

**Peter Adamson**

**Crackling good stuff: changing expectations  
Part two**

We've heard quite a lot about noise reduction during the last couple of days, and in particular references to our old friend crackle. Now there are some impulse noises that we definitely do want to keep – you may have already heard George Brock-Nannestad's copy of this record of Albeniz's piano piece Torre Bermeja, featuring castanets – but what have we here?

[EXAMPLE 1: WAV (96KHz); MP3 (44.1KHz)]

You could just hear the castanets rustling away in the background there. You may possibly have thought that the recording of the piano is not bad for 1936, but where are the castanets? (I suppose George in particular will want to know where they've got to.)

Well, I suppressed the castanets *digitally* – not a difficult process, as the sounds are mainly just big clicks. Now, this is a reminder of how the record should sound – my copy has quite a good surface, and this is a slow-speed dubbing done à la Peter Craven at 33rpm (but this one has ended up as a 96KHz sample rate transcription):

[EXAMPLE 2: WAV (96KHz); MP3 (44.1KHz)]

I hope that you didn't mind hearing that amazing record again. I must say I was surprised to know that such a recording was possible in the 1930s.

In fact the thread running through all this session may be summed up in the deliberately ambiguous subtitle of our presentation: *changing expectations*. It could mean that 'people's expectations are changing' (everyone expecting very low noise on everything, or dismal sound on old records); or it could mean that 'expectations *should* be changed, and here are some ways of doing it'.

One expectation has already been dealt with extensively – the expectation that an old recording must sound 'antique' and undynamic.

Here is a further demonstration of the same faulty expectation – together with a hidden and, er, unexpected expectation. Lotte Lenya recorded excerpts from Kurt Weill's *Dreigroschenoper* (in December 1930, I think it was), and these have been reissued a number of times. Here's a really *bad* version of the *Barbarasong*, introduced by Kurt Gerron, on a reissue clearly based on the presumption that the sound must be suitably 'ancient':

[EXAMPLE 3: WAV (44.1KHz); MP3 (44.1KHz)]

Next is a distinct improvement – but why, I wonder, the silly bathroom acoustic?

[EXAMPLE 4: WAV (44.1KHz); MP3 (44.1KHz)]

Now at last we have a proper 78rpm pressing – I was pleased to find this late Scandinavian Telefunken copy in good condition:

[EXAMPLE 5: WAV (44.1KHz); MP3 (44.1KHz)]

But, oh dear! This isn't right at all – this issue must actually be a dubbing by Telefunken from a genuine original pressing, because here is what it should sound like:

[EXAMPLE 6: WAV (44.1KHz); MP3 (44.1KHz)]

And yes, there were indeed slight differences in the pitch – but that's all part of the listening experience, and I've just left them 'as is'. I think the better commercial reissue was probably made still from the dubbed version – the expectation there was probably that a 78rpm pressing must be equivalent to the original recording. Only someone who'd heard the original would have recognised the problem.

(I think it takes so many years off Lenya's age, if I was her and still alive I'd probably sue the first company for misrepresentation.)

Next, we have expectations about digital processing – particularly *over*-processing, of course. You might class this as a 'simplification' of the sound – certainly my early experience with recording to digital audio tape was that the sound was clean, yes, but somehow simplified compared with the original. A more modern process of course is the MP3 type of signal reduction – in other words, *deliberate* simplification so as to take up less storage space. But is it always really simplification? Here's an example that may raise some doubts – subtle, but significant (I should say that this is not an MP3 file):

[EXAMPLE 7: WAV (44.1KHz); MP3 (44.1KHz)]

That's an excerpt from Pfitzner's Symphony in C recorded by him in Germany in 1940 soon after its first performance. I've done a certain amount of digital cleaning up – you might call it 'simplification', but the sound still seems basically fine.

Now here's what happened when I transferred the file to my iPod – an MP3 file at 128K bits per second, incidentally. It seems not bad in the loud parts (although a little coarser) – but listen to what happens as the music gets quieter: all sorts of odd wee holes and gargly effects appear.

[EXAMPLE 8: WAV (44.1KHz); MP3 (44.1KHz)]

I thought I'd got a fault on my iPod when I heard that. It's not a nice sound, and a poor portrayal of the orchestral playing, so that the musical performance is badly compromised – something to consider when studying what might be called a 'presentation copy'. Maybe the noise reduction simplification interfered in some way with the MP3 simplification.

Just to redress the balance a bit: listen to this excerpt of a show song by Al Jolson, dating from 1918, also in a compressed format:

[EXAMPLE 9: WAV (44.1KHz); MP3 (44.1KHz)]

You may be surprised to know that I downloaded that from an Irish radio broadcast – on the Internet at a mere *seventeen* Kilobits per second! So expectations – either way – about low bit-rates and use of MP3-type compression may need to be informed.

One thing that has interested me is the facility on various sound processing computer programs – especially those for removal or reduction in background noise – for checking on what has been removed; that is, a direct difference between the original and the processed audio data. You can, of course, get some similar results

by simply taking the original file and the processed file as *data* and then doing the numerical subtraction, sample by sample.

In the following examples, I want to show that your expectations about what is removed may possibly be misled:

Here is Artur Schnabel playing the opening of Beethoven's Sonata op 110 in 1932:

[EXAMPLE 10: WAV (44.1KHz); MP3 (44.1KHz)]

And this is what we're now going to remove: you'll hear that there are some odd wee bits of the piano sound, not very musical and not very loud, but still there. Maybe it won't make much difference to the music if we remove this stuff – this is what we want to remove: noise and crackle:

[EXAMPLE 11: WAV (44.1KHz); MP3 (44.1KHz)]

Now, what do you think the result would be if we did remove the part of the sound that you've just heard? Well, here it is:

[EXAMPLE 12: WAV (44.1KHz); MP3 (44.1KHz)]

Rather weird, isn't it! No noise, but sounds to me a bit like a glass harmonica.

Now let's have another go, starting from the end result instead: here's the same original recording with an extremely *small* difference which is the result of doing a bit of simple digital processing – the difference is so small that I can absolutely guarantee that you would not be able to hear it under *any* circumstances:

[EXAMPLE 13: WAV (44.1KHz); MP3 (44.1KHz)]

Now let's hear the difference between that and the original audio file – just subtract the final result from the original (take one file and subtract it from the other one) and we might *expect* to hear nothing, or nearly nothing, as the difference is so inaudible. But, instead we get this:

[EXAMPLE 14: WAV (44.1KHz); MP3 (44.1KHz)]

Well, you might say that this time we've removed an awful lot – and it sounds awful, too! The tiny difference is a just a one millisecond delay – the second version was absolutely identical to the original but delayed by one-thousandth of a second, and so the simple numerical difference between the data files was enormous, as you could hear.

So you cannot always rely on a simple difference between original and processed versions. These examples were extremely crude, but you may like to consider what might be happening in more subtle cases, where "what you've never known, you'll never miss!"

One of the dangers of coming last in this symposium has always been the possibility of being pre-empted. My presentation as advertised in our abstract was going to finish with an investigation into your immediate reactions to different levels of crackle levels on two different transcriptions. But alas I was again upstaged – this time by Roger Beardsley, who casually threw in a demonstration which was so similar to mine that I had to go and organise something else (overnight!).

So I decided instead to include other material I happen to have to hand – and at least I can let you hear something dear to my heart, and not covered by anyone else so far: Berliner discs. If you want to know more about these, do please talk to me afterwards.

The main thing just now is that they are the earliest commercial recordings made and sold as flat discs, and they just fascinate me! As I have the privilege of owning a fair number of these, this is an opportunity to let you hear a few unusual early discs that extend the thread of the unexpected – not perhaps expectations that *should* be changed, but still quite fun.

On the first disc we have a mad French accompanist, in Paris 1899: this recording is *supposed* to be *La donna è mobile* sung in French (as *Comme la plume au vent*) in a setting that would have raised Verdi's eyebrows (if not his hackles). I think that frankly the pianist was a little tipsy, or perhaps just bored – he certainly isn't playing from a score. The singer – a Monsieur Bru – seems to be quite unfazed by this and ploughs on unperturbed; perhaps he was colluding – or just not listening:

[EXAMPLE 15: WAV (44.1KHz); MP3 (44.1KHz)]

When I bought the next disc, I had a nasty shock, in an area touched upon several times in this symposium – see how soon you can spot it before it becomes obvious.

[EXAMPLE 16: WAV (44.1KHz); MP3 (44.1KHz)]

Well, I knew that there was something slightly wrong when I first played it, but I wasn't prepared for that! That was poor old Michailova in St Petersburg in 1901. There is a slight pitch rise throughout most of the side, which takes a sudden leap at the end. Here's the same disc after a little gentle tidying up – and a definitely invasive assault on the pitch problem.

[EXAMPLE 17: WAV (44.1KHz); MP3 (44.1KHz)]

It's not perfect – I'm sure that the pitch went down very slightly a bit at one point – but it's very tricky to do that.

Lastly, as we've had a number of castanets in these talks, quite unexpectedly – apart from George's, there were other ones as well (some not mentioned, in passing) – I shall now leave you with even more castanets, this time included on an 1899 disc from Madrid: this is Señor Mochuelo with the first part of his Sevillana:

[EXAMPLE 18: WAV (44.1KHz); MP3 (44.1KHz)]

I think you can see one reason why I like collecting these records – there are the sorts of things that would not happen anywhere else.

Anyway, thank you very much for listening to me. I'm sorry that I wasn't able to do the particular trickery that I was intending to do, but it gave me the opportunity of letting you hear some of these very early discs – so, thank you.

### Audio examples

1. Albeniz: 'Torre bermeja' (arr. castanets + piano):  
Manuela del Rio (castanets) + L Campioletti (piano):  
HMV X4711 (OLA1082-1, Paris, 1936)  
castanets removed digitally, as 'clicks'
2. as 1. with castanets, as original
3. Weill: *Die Dreigroschenoper* 'Barbarasong':  
Lotte Lenya (soprano), Kurt Gerron (announcer)  
+ Lewis Ruth Band cond Theo Mackeben  
[via reissue: Capriccio 10 346]
4. as 3. [via reissue: Teldec 6.41911 AJ]
5. as 3. [from 78rpm: Telestar (Scandinavian Telefunken) A754  
= dubbing (15909-50, =?1950)]

6. as 3. [from 78rpm: Telefunken A754 = original pressing (15909, December 1930)]
7. Hans Pfitzner: Symphony in C op 46, I. Allegro moderato:  
Berlin Philharmonic Orchestra/Pfitzner:  
Grammophon Meisterklasse 67604 (1519 GS 9, 1940)
8. as 7. via MP3 file at 128Kbps data rate  
[iTunes conversion on Apple iBook]
9. *Sinbad* 'I'll say she does'  
Al Jolson + orchestra: (November 1918, US Columbia A2746?):  
played on RTE (Irish Radio) programme 'Bowman Sunday Morning'  
[in first of two programmes to celebrate the anniversary of Thomas Edison's phonograph patent, 19 February 2006]  
taken via Internet / dial-up 'Real Player' file at 17Kbps data rate
10. Beethoven: Piano Sonata op 110, opening bars:  
Artur Schnabel: HMV DB1957 (2B2609-1, London, 1932)
11. as 10. digitally reduced to crackle, noise, etc 'to be removed'
12. difference = 10. – 11. [numerically, sample by sample]
13. = 10. but delayed by 1ms
14. difference = 10. – 13. [numerically, sample by sample]
15. Verdi: *Rigoletto* 'La donna è mobile'  
(in French as 'La plume au vent'):  
Monsieur Bru + piano: Berliner 32576 (3290, Paris, July 1899)
16. Donizetti: *Linda di Chamounix* 'Cavatina'  
(*'O luce di quest' anima'*):  
Maria Michailowa (soprano) + piano:  
Berliner 23206 (1762B, St Petersburg, November 1901)
17. as 16. cleaned up + speed/pitch changes largely corrected
18. 'Sevillana I':  
El Mochuelo [Antonio Pozo] (tenor, with guitars and castanets):  
Berliner 62577 (3484, Madrid, August 1899)