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Let them sing – the records will if you allow them

Why 'Let Them Sing'?

For the last 40 years, I have always worked on the basis that historic recordings do not have to sound poor, and need not, if they are reproduced properly. And therein I believe lies the key. Crucial to that is one of my constant themes - 'Signal Path Integrity'. The sound restorer (or indeed any sound engineer) ignores it at their peril. If you let the record 'sing', it will, but not if you put barriers between it and the listener. In both sound recording and reproduction, the simple and well designed solution, is usually the best solution. The old KISS principal.

It is as true today as it was 50 or even a hundred years ago. How often have I seen an engineer place far too many microphones at the recording location, then, when in the control-room reaches straight for the EQ when it doesn't sound right. EQ will not compensate for poor microphone technique, just as a bank of processors will not make an old recording sound good, if the basics of replay have been ignored.

What I want to talk about today mainly relates to the restoration of material recorded on disc, because it tends to be the most difficult to do well, and there are far more discs around than tapes, although many of the parameters are similar. I'll be giving you examples by way of illustration, and I'll be asking for your assistance too.

We blithely talk about it, but what exactly is sound restoration? In many ways, it's similar to the work of a picture restorer. We both remove dirt, repair damage, and try to allow the original image to shine through once more. I often liken it to opening a window on a past performance, and the less that gets in the way, and the more accurately we recover the original signal, the wider is that window.

I mentioned dirt, and in our case, dirt means both the physical dirt on an old record, and the noise generated by the material itself when in contact with the playing stylus.

Allowing the image to shine through, involves playing the record in the best possible way, using the right equipment to extract the musical information lying in the grooves. We now have over 100 years of recorded sound, so there's plenty of important material to work on, from every area of music.

There are many companies now issuing CDs of historic material from 78 rpm disc sources, partly it must be said, because it is out of copyright. Some companies do it very well, others shall we say, with less success.

What I'd like to do first, is to play, and talk about, a few examples to illustrate.

This first one is a wartime, probably 1941 recording, by Bud Flanagan – he of the 'Dad's Army' theme song, and not perhaps your usual fare I realise, but it suits my purpose here, by comparing a good transfer with what you'll hear is a poor one. This first version was issued by a well known company with many important issues to its name. The 'Buddies' referred to relates to Britain & America as wartime allies.

[Track 1. (Version 1)]

What's the general opinion on the quality of that transfer? Bearing in mind the age of the original of course. Marks out of 10 say.

(Discussed results – these varied but an average was 7/10)

As it happens, I was asked to include that transfer on a licensed compilation I was preparing. I didn't know the record, but in any case, I always prefer to work from the original. So, I obtained a pressing and proceeded to play it with the usual replay characteristics that work for wartime Decca. This is the result, without any processing apart from gentle de-crackle. But it starts with a brief reminder of the first version.

[Track 2. Version 2]

Do I need to comment further? Do you want to re-mark the first one? As you could hear, it actually turns out to be quite a decent recording.

So, what went wrong?

Two things I believe, lack of technical and musical knowledge, and the perceived imperative to reduce noise at all costs.

The lack of technical knowledge meant that the engineer had no idea how to reproduce the recording properly in the first place. It would have sounded better on a 1941 radiogram.

Then there is the problem we all face, dealing with the old trouble of noise. In pre-digital days, all you could really do was filter, to make it less obvious, but the high frequencies were affected.

Later, there was a groove-wall switching device by Packburn, which continuously selected the quietest wall, and in theory quite good, but the effects when driven even moderately, were very variable.

Then came CEDAR and other digital noise reduction systems. Despite its price and relative age, CEDAR is still the only system for the professional. The De-Click, and De-Crackle algorithms are second to none. But, like all signal processing devices, they have to be driven, and used with care.

Even with CEDAR, there comes a point where the music signal becomes affected. Initially the effects are quite subtle, but as you will hear, it can become intolerable. This next example is what has happened when someone went too far, especially when trying to use the tape De-hiss module, to remove the low-level hiss-like noise that remains on 78s after de-click, and de-crackle, with sadly horrid results – as you can hear:

[Track 3. Version 1]

The residual hiss has been replaced by intrusive artefacts. This is the same record, without the processing:

[Track 4. Version 2]

Then there is the physical dirt. Even visually clean records are likely to have clogged grooves. In 78 days, records were played with steel or fibre needles (not styli), and these wore away during playing. Where is that worn-away material now? In the groove, and it is another barrier between us and the original signal.

In view of this, it is astounding that few even bother to clean the records properly before transferring them. That is what came off some records of the Busch Quartet, and they appeared visually clean. Pass it round – it's not a weapon a mass destruction!

That stuff is made up of dirt, dust, nicotine and the bits of the needles worn away during playing. All mixed with moisture from the air, then hardened in the groove by age.

Without cleaning, the result is that they are playing the surface of the dirt, not the record. The dirt is poor copy.

Now something which I hope will make you think. You've just heard two of many, really bad transfers by engineers with access to the best modern replay equipment. Now listen to this, a first class transfer, and not by me originally I might add.

[Track 5]

Anyone like to hazard a guess when that transfer was made?

That was made 76 years ago. When playing-weights were measured in ounces. I am happy if I can do as well. But why was it a transfer from 1930 in the first place?

A problem in 78 days was record wear. If a record wore out too fast, it was a bad advertisement, and so all records were subject a wear test, typically 50 playings. Usually it was a case of too loud a recording, or too much bass that caused the trouble.

That track, by Josef Schmidt proved to be too powerful in the bass to pass the wear test. So the engineers played a pressing, re-equalised it and made a new wax master from the resulting signal.

Pretty much what we do today when making a transfer, but they had none of the equipment we have now. Just think what HMV engineers had available to them in 1930, when few people even had an electric gramophone.

I wish I could play that to every transfer engineer who ruins good sound.

But back to noise, our ever present friend!

The truth is, that however good a noise-reduction system may be, there are limits to the amount of noise that can be removed before signal, and therefore music degradation takes place. Where this happens, is regularly, and heatedly, discussed in the pages of various journals and elsewhere, with almost no-one really agreeing. It may be a reduction in high frequencies with muddied sound, loss of ambience, or problems with artefacts, that is commented upon as being caused by over processing. And it can happen as you have heard.

Whilst I have you captive, I'd like to take this opportunity, to get your opinions on when, in particular, frequency degradation becomes apparent or perhaps even unacceptable. To have such an expert audience is too good a chance to miss.

I'm going to play a recording, which lasts around one minute thirty seconds, and has the noise progressively removed until there is virtually nothing remaining. After the

first 20 seconds or so, the reductions take place roughly every ten seconds. And whilst it's playing, I'll change the appropriate section number on the front, here.

When it's finished, I'd like to find out what the general opinion is, as to when further processing was having an effect on the reproduction. So perhaps you could mark one of your papers suitably.

The recording by the way is from 1933 and the singer Elizabeth Rethberg.

[Track 6]

Well, what was the general view I wonder. I can't think anyone would object to the first two stages, but after that? Anyone feel that stage 3 or 4 marked a difference. What about 5 or 6?

(Average was around 3-4 out of 10 steps)

Discussed at length!

Now the thing about that recording, was that it was transferred from a metal positive – like this one - made directly from the master shell. And there was no noise on the metal. The noise in fact was added by me from a plain groove test record of 1930. All I did was to reduce its level on the digital mixer. No CEDAR or other noise reduction was used at all. It was not done to fool you, but to show, how easily the ear can be misled, in either direction.

In this case, the ears can be fooled into thinking that there are greater levels of high frequency information, when high frequency noise is also present. So it is just as easy to under-drive noise reduction, as to over do it. The trick is to remove as much as will come out without upsetting the music, and replacing one problem with another.

Back to barriers between us and the sound.

The key to success, is for the engineer to learn - about the past, the equipment, and to really listen.

So much can be lost in transfer when the engineer does not have the right knowledge or expertise and does not, or cannot hear what is going on. Too many do not know what real, live music sounds like. Many of you are so lucky in having live music all around you. Many engineers do not, and just as importantly, have suffered irreparable damage to their hearing by listening to the extreme sound levels of rock music, either at nightclubs, or in the studio.

The sad fact is, that they can no longer hear the differences between good and bad sound reproduction. Thousands of distorted watts have seen to that. As for nuances, it is not worth bothering to ask. So encourage the young to look after their hearing.

When people come to my studio and see the racks of equipment, I'm often asked: 'which is the most vital and important for the engineer'. The answer is of course ones ears. Mine are my livelihood.

And too few have any idea how the sound got onto the record (or tape) in the first place. Without that knowledge, I believe you will never get the best out of the medium you are working with.

To make good transfers, the trick is to let the original recordings ‘sing’. And they will if you let them and don’t try to make them into what they are not. One producer/engineer in Canada boasts of using 23 different computer programmes to process his transfers. And it sounds like it.

Another, screws the noise reduction so far, that the reverberation tails disappear, and then adds artificial echo to compensate.

Then there are others who use so many analogue processors that the result is like a fog on the M25. This is sad, and unnecessary – they do not understand how these units work. Properly used of course, they are invaluable. Some even use what are little more than music-centre graphic equalisers.

There is also the idea, that if you have processors and equalisers, you must use them. The equaliser should only be used when really necessary. Too often today, as I said before, an engineer will reach straight for the eq instead of getting the microphone positions right in the first place.

Most recordings from what is known as the electrical era – i.e. from 1925 when the microphone replaced the acoustic horn – are well made and can sound very good. The equipment designers and recording engineers then, knew what they were doing. And I often find that little eq is ever necessary providing you get the basic replay curve right.

A few examples now will I think be in order.

We tend to think of live performance recording as being a post-war thing, made possible by the introduction of magnetic tape, but the practice began much earlier.

Here’s Feodor Chaliapin in Boito’s Mefistofele, live from The Royal Opera House, Covent Garden, **80 years ago.**

[Track 7]

There are plenty of engineers who could not do as well today, I venture to think. And that was recorded via telephone lines to remote recording lathes in Gloucester House, London.

In 1929, the great Yorkshire tenor, Walter Widdop gave us the stunning, ‘Lend me your aid’, from Goldmark’s ‘Queen of Sheba’. A typically fine recording made in the famous Kingsway Hall, with Flash Harry in charge.

[Track 8]

Then, the Gramophone as musical historian, with Sir Edward Elgar, improvising, or ‘tinkling’ as he put it, at the piano in 1929 and of course not a public performance, but essentially a private one, and unpublished.

[Track 9]

Jazz and popular music was similarly treated with great care. Here are the State Street Ramblers in 1928 with Endurance Stomp.

[Track 10]

And finally Glenn Miller in an unpublished September 1944 recording made at Abbey Road, and from his very last recording session before his death in the December, when his plane was lost over the English Channel. Farewell Blues – very prophetic! It also shows just how wide the dynamic range on a 78 could be.

[Track 11]

(Peaks woke up the audience!)

Many developments in recording technology including the system that was used for that Miller side, were made by the EMI team led by Alan Blumlein. A true genius: by 1933, he had developed a stereo, or binaural system that used a single 78 rpm groove.

He used two microphones back-to-back, plus a centre microphone. The resultant signals were matrixed into two feeds - the sum, and the difference between them. Each of these was fed to the special cutterhead which modulated each groove wall independently. Playback is naturally the reverse process. It is very similar to the M-S recording system used today.

Here, from December 1933 is part of a binaural voice test. It is like opening a window on another age.

[Track 12. Walking Talking Stereo test]

As ever, recording technology was well in advance of the replay systems, and only now are we able to obtain full benefit from these extraordinarily vivid recordings.

Oddly enough, not everybody agrees with using modern technology to transfer early recordings. One company, which had, and still has I believe, a very large catalogue of historical CDs, prefers to play the records on a huge 1930s EMG horn gramophone, and place stereo microphones in front. This is a typical result:

[Track 13. Version 1]

Played in the normal way it sounds like this:

[Track 14. Version 2]

(Comment was made re. speed variation)

It is very reminiscent of the difference electrical recording made, over the old acoustic horn system.

Just for comparison, this is Giovanni Martinelli in 1924, followed by the electrical version of the same piece from 1926, to show what I mean.

[Track 15]

So in one stroke, they undid virtually all the gains of modern electrical recording.

The point I am again trying to make, is that old recordings do not have to sound bad. In most cases, it is caused by poor replay techniques carried out by frequently ignorant operatives. We should not put up with bad transfers of historic material. We have a duty to do the best we can, as faithful to the original as possible, with a level of cleaning-up and repair that does not harm the music.

And it is not just in transferring recordings that degradation takes place. The almost universal habit of recording onto computers is responsible for many problems. Here it is often the dreadful cheap soundcards that so many people use. That is the card that converts analogue to digital and back again. Good A/D conversion (and D/A) is essential.

Professional studios use converters costing thousand of pounds or more each, because they make such a difference. In pro-audio you usually get what you pay for. Sadly the average soundcard at £100 for both, does not do the job. Oh, and then the recording is put onto CD at 52 times write speed. And they wonder why it's not sounding quite as it should. If you could see the damage to the waveform, that I see so often, you would be appalled. The AES standard is up to 4 times write speed. For good reason.

Again it's down to a lack of knowledge and understanding.

I was originally planning to end here with one further fine recording by way of example, but recent exciting developments mean that I have what is really a world premier for you.

As some of you may be aware, I am part of the Historic Masters Committee. We work with the EMI Archive to produce limited editions of important 78s pressed directly from the original metal parts in the archive.

Late last year, whilst planning a complete Adelina Patti edition, I became aware that Deutsche Grammophon still had some HMV masters from before the first world war, when it was still a part of that company.

My contact checked some numbers and there in the vaults was an almost complete set of original masters of the Patti recordings, albeit that DG could not identify most of them. This I offered to do, as well as do the same for any more they had.

In due course an old handwritten list, in an obviously German hand arrived. As soon as I started work, it was obvious that as well as the Pattis, there was a group of important recordings from 1903, and long thought destroyed.

The artist was Francesco Tamagno, the tenor chosen by Verdi to create the role of the Moor, in arguably his greatest opera, Otello. Tamagno did make published records before he died in 1905, but they were mostly 10" made in 1903 and many of the masters soon wore badly.

In 1903, he also made a batch of the then new 12" records – a dozen in all. Only 3 were published and of those, one was deleted early and the master destroyed: the other two soon wore quite badly. A fourth master was discovered at EMI, and we published it a few years ago. Of the others, there was no trace.

But there on this list, were all 12, including four made for the private use of Tamagno only. You can imagine that I needed a very stiff drink shortly after. If I tell you that a battered test copy of one of these changed hands for over £7,000 some years ago you'll get some idea why!

I requested the loan of these metals so that stampers could be made, and a short time ago, they arrived. I made transfers to check them and was bowled over by the immediacy of the sound on these unworn masters. We will of course be issuing

pressings from them, probably next year, but I felt I had to give you the chance to hear Verdi's choice of Otello.

You are only the second, small group of people to hear this recording of Otello's entrance, from an undamaged and unworn master, in over a hundred years. I should perhaps add that in 1903, the voice was favoured in recordings, not the accompanist! It shows how good an acoustic recording could be,

[Track 16]

Track references

Track 1: Decca F 7910. Bud Flanagan, *Let's be buddies*, Cole Porter (1941)
Track 2: ditto
Track 3: HMV E464. Berlin State opera Orchestra, Leo Blech (conductor), extract from *The Magic Flute* overture, Mozart. BWR 473 I (November 4 1926)
Track 4: ditto
Track 5: HMV JK 2456. Josef Schmidt, Jota: 'Te quiero' (*El Trust de los Tenorios*), Serrano. BLR 5931 1T (January 1930)
Track 6: Odeon PO 170. Elizabeth Rethberg, 'Leb'wohl, freundlich Gestade' (*Africaine*), Meyerbeer. BE 10391 (May 4 1933)
Track 7: HMV (unpublished). Feodor Chaliapin, 'Ave Signor' (*Mefistofele*), Boito. CR 384 I (May 31 1926)
Track 8: HMV D 1742. Walter Widdop, 'Lend me your aid' (*Reine de Saba*), Gounod. CC 16794 I (September 27 1929)
Track 9: HMV (unpublished). Edward Elgar, improvisation, Elgar. CC 18131 I (November 6 1929)
Track 10: Gennett. State Street Ramblers, endurance stomp. 14065 B (July 18 1928)
Track 11: HMV (unpublished). Glenn Miller Orchestra, Glen Miller (conductor), *Farewell Blues*. OEA 10287 1 (September 16 1944)
Track 12: HMV (unpublished). Alan Blumlein and others, stereo test. Test 5768 2 (December 16 1933)
Track 13: Victor 1204. Tito Schipa, *Vieni sul mar*, Vergine. BE 35859 2 (September 8 1926)
Track 14: ditto
Track 15 (point 1): Victor (unpublished). Giovanni Martinelli (+ Rosa Ponselle), extract Act IV, sc. 2, *Aida*, Verdi. C 29450 (1924)
Track 15 (point 2): Victor 1744. Giovanni Martinelli (+Rosa Ponselle), extract Act IV, sc. 2, *Aida*, Verdi. BE 35459 3 (May 17 1926)
Track 16: HMV 052101. Francesco Tamagno, 'Esultate!' (*Otello*), Verdi. 10 R (February 1903)