Electroacoustic preservation projects: how to move forward

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Projects are emerging that reflect the growing concern with preservation and access to our electroacoustic heritage. In today's context it is difficult to find the huge financial means needed to facilitate a durable and efficient response to this problem. Some accessible objectives and projects are presented here which could be developed by the electroacoustic community. For a long time people have been concerned about the importance of the electroacoustic domain; the concern should now include the urgency of preservation.

1. PAST AND PRESENT OF PRESERVATION

1.1. The origins

Electroacoustic music was born within radio. It was built within the production models of radio programmes, originally using the same technology and methods. However, radio as well as television deal with contingency, with everyday facts and social thought; these media are mirrors of society and of an epoch, and thus have become a major factor for the comprehension and the study of our time. *Musique concrète*, which was at the origin of the vast domain that we call electroacoustics today, used radio technology and methods to build artistic works, so as to place its action closer to the high regions of creation and transcend the local contingencies. The famous *Étude aux chemins de fer*, composed by Pierre Schaeffer in 1948, remains a major historical classic, even if its procedural origins are almost indistinguishable from a radio programme. Out of this close relationship the GRM[1] was born, its activity definitively oriented towards music, be it with a strong attachment to the audiovisual world.

Humanity has continuously gathered results of its activity in the past; what were considered the best objects of human production were and are still conserved in museums or libraries (generally with an economical value associated to its artistic or artisanship value). The remaining exponents of human production slowly faded away and were either conserved by accident or eventually inscribed on other works, as paintings, which permits us today to reconstruct the way of life of other past societies. This tendency to bring together outstanding objects or productions developed the concept of 'collection', which is a coherent accumulation of a selection of objects or contents which have a potential intellectual, artistic or economical value. In opposition to this approach, the concept of 'conservation' slowly emerged in the last centuries, underlying the importance of keeping for the future the most complete descriptions and products of our society; without any selection, due to our incapacity to determine the potential value of what we conserve through our present-day conceptions and views.

The 'collection' approach has always existed, but the increasing importance of the economical potential value of collections has somehow exacerbated this tendency. Conservation, on the other hand, in its more systematic approach, is a quite recent phenomenon, which is developing at an incredible speed mainly around content conservation. It has been greatly enhanced by mass storage increasing capacities, which permit us to foresee long-time conservation without content loss. In Europe, conservation is mainly undertaken by institutions, where National Archives and National Libraries have launched the concept of an integral conservation of all the products published in a given domain as well as the record of administration's activity.

The arrival of new media such as radio and television brought new conservation problems that were only understood a long time after the development of these media, that is, once there was a critical mass of elements that needed to be organised, protected and archived. In fact, the first sound media, such as wax cylinders and shellac records, were probably amongst the more lasting media ever conceived because, except for their extreme fragility through manipulation and use, they have proved to be very time resistant; many of them are still playable today. Magnetic tapes brought new manipulation and quality advantages, less degradation through use and an improved recording duration. They radically changed the technology and methods for radio production. Tape was also less fragile and more resistant to stress, which contributed to developing the idea that it was a practically eternal

[1]Groupe de Recherches Musicales (Musical Research Group).

Organised Sound **9**(1): 55–62 © 2004 Cambridge University Press. Printed in the United Kingdom. DOI: 10.1017/S1355771804000081

https://doi.org/10.1017/S1355771804000081 Published online by Cambridge University Press

medium. Alas, chemical processes slowly attacked its durability, mainly the vinegar syndrome that slowly decays the medium until it becomes unreadable.

The arrival of magnetic tape coincides with the beginning of electroacoustic music.[2] Even if the first works by Schaeffer in 1948 and the *Symphonie pour un homme seul* by Schaeffer and Henry in 1951 were composed on shellac records, tape quickly replaced and enlarged the musical possibilities of the studio. These first works were quickly 'preserved' by transferring them to magnetic tape, for conservation and concert purposes (the first version of the Symphony was played on three minute-long records, for a total duration for the first version of 46'! This implied that a technician was constantly changing and sometimes overlapping records on two machines) (Schaeffer 1952: 108).

From this point onwards the long history of electroacoustic music with its technological evolutions, concepts and forms commences. Several thousands of hours of music exist today; they constitute a new domain that has changed the conception and the construction of music. Electroacoustics offers musicians the possibility to build music sound by sound, and mainly to invent their own sounds. This incredible new possibility of making music has led to large-scale experimentation dealing with technology, artistic approaches, concert situations, and musical thought. Music was no more as it was before and musicians had to learn new ways, new techniques, new methods. This heritage is now in danger. If nothing is done, large amounts of musical works will little by little disappear, fade out as analogue and even digital tapes that are not preserved will lose there contents. This is why strong preservation actions are needed to conserve a unique heritage.

1.2. The preservation of audiovisual media

In France, in what concerns particularly the audiovisual domain, archives are conserved within the National Audiovisual Institute (Ina), which has two preservation missions:

(1) Conserving, preserving and restoring all that is in relation with public broadcasting since the beginnings of radio and television, for professional uses.
(2) The Audiovisual Legal Deposit of all that is broadcast on the airwaves and by cable since 1992, which is collected for research purposes and accessible in the National Library through a specially created entity, the Inathèque.

[2]The more generic term of 'electroacoustics' is used here, even if the term has been used only since the 1960s, in order to describe the different musical currents born at the middle of the century: *musique concrète*, *electronic music*, *musiques expérimentales*, and so on.

Ina not also keeps the memory of the nation, but organises the collection of all that is produced to guarantee access for future generations. Recently, collection activity is being investigated on the Internet to study the necessary conditions for a Legal Deposit of the Net.

The GRM (which is a department of Ina) has worked on conservation problems since well before the existence of the Ina (Ina was created in 1975, the GRM in 1958). The conservation of the audiovisual musical heritage that was being produced within the Group was a central concern since it implied a completely new process. There was a new relationship between the composer and the result of his work, which was now fixed on a medium in a definite form containing all his intentions and not subject to an interpretation. However, the fact of working on new media that were subject to decay, that would lose information through use and time, conferred to *musique concrète* a new kind of fragility that implied new conservation methods completely unknown to the traditional guardians of music contents, publishers and librarians.

At the beginning of the 1960s, the first 'Phonothèque' was constituted. The name was changed to 'Acousmathèque' in 1992 to enhance the fact that the conserved objects had the intrinsic value of works-of-art, where musical content and sound content must be preserved in the best possible way. The loss of sound information may have a crucial influence on musical perception. The concept of Acousmathèque implied not only the conservation of the deposited works, but also the organisation of all the related documents to the work and the composer (scores, photos, press information, programmes). Parallel to this there was intense activity of what might be called 'memory fabrication', producing filmed and recorded interviews with composers and performers, documenting complementary information about their thoughts and procedures.

François Bayle was the inventor of the concept of Acousmathèque. It was he who gave the GRM the necessary impulse to develop activities including conservation, developing a large CD collection, organising public conferences and listening events to explain and make available the history and works of the GRM.

An important evolution commenced in 1999 when the Ina launched a very ambitious Preservation and Digitisation plan for the conservation of its archives (Binoche 1999). Preservation is the action necessary to preserve an audiovisual content. Before the digital era it consisted of copying old media onto new media. Today it means converting an analogue medium into a digital format, which will have to be copied again within some time, in order to guarantee its preservation. Digitisation is the action that transfers a medium (of analogue or digital origin) to a digital file format

https://doi.org/10.1017/S1355771804000081 Published online by Cambridge University Press

making it digitally accessible independently of a particular medium. It opens the possibility to access all contents, which are organised and indexed. Digitised material is preserved through migration, which is the action (often automated) of copying a digital file after a period of time in order to avoid degradation. The result of a preservation plan in the audio domain is generally a collection of CDs; the result of a digitisation generally takes place on a server. These two terms are often confused; the fact that data is available in a digital form as on a CD does not mean that a digitisation of contents has been effected.

The Preservation and Digitisation plan meant that a long-term project came into existence in order to preserve Ina's archives (900,000 hours of radio archives, 550,000 hours of television archives). At the same time, the digitisation was launched in order to render the contents accessible online, at broadcast quality utilising a browsing definition. The Preservation plan was far more complicated to organise since it meant dealing with more than twenty different formats on different media such as shellac records, audio tapes, video and film. In a large archive, it is indispensable to associate both plans, since the preservation will permit contents to last the necessary time for digitisation (Ina's plan extends through fifteen years at least) and the digitisation storage options may not have the quality definition necessary to digitise images.

Under this impulse, the GRM began a preservation activity in order to transfer its musical archives to a high definition digital audio format (96 kHz, 24 bit). Five different analogue formats were present; stereo was the most usual one. The archives represent 1,500 works with a global duration estimated at 350 hours, many of which were of digital origin. Therefore, in fact this is a small collection compared with the huge collection of Ina. Once the preservation was completed, contents began to be digitised and stored on a server called 'Acousmalina' for internal use and research studies, containing the digitised music and, little by little, all the related documentation.

1.3. Concerns with preservation and indexing

The first years of electroacoustic music took place without regard to the future. All had to be discovered; technology was always improving and conservation issues were not at all considered to be crucial. It must be kept in mind that magnetic tape was a completely new medium that radically improved the sound quality and the way sound was manipulated. This new revolutionary medium was deemed to last, and it did last for a long period, since we are still capable of playing back a large amount of it. There were not so many works anyway and conservation as a general issue was not yet crucial even for radio holdings.

When the first electroacoustic works were composed (concrete or electronic), they radically changed the way music was transmitted or preserved. Yet this fact was of secondary importance to composers and listeners, more impressed with the possibility of using new sounds and finding new combinations. In fact, music was being written on a new medium, magnetic tape, which was considered as a new kind of 'paper' with a similar exploration of time. Magnetic tape was a good representation of time and did not change the concept of reading on paper much: thought was materialised on an object, with a beginning and an end and an oriented time arrow. Its conservation was somehow considered to be a similar problem to paper conservation.

It was only at the beginning of the 1960s that the first concerns with the past developed. In 1962, a first Catalogue of Experimental Music was compiled by the GRM within the recently created Audiovisual Research Service by Pierre Schaeffer (RTF 1962). It was based on the experience of the GRM and proposed several new research groups on Images, Technology and Theory. This publication listed the 'outstanding' works composed in the world since 1948. Five hundred works were thus selected and presented as well as descriptions of studios and facilities. Five years later, in 1967, the project was taken a step further by Hugh Davies who compiled the first complete catalogue of works called the 'International Electronic Music Catalogue' (Davies 1967). The result was a compilation of five thousand works from 117 countries as well as complementary information including studio addresses, equipment and discography. He also defined descriptors permitting the classification of works in categories and giving technical information about the format, duration and destination. This catalogue was the first large-scale attempt to identify the amount of existing works. It is interesting to remark that, as Hugh Davies comments, '. . . nearly 5,000 compositions actually listed, the notes indicate the existence of some 2,500 more', which means not only that there is some uncertainty but that many works are no longer accessible because the structures in which they were composed do not exist any more.

1.4. Music becomes digital

During the same period that this compilation was being prepared, a new trend was emerging in the electroacoustic domain through the capacity of synthesising sound through computers.

The arrival of digital sounds in music somehow reinforced the idea that media were eternal. The fact that a digital signal was in theory less subject to time degradation, developed the concept that digital description could last much longer and that, through the emerging concept of 'migration', a solution to the

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decay of magnetic tapes could be easily imagined. In fact, digital sound brought new problems with it as is still the case currently, namely the quick changing of media and formats in a continuously evolving technology environment. Many archive owners are more worried about preserving DATs than analogue tapes, which are much less mechanically fragile.

The digital evolution also brought a new concept: now that digital preservation was possible, analogue contents were no longer in danger, because 'some day' all the analogue tapes would be efficiently and eternally transferred. There was confidence in the future and less consciousness of the present problems, while waiting for the perfect digital medium and format that would guarantee long duration. Thus the problem of conservation was put aside; some problems were encountered here and there but they were local problems that did not affect the general approach.

No major action was undertaken until the end of the 1980s on the double basis that analogue magnetic tape would last for a long time (the estimation was fifty years!) and that digital storage would solve the problem of magnetic decay on analogue tapes once a definite format was chosen.

1.5. The first serious concerns with preservation

Independent preservation solutions were sought in different places, yet many centres and institutions were not aware of preservation problems mainly because they were doing research activities which were more aimed towards the future than to the past. It was more clear for radio institutions which were dealing with the conservation of their large body of productions and thus with a certain consciousness of danger and developing adapted archiving methodologies. The GRM within Radio France until the mid-1970s and Ina since, and the RAI or the WDR for example, began archiving and copying quite early in their existence. Some collections were organised and archived properly, others were kept piled up in rooms or basements. In any case the thought was that there would always be time in the future for classifying activities and transfer to other formats. (An important part of the GRM production output in the 1950s was found in 1963 in the basement of the Rue de l'Université, where the first *musique concrète* studio was located, when the studio moved to a new location!)

Preservation initiatives have been generally associated with emerging problems such as the difficulty to read a tape or the loss of contents. In the last ten years, several problems have modified the perception of preservation:

(1) *Precise technical problems have been identified and studied concerning magnetic tapes*. This concerns mainly the 'vinegar syndrome' which slowly modifies the chemical composition of the tapes until they are unreadable. The process depends on conservation conditions (temperature and humidity) and the rate of evolution can be determined. A life expectation can be calculated depending on the state of the process. (http://www.nfsa.gov.au/glossary.nsf/Pages/Vinegar+Syndrome?OpenDocument)

(2) *The definitive digital storage medium and format have not yet been found*. Even if there is a large consensus on the use of CDs and 44.1 kHz, 16 bit definition, studies have also proved that the longevity of a CD (which also depends on storage conditions, mainly light exposure) is between ten and fifteen years for good-quality CDs, and can be less for low-quality ones. CDs are fragile and their handling is rather clumsy. Few institutions or composers have preserved their works on digital media.

(3) *Composers and institutions are disappearing*. Most of the composers that made electroacoustic music are still alive, but many are not. Uncertainty concerning the destination of their works as well as the loss of the documentation and their testimonies represents an important danger for the future. The same phenomenon is taking place within studios and institutions which are tending to disappear at a very high rate due to the development of personal studios and lack of support.

(4) *Technology has not simplified preservation*. Even if better and better storage media exist, as well as more internationally accepted standards, digital description has complicated the choice and the stability of media. Short-lived standards or technically delicate storage devices have often brought more problems than solutions.

(5) *Deciding how to preserve and digitise is the main problem*. Technical choices are difficult to make due to the large number of possible solutions. Investments are important in the domain and most archive owners do not have the know-how to handle digital assets.

1.6. Two major initiatives: Ideama and Dokumenta

The first global action to identify and preserve the heritage of electroacoustic history was launched in 1988 by Max Mathews, Johannes Goebel and Patte Wood at CCRMA in Stanford. In 1990, CCRMA and the recently created ZKM in Karlsruhe, formed an association to initiate the Ideama project that defined a Target collection of endangered works, which should be preserved and made accessible. Several other institutions participated to this project and defined the outstanding works composed since the beginning of technology-oriented music (thus before 1948) until 1970. The project identified a set of 708 works, out of which no information was available for 138 of them!

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Once the collection was identified, it was preserved in digital format (CD) and made available freely to all the institutions participating in the project and could be purchased by all institutions or individuals desiring to obtain it. This major project brought together what were considered the outstanding works of electroacoustic history; it favoured the 'collection' approach to the problem but made works available to a large number of listeners that otherwise were naccessible. (http://on1.zkm.de/zkm/e/institute/mediathek/IDEAMA)

Access is probably the great success of the Ideama project. One of the great advantages of electroacoustic music is that the medium on which it exists is the work itself and not a description as in a score, but this advantage completely stopped the circulation of works, because having a copy of the work meant having the equivalent of the work. The audiovisual approach to protection prevailed in the first decades of electroacoustic music, and prevails today to some extent since it is very easy to obtain copies of published text, but almost impossible to obtain any audiovisual copy except by purchase (if published) or by copying the work when it is broadcast.

The Ideama project coincides with the development of the CD as a music-publishing format, and the fact that finally there was a disc which could transmit recorded music to a high-quality definition standard. Many vinyl records had been published in the past, but this was expensive and the sound quality was far inferior to the actual sound quality of the original music. Even considering vinyl publishing, a very small amount of the electroacoustic domain could be heard, and most of the historical works, which were beginning to interest musicologists and the audience in general, were unavailable. Ideama made the past available, and all the mythical works that were referenced in most books were finally available. With time, the development of CD publishing greatly increased the number of available works; a compilation of published CDs was made in 1998 by Annette Vande Gorne in Belgium, which identifies 750 commercial CDs presenting 3500 musical works! (Vande Gorne 1998).

Golo Föllmer, Roland Frank and Folkmar Hein at the Technische Universität in Berlin initiated another major project in 1990. This project, named 'Documentation Elektroakustischer Musik in Europa', was the first attempt to build an inventory of all the existing works in the electroacoustic domain. Contact was made with all the existing centres and studios in Europe and a catalogue of works was published in 1992, using the same descriptors used by Hugh Davies in the 1967 catalogue. After that first publication, the catalogue was constantly updated and available on the Web, so that any composer could introduce his works, modify the information concerning him and add new works. The database has increased to the extraordinary number of 23,000 entries from all around the world and keeps on growing (Föllmer, Frank and Hein 1992).

These two projects, Ideama and Dokumenta, represent essential initiatives corresponding to two aspects of preservation: identifying the contents, and building a preservation plan for a part of the collection. They show how collaborative projects may bring solutions, even if partial, which show the way for future collaborations.

2. BUILDING SOLUTIONS FOR THE FUTURE

2.1. Identifying the problems

In dealing with launching initiatives for the preservation of electroacoustic music, some major guidelines have to be followed:

- *Before launching an action, it is essential to identify the task*. Preserving without knowing what to preserve is a major problem; a complete inventory has to be made of what exists. The Dokumenta database, for example, is an excellent starting point.
- *Precise descriptors are needed in order to measure the importance of the task*. The descriptors in the Dokumenta database are music oriented and not preservation oriented. It is important to associate conservation descriptors to the works so as to know in what conditions the work has been conserved, what is its format, even information on the tape brand or the year, which may be crucial to organise a preservation plan.
- *What is the redundancy within collections?* As it may turn out that the same work is available in different places, the best version should be chosen; many works may already be preserved or even digitised in different institutions.
- *Clarify the situation in the institution in relation to their collections.* Many research centres and institutions have built collections of the works composed or performed in the institution. What is the legal relation between the institution and the composer? Does the institution have the right to carry out any kind of preservation or publication of the work?
- *Should everything be preserved?* An archivist normally does not ask this major question. Conserving means keeping everything in the best condition for the future. To choose is to have a partial vision on what you are conserving and deciding that some works merit better treatment than others. However, priority has to be organised so as to preserve the most endangered collections or parts of collections. It may also be the case that

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time or finances will constrain the archivist's choices. This is why a clear vision of redundancies can greatly help the issues.

- *What is the size of the domain?* The Dokumenta project has identified more than 23,000 works from all over the world. It is difficult to say what percentage of all the existing works are present in this catalogue, but it is easily imaginable that more than fifty per cent are there. How many hours do these number of works represent? If a mean value of twenty minutes per work is chosen, this represents 8,000 hours. If we suppose that the catalogue contains only fifty per cent of the total or less, the total number of hours would come to 20,000. This amount is a drop in the ocean compared with the sound holdings of Ina (900,000 hours). However, it is still a huge amount of material, and digitising the whole would need considerable amounts of financial support and human intervention.
- *What is considered to be electroacoustic music?* This major question determines the boundaries of the domain. These boundaries are not fixed and are moving all the time since no definite and exclusive definition exists of 'electroacoustic'. It is mainly because composers declare that they are making electroacoustic music that the boundaries are defined. Even through this approach, what has to be preserved? It is easy to identify recorded media, with sounds or music, but should programs, or synthesizer patches or processing methods be preserved? And what about machines and software codes? It is difficult to answer precisely, but if there should be an attempt to preserve the electroacoustic domain, a maximum of elements should be preserved by physical preservation or description (describing precisely what a machine was doing instead of keeping the machine).
- *What is the urgency?* The urgency is greater than anybody can imagine. Analogue tapes are degrading at an incredibly fast rate. Reading material will no more be available in a few years, many machines are no longer constructed or maintained and for some formats it is practically impossible to find players. The same situation is true of digital-born material; not only do they suffer from magnetic degradation of the recording media, but the players often have mechanical problems that make playback impossible. The same problem of machine obsolescence appears here.

These guidelines are essential to build a rational preservation and digitisation plan. It is important to have a vision of the problem as a whole, in order simplify and organise the way to deal with the solutions.

2.2. The situation in France

During the second half of 2003, a study was commissioned to researcher Jean-Loup Graton to enquire into the state of electroacoustic preservation in France (Graton 1993). The objective was to identify collections, their volume and state of degradation, as well as existing preservation initiatives.

Twenty centres were contacted, some never replied, but the majority that answered permitted an extrapolation of the volume of music and its state of conservation. A volume of 3,000 hours was estimated of which between fifty and seventy per cent are on digital media (CD mainly). This vision is probably partial, since contacts were made with institutions which no longer concentrate on electroacoustic production. More and more composers work independently of institutions, have their own studios and eventually come into contact with centres and institutions to diffuse or publish their music.

This study gives a quite approximate evaluation of the volume of hours of electroacoustic music in France, representing five to six thousand works.

2.3. Three major questions

If we were to imagine the launch of a European or international preservation project, three main questions or obstacles appear that may influence whatever could be done in the domain. The first question concerns the relationship between institutions and composers: If ever there was a major preservation plan, would the institutions represent composers? Do they have the right to preserve works? Except for some rare cases, the situation is far from being clear. Institutions have often been involved at the origin of a composition and keep a copy for their records, but no clear contract was ever signed describing their rights and obligations. So institutions should mainly be considered as relays to obtain and diffuse information, but preservation and storage authorisations probably have to be negotiated directly with composers.

A second question appears concerning access; digitisation and access are closely related because digitisation makes the contents available, but under which conditions can access be organised? It is difficult to imagine that electroacoustic music could generate a business plan through pay-per-listen access! It is a rich and original domain but is mainly unknown to the public; in fact one of the objectives of access is to develop interest in electroacoustic music. Access has to be organised in such a way that composers feel that their works are preserved, protected and accessible at the same time, and not in danger of being copied or misused.

The last major question is how to finance a large preservation project? The reason why electroacoustic

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music has been so widely diffused and is so successful is mainly that its cost has never been immense. Composers of electroacoustic music have never become rich; the greater majority barely survive financially or are involved in other activities that finance their composition work. There is no possibility of hitting the jack-pot! This guarantees the large autonomy and freedom in composition that has existed since the early days. When it comes to finding support to launch preservation plans, it is evidently not easy to find such sources through business or marketing; however, electroacoustic music is a major component of our cultural heritage and should interest all national preservation initiatives, at least in Europe.

2.4. A first local solution proposal

As we have seen, a principal obstacle is how to make contents accessible in such a way as to promote the richness of the domain without distributing it freely in all directions. A solution could consist in depositing digitised contents in places in which the contents would be securely accessible for research, study or listening. Such places are libraries of a new kind, which can deal with servers, databases, listening devices and annotation tools.

An example of this kind of library is found in France, within the National Library, through a specialised consultation space called the Inathèque (created by Ina) in which the recordings of radio and television can be consulted, as well as the associated paper documents. This site is dedicated to researchers, allowing them to access audiovisual recordings and to study and compare all that has been broadcast via the airwaves or on cable in France.

It could easily be proposed that composers and institutions deposit their works voluntarily into this digital library. This initiative would make electroacoustic music available for research, with associated documentation, a Thesaurus and annotation tools. Works would be protected from piracy and concentrated in one place for preservation and migration. The advantages of such a solution are (i) the fact that, little by little, the collection would grow and bring new interest, and (ii) that works would be deposited in a central and neutral institution dedicated to the preservation of recordings. The disadvantages are that (i) the works would be concentrated in one geographical place, and hence be difficult to approach in a world in which users are more and more accustomed to distant explorations, and (ii) access would be restricted to researchers and not available to the general public.

But this situation is probably a temporary one. Internet protection rights evolve, and security in the transactions will open doors that permit access to hidden, protected information in the coming years. We should not wait until this is in place. We should begin immediately building the collections that in the future will be accessible from any place in the world and protected as authors desire.

2.5. Actions should be more ambitious

How could an initiative be enlarged to European or world scale? The examples previously described show the continuous interest through the last five decades for conservation, preservation and identification of the electroacoustic domain. Any new initiative cannot ignore what has been done and should improve what already exists, and include today's technology and documentation advances. There is urgency, but it has to be organised; money is needed but clear actions have to be identified in order to obtain it. Work has still to be done before action is undertaken.

An initiative is underway which intends to establish guidelines and organise future activities. No official committee or association has been formally established, only the intention of co-operation between persons from institutions concerned with electroacoustics and preservation. A first discussion group is being constituted between De Montfort University in Leicester, ZKM in Karlsruhe, and GRM in Paris to clarify the state-of-the-art, to identify actions and to launch projects whenever a clear possible action is identified. This group is evaluating the situation, before constituting a more formalised group, and inviting centres, institutions and groups that have been involved with preservation or cataloguing initiatives in the past to join them.

The first objective is to identify electroacoustic works that constitute the domain as well as discuss the specific needs of preservation. The experience of the Technische Universität in Berlin is essential for this action and a close collaboration with the team has to be established. However, cataloguing should be strongly oriented towards identifying the state of the works and not only the contents, so as to draw a cartography of the endangered collections and to formally describe the urgency of needed preservation actions.

The second objective is to launch concentrated projects on identified endangered collections. This means finding support through European or national programmes to preserve collections facing rapid degradation. The mission of the group would be to foster these initiatives and become little by little a point of reference where content holders can find information, orientation and collaboration.

The third objective is to advance towards digitisation, bringing preserved contents into a pertinent file format and building local servers for institutions and gradually orienting the action towards building

https://doi.org/10.1017/S1355771804000081 Published online by Cambridge University Press

repositories, i.e. large facilities in which contents are concentrated for conservation and access. The evolution of Internet protection will be crucial for this final stage, in which content will progressively be made available for the largest number of users. At the same time, content will be protected through time.

Digitisation is the gateway to a completely new way of accessing, studying and diffusing music. Bringing contents together permits developing new activities related to collections: exhibitions, regular listening sessions of music or thematic organisation of collections; a large array of actions is possible to diffuse and promote this music domain, which seems inaccessible from a distance but seduces all those that come close to it.

It should be noted that the problem faced by the electroacoustic domain is also shared by other large communities of audiovisual content holders. A recent European project evaluated the number of audiovisual holdings in Europe to consist of 150 million hours! Other large projects are now concerned with developing new technology solutions to reduce the cost and accelerate and enhance preservation. Preserving the electroacoustic domain could become a major model for addressing localised and reduced collections.

In 2002, Yann Geslin, a researcher at the GRM, contacted the major historical European studios of electroacoustic music that are still in existence, in an informal approach to measure concern about preservation and digitisation. Twenty institutions were contacted, all eager to collaborate in preservation actions, some of them already with a digitisation programme completed. It is more and more difficult for institutions to exist in the electroacoustic domain and even more to keep their heritage; a global approach to the problem is welcome and considered necessary.

3. THE NECESSITY OF PRESERVATION

Why should we preserve? This is the final question, as important as all the others since the reasons may be clear to us who know the domain, but difficult to explain to others who may support our project. Different considerations intervene in defining the reasons for conserving this domain:

- The most evident reason is historical interest; it constitutes human artistic production and as such should be kept for future generations.
- Electroacoustics is one of the major human technological revolutions, as important as the appearance of musical writing. It completely changed the way music was conceived and composed.
- The electroacoustic domain was a pioneer in the use of technology for artistic creation. Composers have been the great technology 'enhancers'; by using it and by encouraging and often participating to its evolution they have contributed to the development of the major concepts, practices and tools now used all over the world.
- Electroacoustics was the first application of computing for creation. It has thus contributed to the development of computing models and processes in an innovative way.
- It is one of the most active domains in non-commercial musical activities. It continues to grow and has influenced and oriented new domains such as techno and electronic music.
- Finally, some of the major works of the twentieth century have been produced in the domain. It has opened its doors to all composers, academic and self-made, and has given to musical creation a new perspective, new goals and new publics.

Even if the task of preserving electroacoustic music seems immense, it is affordable. The size of the collection is not huge, and the necessary means attainable through concerted actions and initiatives. There is an identified necessity to explore and study this domain; musical analysis is just beginning to explore its possibilities and even artificial intelligence and content retrieval researchers find in this domain a unique field to experiment with and develop new theories.

We live in a unique time, one in which we should stop carrying the weight of the past on our shoulders and push forwards, towards the future. What motivates this impulse are historical reasons, societal necessities, and just the pleasure of listening to music.

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https://doi.org/10.1017/S1355771804000081 Published online by Cambridge University Press