



Interview / Entrevista / Entrevista

## **Franz Lechleitner. “Each Enhancement Finally Depends on a Subjective Approach and is Influenced by What is Seen as the ‘Best’ Final Product”**

by Isaac Raimundo (Faculdade de Ciências Sociais e Humanas, Universidade Nova de Lisboa, INET-md)\*

Franz Lechleitner was born in 1939 in Innsbruck, Austria. He studied communication engineering at the Technical University in Vienna and received a master degree in 1973. From 1973 until his retirement in 2004 he was in charge of the technical laboratory of the *Phonogrammarchiv* of the Austrian Academy of Sciences. In the course of his engagement in the archive’s work he has focused on re-recording of historical mechanical sound carriers. In 1985 he developed a cylinder replay machine which has seen several upgrades since. With this device, he was engaged in several re-recording projects in the Netherlands, Israel, Germany, Slovakia, Latvia and Georgia, Denmark, Czech Republic. Since 2005 he is Consultant at *Phonogrammarchiv* and since 2008 free lancing Audio Consultant. Moreover, he is Life-Member of the Audio Engineering Society.

**Isaac Daniel Raimundo:** We live in a time where sound is recorded almost ubiquitously, in multiple formats and supports. In this sense, how does a phonographic archive manage this growing trend?

**Franz Lechleitner:** Any audio-visual archive is aware of these trends today. The archives meet such new challenges in different ways –mostly following their respective orientation. As Edmondson has pointed out, audio-visual archives can be classified – according to character and emphasis– into broadcasting archives, programming (television) archives and audio-visual museums (preservation of the respective artefacts). Within sound archives we find national or regional, city and local archives as well as university and academic archives, and furthermore there are thematic and specialized archives, to mention just a few. All of them have different approaches and duties. Since its foundation in 1899, the *Phonogrammarchiv* of the Austrian Academy of Sciences has been regarded as the world’s first research sound archive. The collection policy allows only for recordings made in the

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course of research projects, for audio/video recordings mirroring primary sources indispensable for the respective research. The *Phonogrammarchiv* is regionally open, and it is open to all disciplines –but the researchers are mostly in contact with the archive in order to be informed about technical equipment, its handling, and the required and necessary documentation, etc. Thus, the collections mirror Austrian research. Concerning their collecting activities, phonographic archives follow distinct rules. A national sound archive has a completely different approach from that of a scientific archive like the *Phonogrammarchiv* of the Austrian Academy of Sciences, which has been following its mission statement from the very beginning: only collections well documented and in distinct formats will be accepted.

**IDR:** Assuming that the correct preservation and conservation of historical phonograms require very specific guidelines, what criteria should a phonogram archive take in order to handle them? Are those actions based on the state of degradation of the sound carriers, or are they related to issues of political significance?

**FL:** A phonogram archive dealing with historical carriers has to follow the knowledge and state-of-the-art re-recording and digitization as described at length in the International Association of Sound and Audiovisual Archives –Technical Committee 03 and 04 guidelines. Priority must be given to actions preserving the carriers (based on the state of their degradation).

**IDR:** According to your experience, do you think that countries throughout the world are changing the way they look at their sound heritage? Do phonographic archives play a part in that change?

**FL:** Due to globalization, sound heritage gains importance in all countries, which is also mirrored in the intangible heritage lists of UNESCO. Thus, phonographic archives play an important part in bringing back the heritage to the people.

**IDR:** We could say that cultural activities have a tendency to follow trends. Concerning sound heritage preservation, do you think these are generational issues, technical issues or something else? Is the digitization of phonograms enough for the preservation of sound heritage, or are other concerns to be taken into account? What about the preservation of the digital carriers and related media?

**FL:** The digitization (i.e. the adequate re-recording and correct transfer in the digital domain) of the phonogram is by no means enough. The digital sound image consists of a

certain amount of data, which are fixed as files on a hard disc or are kept on the server of a phonographic archive. In order to keep the sound alive, you have to set flanking measures, like additional storage in different places for backups in case of data loss.

**IDR:** Since sound archives involve several academic disciplines and professional specializations, do you think this multiplicity is being taken into account?

**FL:** Indeed, re-recording is a difficult procedure. Ethnologists, linguists and experts from social sciences or zoology are a big help in finding the correct speed of certain recordings. There is a big difference between commercial recordings and non commercial field recordings. Commercial recordings are recorded at fixed speeds used by the different companies. Scholars used their own speeds distinguishable on reference tones, if available. And even then an expert has to control it to be on the safe side.

**IDR:** Is the procedure of replaying and transferring the sound carrier a purely technical process, or do we have to take into account other relevant expertise?

**FL:** Problems or questions of speed, pitch, loss of contents etc. ask for assistance from other disciplines, e.g. native speakers and experts in the respective culture (concerning musical instruments, timbre of voices, etc.). Years ago, for example, I had to re-record a batch of wax cylinders containing bagpipe music. I selected the most likely speed. Having re-recorded almost two thirds of the batch, one cylinder turned up with a reference tone. I did the job once more, but the expert was of the opinion that it was wrong. Therefore we decided to find the correct speed with his assistance. Digitization is not only a technical procedure; there are parameters involved beyond the scope of a technician, e.g. commercial recordings with non-standardized speed, sound and phrasing of languages or music. The technician therefore needs the support of other experts as well.

**IDR:** Every historical sound carrier, be it a shellac disc or a magnetic tape, imprints its own idiosyncrasies into the sound. To what extent should we keep these particularities, or should we use the best digital technologies available in order to remove audio artefacts?

**FL:** In a first step, you have to keep all idiosyncrasies; this means that you keep a rough transfer with all its peculiarities in the highest quality (96 kHz, 24 bit). Afterwards you apply the best digital technologies for sound enhancement, removing the artefacts but not touching the content; such technologies are still being improved. Each enhancement finally depends on a subjective approach and is influenced by what is seen as the "best" final product.

**IDR:** What do you think about the possibilities of new digital processing techniques of audio restoration? Do you think they constitute a cure for the maladies of historical carriers, like surface noise in the case of shellac discs, or do you think there is still much to be done in the mechanical/electrical domain of an audio transfer?

**FL:** The new digital audio processing techniques are by no means a solution for all deteriorations on historical sound carriers. Still, the best result will be achieved when following the rule of making the most correct analogue transfer first. It guarantees the optimized use of digital tools. For instance, out of centre or warped records deliver an analogue sound polluted with wow and flutter, which cannot be restored with digital techniques. In the mechanical domain you have to keep attention to cleaning and if necessary flattening records. The records have to be centred carefully in the replay mode in order to avoid any swinging of the needle. If you use a one-pivot tone arm, the anti-skating has to be set, too, in order to ensure correct groove tracking. Vertical-cut records with very shallow grooves ask for a linear tracking arm because you will not find an anti-skating position suitable for the whole side. At last you have to select the proper needle. For mono records playback with a dynamic mono cartridge will give best results, but the playing side has to be perfectly flat, otherwise every vertical movement will cause more distortion than when being replayed with a stereo cartridge. You have to keep in mind that mono cartridges have no vertical compliance. In the case of electrically recorded items, analogue equalization is still common practice, but equalization in the digital domain is getting more and more important despite the fact that you are not able to correct the phase of the equalization network in the provided manner. Finally, you will judge the audible result with your ears only.

**IDR:** Assuming that every sound carrier is historically and technically related to the corresponding replay equipment, how do you think an audio archive should deal with the question of obsolescence of these apparatuses?

**FL:** In this case I advise to contact an archive or an institution which possesses well-maintained equipment as well as technical competence to do such a job. It will not make sense to look for a second-hand equipment without knowing about the technical status.

**IDR:** Most often, the replay equipment of rare audio or video carriers is old and the replacement parts are scarce. It is therefore sometimes necessary to build new ones. Another aspect is the chemical degradation of carriers such as magnetic tape recordings or, as you have mentioned, the extreme degradation we encounter in some lacquer discs. So is it relevant for an archive to have a conservation/restoration, an electrotechnical, or even physics/chemistry department?

**FL:** Ideally, an archive has all the departments required for safeguarding the sound carriers in question. Otherwise you need an expert on every type of blemish in order to decide upon the degradation and its remediation. In addition, the expert has to give close instructions which company/person will do the job in a proper way.

**IDR:** Nowadays, we observe a re-emergence of replay equipment and sound carriers previously considered obsolete, with vinyl and magnetic tape being sold again in street shops. Do you think this trend is beneficial for the understanding of the value of historical recordings?

**FL:** The question is if such behaviour is a widespread trend. In any case, the recognition of analogue sound seems to be evident and maybe leads to an increased awareness of historical recordings. The invention of the CD was a big step in technical sense, but sound quality is a subjective value. Not everybody could follow the digital rules of signal processing an enhancement applied to historical analogue recordings. Parallel to the CD an improvement of the analogue Vinyl LP took place addressing people who were dissatisfied with the CD. New editions of valuable analogue recordings unknown until now nowadays are issued on CD and Vinyl.

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### **Biography / Biografía / Biografia**

Isaac Raimundo was born in Leiria, Portugal, in 1979. He played flute for 10 years and completed his BA in Music –Production and Technology in the Superior School of Music and Performing Arts of Porto. After a specialization in acoustic engineering in the Instituto Superior Técnico –Lisbon– he developed acoustic instrumentation for road noise assessment in the Minho University. He has been working professionally in the construction and customization of replaying equipment of obsolete audio carriers. He is developing a PhD investigation in the Instituto de Etnomusicologia –Lisbon– developing advanced physical models of gramophones for archival and musicological use.

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