



TEST EXAMPLE (G.Clm3875 Amp + EMF):



TAB2 Measures results:

MODELs	TOTAL ERROR %(7Harm sum)	3Harm error %	5Harm error %
D.S. Load-Invariant	+0.5	+0.6	+0.1
My Ref	+0.2	+0.4	- 0.6
GC (LM3875)	+0.9	+0.9	+0.2
JHL(10W base)	- 0.3	- 0.3	- 0.2
My 2030 (10W)	+0.2	+0.2	0

Preliminary conclusions:

The sum of these results had shown that this test method permits to analyze the amplifier – loudspeaker interface better. Even more importantly, it is possible to find a coherence between the measurement data and listening experience. To demonstrate this, let me include here some verification procedure that I have executed (A practical example of tonal balancing chapter).

Summing it up in a few words, we can say that those amplifiers which have received a [+] signs in these measurements, tend to "emphasis" their output at those characteristic frequencies, while being exposed to Back-EMF. [That is, with reactive loads]
The auditiv effect, as a consequence, is a very detailed, but (if value is too tall) aggressive and exalted sound.
On the other hand, those amps with [-] signs tend to compress the sound at the frequencies of interest, proportionally to the injected EMF. The result is a "soft" sound at these frequencies. Easy to listen, but gives the impression of the details lost in the process.
Those amps with small deviations [or nothing at all] seem to be "neutral", and can guarantee this across a wide range of different loudspeakers. [They "couple" better with the speakers].

Another important element: the linearity as a function of frequency. Looking at the table, it can be noted that some amps react differently at different frequencies. Most of them tend to "attenuate" their response to the Back-EMF excitation in the higher frequency ranges. The JLH amp instead gives an equally uniform response over the full audio band. This results in a very clear sound at higher frequency ranges. My_ref, on the other hand, behaves differently: it reinforces the mids and attenuates the highs, thus creating a "soft" and dynamic sound, but not so neutral like the JLH.
The other models, while remain quite coherent, are generally more sensitive to EMF excitation, [their mean error level being 0,5 – 0,9 %] which lends a rather hard sound character to them.
To be noted also the fact how ineffective the "static dumping" [created by NFB] is, in contrasting real world EMF signals. The result of this – in case of amps with a classic topology – is a strong accentuation of the low frequency back-injected components, while having a higher attenuation at the higher frequency ranges – due to open loop gain loss [and internal phase shift ?].

PS: the considerations in this chapter are indicative and subjective, and they hold account of the feelings of tonal equilibrium of a amp, apart from its general quality. A good tonal equilibrium doesn't mean that the sound is excellent…

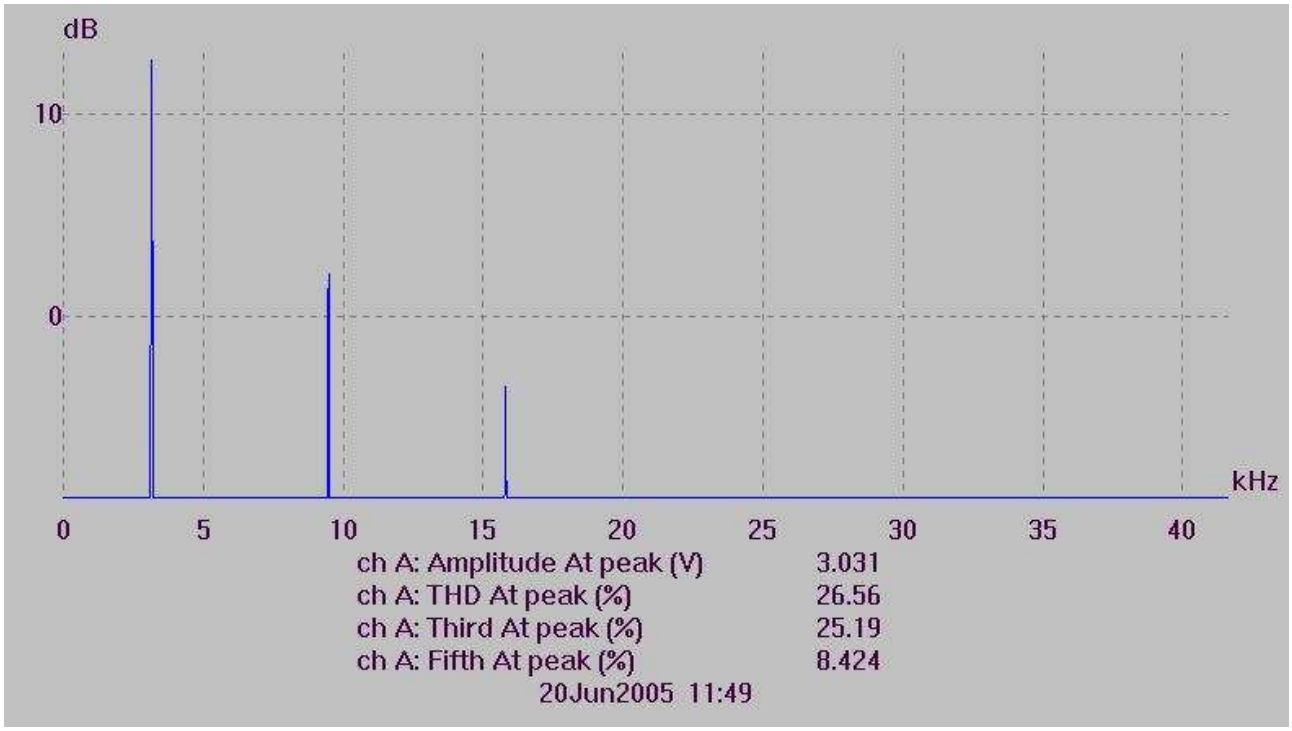
A practical example of tonal balancing:

Although the data shown above are useful, I feel like they do not demonstrate objectively enough my findings. For this reason I decided to include here this last chapter, introducing a method for the linearization of the amp – speaker interface, based on my measurement technics. I think the results obtained in this example will demonstrate by themselves the capacity of this setup, simply because the modification to the amp that I had to make so as to get better results in the test is coinciding with a well established “audiophile tweak” to these specific circuits.

OBJECTIVE: to improve the interface linearity of a GC (LM3875)
SOLUTION: To reduce the sensibility of the feedback loop to EMF [NFB is the main culprit in this problem] We will add a resistance [.27 ohm 5W] in series with the output so as to decouple the negative feedback loop from EMF and to decrease the dumping factor.
RESULT: a drastic improvement in immunity against EMF & a more “balanced” sound [see following FFT graphs] To be noticed the popularity of this tweak amongst GC fans! [a series output R]
CONCLUSION: I have measured and resolved a problem, which is “heard” by many.

With this method I have modified My_ref in a way that the variations across all the harmonics in the audio band became less then 0,05% - the results are imaginable..

GC+027ohm no EMF:



GC+ 0.27ohm + EMF: